Impact of the COVID-19 Pandemic on the Mental Health of Users with Mental Illness of Home Visit Nursing Services in Japan

Toyohiko Kodama* and Sachiko Takaki

School of Health Sciences, University of Occupational and Environmental Health, Japan. Yahatanishi-ku, Kitakyushu 807-8555, Japan

Abstract: This study aims to clarify the impact of COVID-19 on the mental health of users with mental illness of home visit nursing services. We sent a questionnaire to 1,740 home visit nursing station managers, 374 (21.5%) of whom responded. The total number of valid responses was 328, which amounted to 87.7% of the returned surveys. In total, 103 (31.4%) stations reported that their users’ mental health deteriorated owing to the spread of COVID-19. Eighty-nine (86.4%) stations reported that their users’ anxiety increased. More than 80% of the stations explained infection control measures to their users, but 194 (59.1%) stations answered that their users found it challenging to practice cleanliness. A total of 207 (63.1%) stations answered that the promotion of strategies for coping with stress is necessary for their users. Users with mental illness are vulnerable to stress and have a higher risk of death due to COVID-19. Thus, they should be carefully observed and referred to facilities if required. Home visit nursing staff have an important role to play in the preservation of the well-being of their users with mental illness during the COVID-19 pandemic.

Keywords: COVID-19, home visit nursing, mental health, infection control, stress coping.

Introduction

The emergence of COVID-19 was first reported in 2019, and the outbreak has since developed into a global pandemic. As of September 29, 2021, over 230 million people have suffered from COVID-19, and over 4 million people have died as a result [1]. The pandemic has induced immense anxiety and fear worldwide and has had a profound impact on the lives and health of individuals. People have been forced to avoid physical contact, practice thorough disinfection, and limit their work- and education-related activities. Many people have experienced intense stress as a result, which has negatively impacted their mental health. Consequently, a global increase in the rate of anxiety and depression was reported in 2020 [2].

People with mental illness are especially vulnerable to stress, and their mental health is at a high risk of deteriorating. Obsessive-compulsive disorder patients, for example, are concerned because COVID-19 worsens compulsive symptoms [3]. Substance-dependent patients are at increased risk of symptomatic worsening due to stress and treatment interruptions caused by the pandemic lockdown [4]. In addition to the deterioration of individuals’ mental health due to anxiety and stress, there is a risk that they will refrain from visiting medical facilities or interrupt their treatment in order to avoid getting infected [5, 6]. A previous

*Corresponding Author: Toyohiko Kodama, School of Health Sciences, University of Occupational and Environmental Health, Japan. 1-1 Iseigaoka, Yahatanishi-ku, Kitakyushu 807-8555, Japan, Tel: +81-93-603-1611, Fax: +81-93-691-7183, E-mail: t-kodama@health.uoeh-u.ac.jp
study showed that 67.8% of people with mental illness living in a community had a history of interruption of psychiatric treatment [6].

Home visit nursing services play a major role in the continuity of treatment for people with mental illness living in a community [7]. Home visit nursing stations monitor symptoms and provide medication support and information on social services to help patients live stably in the community [7]. Many mentally ill people in Japan use home visit nursing services, and the number of home nursing service users is rising. There were 48,830 users of all home visit nursing services in 2001, and this number increased to 228,390 as of 2017. Approximately one third (34.7%) of the users suffer from mental illnesses [8]. There are concerns about the impact of the COVID-19 pandemic on those who utilize psychiatric home visit nursing services, as they may refuse to allow nursing staff to visit their homes due to fear of infection, which may lead to worsening symptoms [5]. Users can not utilize day-care facilities or community activity support centers as usual owing to pandemic-related restrictions [5]. Their daily routines are disrupted and interpersonal interactions reduced [5]. Unlike hospitalized patients, users of psychiatric home visit nursing do not always have healthcare workers nearby [9], so detection of their potentially worsening symptoms might be delayed. It is necessary to understand the impact of COVID-19 on the lives of users to provide them with effective care.

