

Research article: Psychological stress of healthcare professionals caring for pediatric cancer patients during the outbreak of COVID-19

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Abstract

Background: In response to coronavirus disease 2019 (COVID-19), the psychological distress of health care workers (HCWs) is overwhelming, irrespective of the extent of exposure to infected patients. Infection control and prevention (ICP) measures for mobile children and youths are indispensable to contemplate sustainable public health management, but it is difficult to define the clear trade-offs between ensuring virus-containing strategy and resuming ordinary childcare. Aim: To analyze the occupational distress and dilemma of HCWs working on the pediatric cancer ward as a representative model to conceptualize the core of anxiety at the childcare frontline. Methods: Qualitative and quantitative studies using an empirical phenomenological approach and questionnaire survey from 20 th April to 5 th May 2020. Results: High confidence in the institutional ICP measures is fundamental to maintain a strong social responsibility and resilience of HCWs against the crisis, but they are still under overwhelming anxiety within themselves, particularly about being infected to become an asymptomatic carrier who might pass the virus to patients. Both nursing staff and HCWs with less than 5 years of working experience perceived more intense psychological distress in comparison with physicians. Conclusion: We would like to suggest that target approaches, such as activating interpersonal communication and facilitating ICP adherence, are indispensable to maintain the safety climate among HCWs. Recognizing the psychological distress of childcare HCWs is important to mitigate their occupational distress, but also development of future public health strategy in the era of COVID-19.

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Introduction

Coronavirus disease 2019 (COVID-19) has put the entire health care system under a great deal of turmoil and stress. Several clinical observations have shown the overwhelming psychological burdens on frontline healthcare workers (HCWs) in response to the pandemic [1, 2], but it is also important to address that this worldwide crisis has affected virtually all child healthcare systems, including clinics, schools, nurseries, and day care centers [3]. In future epidemics, coping with community-based viral transmission, especially via mobile children and youths, is indispensable to contemplate sustainable public health management.

In this regard, it is essential to ensure that all public health measures should be in place to halt the spread of the virus and to lessen the psychological burden of not only children and their guardians, but also caretakers. As pediatric cancer care requires many people in enclosed spaces and is often associated with the “Three

Cs”, *i.e.* , working in closed spaces with poor ventilation, crowded places, and close-contact settings [4], it is difficult to define the clear trade-offs between ensuring virus-containing strategy and resuming ordinary childcare. HCWs in our pediatric cancer ward have been well trained for infection prevention and control (IPC) guidelines and have longer healthcare experience with caring for vulnerable children, but still there is a growing concern for the developing workplace dilemma and distress. Because these problems have a strong relevance to public health management as a whole, we undertook an analysis of psychological and occupational distress of HCWs caring for pediatric cancer patients to construct a future perspective of childcare strategy in the era of COVID-19.

Methods

Clinical setting

Since the first COVID-19 patient was confirmed in January 2020 in Japan [5], the disease has spread nationwide, and the Japanese government declared a state of emergency in April [6]. Practically, nearly all Japanese nationals have adhered to basic preventive measures, including general mask wearing, hand washing, and avoiding the above “Three Cs”. Hyogo AGMC is one of the tertiary hospitals dedicated to advanced medical care, including emerging infectious diseases and pediatric cancer. During the early months of the pandemic from March to June, 120 confirmed COVID-19 adult patients were treated in the negative pressure infection ward, with 5 deaths. Two HCWs, *i.e.* , one triage nurse and one medical engineer, though asymptomatic, were found to be infected with the virus. Although their transmission route could not be determined, all personnel who might have had a significant contact with these HCWs were placed in quarantine for 2 weeks, which ended in negative PCR results in all members examined. At the same time, our institution also restricted hospital visits of family members to be one person per patient, and closed common facilities, such as the nursery room, common rehabilitation hall, and the cafeteria. Self-assessment twice a day for fever and/or symptoms possibly indicative of COVID-19 has become mandatory for all HCWs to identify those who were unwell, thereby trying to prevent a nosocomial outbreak. There has been neither absenteeism of HCWs because of the refusal of work assignment for the COVID-19 unit nor any nosocomial outbreak at the time of writing this report.

Given the possible risk of opportunistic infections, positive pressure single rooms had been installed for the pediatric cancer patients even before the COVID-19 pandemic. Children and their guardians were asked to strictly adhere to the institutional infection controls including avoidance of any overcrowded situation. All HCWs were well instructed about institutional IPC measures, and the implementation of basic infection control procedures has been evaluated to be effective during the last 5 years in controlling nosocomial outbreaks, such as seasonal respiratory infections of influenza and respiratory syncytial viruses.