Previous studies have reported that people’s mental health deteriorated early in the COVID-19 pandemic in Japan [10], but no studies have explored how exactly the pandemic has impacted mentally ill home nursing service users. Similarly, no studies have examined the care and support provided to users whose mental health deteriorated due to the COVID-19 pandemic. In order to provide more effective care and support in the future, it is necessary to examine the content of the care and support that staff have provided and the issues they have encountered.

People’s distress was highest during the periods when COVID-19 deaths were skyrocketing and when strict measures to limit its transmission were being implemented [2]. Therefore, we focused on the impact of the COVID-19 pandemic on the mental health of users of home visit nursing services, who suffer from mental illness, after a state of emergency was declared in Japan in January 2021. This study aims to investigate the impact of the COVID-19 pandemic on the mental health of users with mental illness of home visit nursing services, the content of the care and support provided by home visit nursing services staff, and what additional support might be needed for users to cope with the COVID-19 pandemic. In order to do so, we asked home visit nursing station managers about the impact of the COVID-19 pandemic on their users with mental illness and queried the details of the care provided to such users.

**Materials and Methods**

**Design and sample**

We assembled a list of home visit nursing stations across all prefectures in Japan using prefectural websites and selected designated medical payment institutes for services and support for persons with disabilities (a system to reduce medical costs for people with mental disabilities). We accessed the prefectural official websites and obtained the lists uploaded therein. We determined the number of questionnaires to be distributed based on the population size of the prefecture and randomly selected 1,740 home visit nursing stations. Since some users with mental illness are not able to express themselves well to others, we administered questionnaires to the managers of the selected home visit nursing stations. A home visit nursing station manager is a healthcare professional who has a nursing license.

We designed a questionnaire to investigate the impact of the COVID-19 pandemic on the mental health of users of home visit nursing services, the care provided by home visit nursing services staff to users with mental illness, and the support that may be needed for users to cope with the COVID-19 pandemic. We asked about the number of users with mental illness who experienced a deterioration in their mental status after the declaration of a state of emergency in January 2021 due the COVID-19 outbreak, their diagnosis, and the details of the deterioration of their mental health. We made choices based on information from a specialist on psychiatric nursing and referred to previous studies about details of mental health deterioration...
We asked about the difficulties experienced by users with mental illness and nursing staff during the COVID-19 pandemic to understand the impact of infections on the operations of home visit nursing.

We decided the content of choice with a specialist on psychiatric nursing in reference to previous studies [5, 12]. We also examined the content of the care and support provided to users during the COVID-19 pandemic. We use the term “care” in the present study to refer to care provided directly to the users, and “support” to refer to care that includes indirect support. We included providing of information and explanations as a part of care in this study, because information and explanations were reported as care in previous studies and reports [13–15]. In the present study, a user with mental illness is defined as someone suffering from mental disorders such as schizophrenia, depression, and diseases that cause such disorders, like dementia and Huntington’s disease.

The content of the questionnaire queried the following information:

1) Number of employees.

2) Total number of registered users per month.

3) If any users with mental illness experienced a deterioration in their mental status after the declaration of a state of emergency in January 2021. If yes, what was the total number of users who experienced this deterioration, and how many of them were women.

4) Names of the mental illnesses that the users, whose mental health worsened, were diagnosed with.

5) Details of the deterioration of the mental health of users with mental illness due to the spread of COVID-19 (multiple answers allowed).

Options included psychiatric symptoms, sleep, appetite, medication, interpersonal relationships, suicide ideation, and admission to a psychiatric hospital.

6) If the staff experienced any difficulties in dealing with the spread of COVID-19 during their home visits for users with mental illness (multiple answers allowed).

Options included infection prevention, income, use of social services, interpersonal relationships, inter-professional work, and use of online tools.

7) Care provided to users in situations where there was a risk of the spread of COVID-19 (multiple answers allowed).

Options included telephone and online support, provision of information on COVID-19 and social services, and explanation of infection control, coping with stress and how to adjust interpersonal relationships.

8) Care and support necessary for users to cope with the COVID-19 pandemic (multiple answers allowed).

Options included utilization of information and communication technology, economic assistance, inter-professional work, and strategies for coping with stress.

We sent the questionnaires to managers of home visit nursing stations on June 11, 2021. We set June 30, 2021 as the deadline for responses.

Analyses

We compared the number of staff and the total number of registered users per month, between the group that experienced a deterioration in their mental health and the group that did not, using the Mann-Whitney U test. A P-value of less than 0.05 indicated a significant difference. SPSS version 22 for Windows (Armonk, NY: IBM Corp) was used for statistical analysis.

Ethical considerations

We explained the purpose, method, data protection, disadvantages, and risks of the study on request letters enclosed with the questionnaire. The questionnaire included a checkbox where respondents could mark their consent for participating in the study. We also explained to them that their participation would not disadvantage them in any way and that data from this study would remain anonymous. The participants did not receive any payment for participating in the study. This study was approved by the Ethics Committee of the University of Occupational and Environmental Health (No. 021625).

Results

Out of the 1,740 home-visit nursing station managers who we sent the questionnaire to, 374 responded (21.5%). We excluded data with missing values, after which 328 responses were considered valid (87.7% of
the returned surveys). The average number of nursing station staff was 9.2 (SD: 7.5), and the stations had an average of 80.8 (SD: 71.2) registered users a month. Table 1 shows the characteristics of the users with mental illness whose mental health deteriorated. In total, 103 (31.4%) stations reported that the mental health of their users with mental illness deteriorated owing to the COVID-19 pandemic. The lowest number of users with mental illness reported was 1, the largest number was 18, and the average number was 3.01 (SD: 3.48). We summed up the number of users with mental illness that deteriorated owing to the COVID-19 pandemic by nursing stations, and found a total of 310, of which 182 (58.7%) were women.

Table 2 shows the diagnoses of the users with mental illness whose conditions deteriorated. Schizophrenia (110; 35.5%) was the most common, and depression (89; 28.7%) was the second most common mental illnesses among them.

Table 3 shows a comparison of the number of staff and the total number of registered users per month, between the stations whose users experienced a deterioration in their mental health and the stations whose users did not. There were no significant differences between the two groups.

Table 4 presents the manner in which the users’ mental health deteriorated. Eighty-nine stations reported that their users’ anxiety increased. An additional 55 stations reported a rise in their users’ depressive symptoms. There were also reports of users expressing suicidal ideation and being admitted to psychiatric hospitals.

Table 5 shows the COVID-19-related challenges that arose during home-visit nursing work for users with mental illness. Most stations reported that it was difficult for their users to practice cleanliness, such as

| Item                                                                 | n (%)   |
|----------------------------------------------------------------------|---------|
| Stations whose mentally ill users’ mental health deteriorated        | 103 (31.4) |
| The number of users whose mental health deteriorated                 | 310     |
| Number of women among the users whose mental health deteriorated     | 182 (58.7) |

| Diagnosis                                                                 | n (%)   |
|--------------------------------------------------------------------------|---------|
| Schizophrenia                                                            | 110 (35.5) |
| Depression                                                               | 89 (28.7)  |
| Bipolar disorder                                                         | 33 (10.6)  |
| Dependence                                                               | 15 (4.8)   |
| Developmental disorder                                                   | 15 (4.8)   |
| Dementia                                                                 | 12 (3.9)   |

| Stations whose users' mental health did not deteriorate (n = 225)       | Stations whose users' mental health deteriorated (n = 103) | P-value |
|------------------------------------------------------------------------|-------------------------------------------------------------|---------|
| Number of staff                                                        | Median (Interquartile range)                                | Median (Interquartile range)                                | Mann-Whitney U test |
| 7 (5-11)                                                               | 8 (4-12)                                                    | 0.71     |
| Number of registered users per month                                   | 65 (35-102)                                                 | 65 (28-110)                                               | 0.79     |

| Content of state of deterioration                                       | n (%)   |
|------------------------------------------------------------------------|---------|
| Anxiety increased                                                       | 89 (86.4) |
| Depressive state increased                                              | 55 (53.4) |
| State of sleep worsened                                                 | 36 (35.0) |
| Relationships between user and others worsened                          | 25 (24.3) |
| Relationships between users and their family worsened                   | 24 (23.3) |
| Psychiatric symptoms such as hallucination or delusion worsened         | 22 (21.4) |
| User was admitted to a psychiatric hospital                             | 17 (16.5) |
| User’s appetite changed                                                 | 17 (16.5)  |
| User indulged in suicide ideation                                       | 16 (15.5)  |
| Relationships between user and staff worsened                           | 14 (13.6)  |
| User’s medication became difficult to take                              | 11 (10.7)  |
| Other                                                                  | 11 (10.7)  |
by wearing masks and disinfecting their hands (194; 59.1%). A significantly large number of stations also reported that it was difficult for their users to adhere to social distancing protocols (129; 39.3%).

Table 6 shows the type of care provided to the users during the COVID-19 pandemic. Most stations explained infection control measures, such as wearing masks and hand disinfection, to their users (279; 85.1%). More than 50% of the stations reported that they provided information about COVID-19 and explained what to do in case of the emergence of symptoms of infection.

Table 7 illustrates the care and support that may be needed for the users to cope with COVID-19 infection, as indicated by the home-visit nursing station managers. The promotion of strategies for coping with stress (207; 63.1%) and the consolidation of inter-professional work (201; 61.3%) were the two most common responses in this regard.

**Discussion**

The current study explores the impact of the COVID-19 pandemic on the use of home visit nursing services by users with mental illness. Approximately 30% of the stations reported that the mental health of their users with mental illness had deteriorated owing to the COVID-19 pandemic. Most of the users whose mental health deteriorated were diagnosed with schizophrenia. Depression was the second most common diagnosis. This result reflects the proportion of mental illnesses served by home visit nursing services [16].

There was no relationship between the size of the home visit nursing station and the deterioration of users’ mental health. In total, 58.7% of the users with mental illness whose mental health deteriorated were women. Since 57.6% of the home visit nursing users in Japan are women [17], the ratio of males to females in this study is likely to reflect the gender ratio among users nationwide. There appears to be no gender difference in the impact of the COVID-19 pandemic on the mental health of users.
The most commonly reported adverse mental health outcome was an increase in users’ anxiety. A survey of the general public in Japan revealed that more than 60% of respondents experienced anxiety due to the COVID-19 pandemic [18]. The most common reasons for the respondents’ anxiety were the possibility that they and their family would get infected, and the lifestyle changes that they had to undergo during the pandemic [18].

Anxiety is a common symptom of mental illness, with more than half of all patients with schizophrenia and depression having some symptom of anxiety [19-20]. It is possible that users with mental illness felt the same level of anxiety of infection as the general public [5], and this may have made the anxiety symptoms of users with mental illness even worse.

It should be noted that a few stations also reported serious problems, such as their users indulging in suicidal ideation and being admitted to psychiatric hospitals. The number of suicides in Japan in 2020 was 21,081—the first increase in 11 years [21]. This indicates that the COVID-19 pandemic has had a serious impact on people’s mental health. A previous study reported that the number of suicides in Hong Kong increased in 2003 due to the economic impact of the severe acute respiratory syndrome (SARS) epidemic [11]. Mental illness is a risk factor for suicide, and many users with mental illness have low incomes and unstable economic conditions. Therefore, users of home visit nursing services with mental illness should be carefully observed and cared for. It is also important to provide them with access to a variety of social services, including financial support.

Survey results on the difficulties experienced by nursing staff showed that more than half of the stations reported that it was difficult for their users to practice cleanliness. Previous studies have also reported that users with mental illness find it challenging to practice infection control measures [12, 22]. The reasons for this include the inability of those with mental illness to communicate infection symptoms accurately and to obtain an understanding of infection control behaviors [12, 22]. Unlike in hospitals, a health care professional is not always nearby, and it is thus difficult for those with mental illness to persistently practice infection control behaviors at home.

More than 80% of the stations provided information regarding infection control measures to their users. Additionally, more than 50% of the stations provided information about COVID-19 to their users and explained what to do in case they begin to display symptoms of infection. Nevertheless, most stations reported that it was difficult for their users to practice cleanliness. These results demonstrate the serious infection-control-related challenges that users with mental illness face.

A previous study reported that people with mental illness have a higher risk of death due to COVID-19 infection than those who do not suffer from mental illness [22-24]. The reasons for this are thought to be mentally ill peoples’ barriers to somatic care, immune system abnormalities, and various social factors (e.g., family and household composition, socioeconomic status, and environmental factors) [22-25]. Thus, the Ministry of Health, Labor and Welfare placed those with severe mental illness on top of the priority list for COVID-19 vaccinations [26]. Nursing staff should be aware that users with mental illness are at high risk for COVID-19 infection and need to take thorough precautions to prevent them from getting infected. Previous studies reported some effective infection control measures for users with mental illness, such as explaining in writing, not just verbally [27], explaining on a continual basis, not just once [28], and nursing staff bringing disinfectant during visits and washing hands together [29]. The risk of infection among users will decrease if such efforts are spread.

About support that may be needed for users to cope with the COVID-19 pandemic, although over 40% of stations reported that they provided their users with strategies for coping with stress, most stations (63.1%) reported that the promotion of such strategies is the form of support that their users may need the most. This indicates how difficult it is for the users to cope with stress during the COVID-19 pandemic. It is thus important for nursing staff to carefully monitor their users’ stress. If they notice any signs of their users’ stress worsening, they should report it to the users’ doctor as soon as possible so that the treatment plan can be revised accordingly. It would also be necessary to provide users with strategies for coping with stress that can be performed at home, such as stretching and
Impact of the COVID-19 Pandemic on the Mental Health

breathing exercises. We can also introduce high-quality videos on coping with stress that are available on sites, such as YouTube (YouTube, CA). Education of nursing staff by psychology specialists would also be necessary to provide users with more effective strategies for coping with stress. It may be beneficial to instruct users not to consume COVID-19-related news any more than necessary, so as to avoid exacerbating their anxiety.

More than 60% of the stations reported that they needed to strengthen inter-professional work. This was possibly the first time that the staff members faced such a serious health care crisis, and many stations may have struggled to exercise measures to deal with new infections. Ensuring collaboration with infectious disease specialists and sharing information with other stations is thus important.

The present study had some limitations. Although we conducted a nationwide survey of home visit nursing stations, the response rate was low (21.5%), making it difficult to generalize the results. If the mental health of users of home visit nursing worsened, it is probable that the station’s staff assumed that it was due to their inadequate care, and that may have been the reason why they did not respond to the questionnaire. If so, the rate of stations where users’ mental health deteriorated may have been much higher. Our results must be interpreted with caution.

We asked the participants about the deterioration of the mental state of their users with mental illness, but the definition of this deterioration was obscure. Respondents’ subjectivity may have influenced their answers about the worsening of their users’ mental state, even though we provided specific examples of deterioration to maintain objectivity. We might have been able to reduce the influence of respondents’ subjectivity by the use of specific options, such as worsening psychiatric symptoms and worsening state of sleep.

We did not investigate detailed demographics (age, marital status, household composition) of the users whose mental health deteriorated. It may be possible to identify high-risk factors for mental health deterioration by examining user demographics in detail. Once high-risk factors are known, individualized care can be provided based on the risks faced by the users.

Conclusions

The present study clarifies the impact of the COVID-19 pandemic on users of home visit nursing services with mental illness. Most users whose mental health deteriorated during the pandemic were schizophrenic. Most stations reported increased levels of anxiety among their users. This study also showed the serious infection-control-related challenges that users with mental illness face. It was also difficult for such users to cope with stress during the COVID-19 pandemic. The respondents highlighted the urgency of promoting strategies for coping with stress and strengthening inter-professional work in order to support their users.

This study indicates the need for close monitoring and adequate hospital referral of users with mental illness during the COVID-19 pandemic. Home visit nursing staff can perform regular observations and refer users to a facility if necessary. They play an important role in preserving the well-being of users with mental illness during the COVID-19 pandemic. Our findings will be useful for home visit nursing services dealing with users with mental illness. Further investigation that examines the detailed characteristics of users affected by the COVID-19 pandemic is warranted to ensure that such users receive more individualized care.

Acknowledgments

We would like to express our deep gratitude to the home visit nursing staff for their cooperation.

Conflict of Interest

No potential competing interests were reported by the authors.

Funding

This research was funded by a research grant provided by the University of Occupational and Environmental Health, Japan.
Data Availability Statement

Please contact the author for further information on data availability.

References

1. WHO (2020): WHO coronavirus (COVID-19) dashboard. https://covid19.who.int (accessed September 29, 2021)
2. OECD (2021): OECD policy responses to coronavirus (COVID-19): tackling the mental health impact of the COVID-19 crisis: an integrated, whole-of-society response. https://read.oecd-ilibrary.org/view/?ref=1094_1094445-bukuf10cm&title=Tackling-the-mental-health-impact-of-the-COVID-19-crisis-An-integrated-whole-of-society-response&_ga=2.172857515.983928997.1626265528-1303295787.1624963618 (accessed July 1, 2021)
3. Banerjee DD (2020): The other side of COVID-19: impact on obsessive compulsive disorder (OCD) and hoarding. Psychiatry Res 288: 112966
4. Marsden J, Darke S, Hall W et al (2020): Mitigating and learning from the impact of COVID-19 infection on addictive disorders. Addiction 115(6): 1007–1010
5. The Japanese Society of Psychiatry and Neurology, The Japanese Society for Child and Adolescent Psychiatry, Japanese Association for Disaster Medicine, Japanese Society of General Hospital Psychiatry & Japanese Society for Traumatic Stress Studies (2020): Guidelines for mental health under COVID-19 pandemic. 1st ed. (in Japanese). https://www.jspn.or.jp/uploads/uploads/files/activity/COVID-19_20200625r.pdf (accessed September 29, 2021)
6. Yoshioka-Maeda K & Kuroda M (2014): Risk factors for interruption of psychiatric treatment in mentally ill people living in a Japanese community: a cross-sectional study. Asian Pac J Dis Manage 8(1–2): 9–15
7. Japanese Psychiatric Nurses Association (2021): Survey of actual conditions of psychiatric home visit nursing services and role of community comprehensive care system. (in Japanese). http://www.jpna.jp/images/pdf/JPNA_mhlw_R02_report_202103.pdf (accessed September 29, 2021)
8. Ministry of Health, Labour and Welfare (2019): 413th Central Social Insurance Medical Council general meeting; conference material (in Japanese). https://www.mhlw.go.jp/content/12404000/000507982.pdf (accessed July 14, 2021)
9. The National Association for Visiting Nurse Service (2016): A survey of home-visit nursing station providing 24-hour assistance (in Japanese). https://www.zenhokan.or.jp/wp-content/uploads/h27-2.pdf (accessed September 29, 2021)
10. Kikuchi H, Machida M, Nakamura I et al (2020): Changes in psychological distress during the COVID-19 pandemic in Japan: a longitudinal study. J Epidemiol 30(11): 522–528
11. Yip PS, Cheung YT, Chau PH & Law YW (2010): The impact of epidemic outbreak: the case of severe acute respiratory syndrome (SARS) and suicide among older adults in Hong Kong. Crisis 31(2): 86–92
12. Kanesaki M (2019): Difficulties experienced in implementing counteractive measures against infection during influenza outbreak in a closed ward for chronic psychiatric patients (in Japanese except for the abstract). Japanese Journal of Infection Prevention and Control 34(1): 67–72
13. Ministry of Health, Labour and Welfare (2009): About home visit nursing services (in Japanese). https://www.mhlw.go.jp/shingi/2009/04/dl/s0423-7c.pdf (accessed September 29, 2021)
14. Nishikawa S & Fuji C (2018): Interprofessional work in psychiatric home visit nursing. The Japanese Psychiatric Nursing Society 61(2): 13–16 (in Japanese)
15. Kasano J, Takano M & Mizumoto E (2020): Supports of visiting nurse to children with special healthcare needs and their families: a review of the literature. The Journal of Child Health 79(5): 502–509 (in Japanese)
16. Japanese Psychiatric Nurses Association (2021): Survey on the actual status of psychiatric home visit nursing and its role in the Community-based Integrated Care System (in Japanese). http://www.jpna.jp/images/pdf/JPNA_mhlw_R02_report_202103.pdf (accessed August 19, 2021)
17. Ministry of Health, Labour and Welfare (2017): Survey of institutions and establishments for long-term care in 2016 (in Japanese). https://www.mhlw.go.jp/toukei/saikin/kaigo/service16/index.html (accessed August 19, 2021)
18. Ministry of Health, Labour and Welfare (2020): Survey on mental health related to COVID-19 (in Japanese).
Impact of the COVID-19 Pandemic on the Mental Health

https://www.mhlw.go.jp/stf/newpage_15766.html (accessed August 19, 2021)

19. Aikawa S, Kobayashi H, Nemoto T et al (2018): Social anxiety and risk factors in patients with schizophrenia: relationship with duration of untreated psychosis. Psychiatry Res 263: 94–100

20. Japanese Society of Mood Disorders (2016): Treatment Guideline of Japanese Society of Mood Disorders. II. Major Depressive Disorder (in Japanese). https://www.secretariat.ne.jp/jsmd/iinkai/katsudou/data/160731.pdf (accessed October 6, 2021)

21. Ministry of Health, Labour and Welfare Office for Policy of Suicide Prevention (2021): Suicide situation in 2020 (in Japanese). https://www.mhlw.go.jp/content/R2kakutei-01.pdf (accessed August 19, 2021)

22. Rovers JJE, van de Linde LS, Kenters N et al (2020): Why psychiatry is different - challenges and difficulties in managing a nosocomial outbreak of coronavirus disease (COVID-19) in hospital care. Antimicrob Resist Infect Control 9(1): 190

23. Fond G, Nemani K, Etchecopar-Etchart D et al (2021): Association between mental health disorders and mortality among patients with COVID-19 in 7 countries: a systematic review and meta-analysis. JAMA Psychiatry 78(11): 1208–1217

24. Vai B, Mazza MG, Delli Colli C et al (2021): Mental disorders and risk of COVID-19-related mortality, hospitalisation, and intensive care unit admission: a systematic review and meta-analysis. Lancet Psychiatry 8(9): 797–812

25. Karmakar M, Lantz PM & Tipirneni R (2021): Association of social and demographic factors with COVID-19 Incidence and death rates in the US. JAMA Netw Open 4(1): e2036462

26. Ministry of Health, Labour and Welfare (2021): Priority of COVID-19 vaccination. Conference material of 44th Health Sciences Council (in Japanese). https://www.mhlw.go.jp/content/10601000/000755192.pdf (accessed August 14, 2021)

27. Miyazaki S (2021): Infection prevention measures based on interaction with users. The Japanese Journal of Psychiatric Nursing 48(4): 22–25 (in Japanese)

28. Yoshizato M (2021): Experience in Covid-19 ward management in a psychiatric hospital. Journal of the Japanese Nursing Association 73(2): 92–95 (in Japanese)

29. Sasakuma T (2021): Infection control in psychiatric hospitals: do & do not. Infect Control 30(5): 512–515 (in Japanese)

J UOEH 44(2) : 151 – 159 (2022)