Study design

We performed both qualitative and quantitative analyses from 20 th April to 5 th May 2020. For the qualitative study, we conducted a semi-structured interview based on a phenomenological approach to explore the commonalities of occupational distress and dilemma of HCWs in a pediatric cancer ward. In brief, prior to the initiation of the interview, the principal investigator (KK) performed a cross-organizational interview with each section chief, *i.e.* , pediatric hematology and oncology, nursing, and rehabilitation. Each verbatim transcription was reviewed independently by the coauthors. On analyzing the data, we designed an interview guide. Then, two authors, *i.e.* certified public psychologist (MI) and psychiatrist (MS) conducted a semi-structured interview with HCWs focusing on the relevant occupational pressure and mental health well-being. Participants were recruited through purposive and snowball sampling, and the sample size was determined by data saturation, *i.e.* , at the point when no new themes from participants’ experiences emerged.

Anonymous interview resources were discussed to conceptualize within the research group following the Colaizzi’s method [7]. In the end, 11 HCWs, including 3 nurses, 3 physicians, 2 nursery nurses, and 3 therapists, contributed to this research interview. Prior to the initiation of one-to-one interviews, the objectives, confidentiality, and voluntary nature of the study were explained in detail to all participants, and written informed consent was obtained. The two interviewers established good relationships with the participants

and remained neutral in collecting the data without bias. We used techniques, such as unconditional acceptance and active listening, to promote the authenticity of the data. The interview records were kept strictly confidential. It was conducted in a separate room under quiet circumstances with an average of 30 minutes per person based on the following predesigned interview guide: (1) What is your primary work in pediatric cancer wards?; (2) Have you ever been exposed to patients who were having or had symptoms suggestive of COVID-19?; (3) What is your current view on COVID-19?; (4) What worries do you have in your workplace during this pandemic?; (5) How have your current daily duties affected your quality of life?; (6) What is your *stress* -coping method in the midst of the outbreak?; (7) Please let us know if there is any modification required for the question items in the questionnaire survey.

To ensure trustworthiness and credibility of the qualitative study, we further validated our findings with a questionnaire survey by referring to the previous studies. The psychological impact was quantified using a 4-point Likert-type scale (strongly agree, 3; agree, 2; slightly agree, 1; disagree, 0; no comment, blank). For each questionnaire survey, we used linear regression analyses to determine the effect of individual variables, *i.e.* , working expertise and years of experience, for each questionnaire item. The institutional ethics committee approved this study.

Results

Fourteen HCWs contributed to the semi-structured interview to conceptualize the core of occupational distress. Of 77 recruited for the questionnaire survey, a total of 54 HCWs (70%), 27 nurses, 20 physicians, 2 nursery nurses, and 5 therapists, anonymously completed the response. The demographic characteristics of qualitative and quantitative analyses include clinical expertise, duration of working experience, and gender (Table 1). The five categories of the psychological experiences in response to the pandemic were as follows:

Category 1: Safety and reassurance

As both institutional infection control and quarantine strategy are pertinent, there has been no nosocomial outbreak of COVID-19 in AGMC from January to October 2020. HCWs had a high level of confidence in the institutional IPC guidelines, and this situation further motivated them to adhere to standard precautions. As a result, they perceived a sense of safety and reassurance for the protection against the risk of occupational COVID-19 exposure. We cited a related questionnaire item for the following surveillance as follows: Q1) I have a high sense of reliability on standard precaution measures including hand hygiene and general mask wearing.

Category 2: Fear and stigma of being an asymptomatic carrier

Despite the high confidence in and obedience to the IPC measures, HCWs had overwhelming concerns for possible spreading the virus to susceptible persons, *i.e.* , pediatric cancer patients, pregnant women, and elderly patients with various underlying disorders. There were also serious concerns for the stigma and interpersonal avoidance of being an asymptomatic carrier to put one's working circumstance at risk. The related questionnaire items were: Q2) Although I might unavoidably develop COVID-19, I must absolutely try not to transmit the virus to hospitalized children; Q3) I have an overwhelming anxiety of passing the virus to my family or loved ones. In the former questionnaire of Q2, we found that HCWs generally perceived an overwhelming pressure and related stigma of passing the virus to vulnerable children, and there were no variations in the levels of anxiety among the individual bases. Q3 highlights the more intense anxiety of the childcare staff of being a portal of viral transmission in comparison with physicians, $P < 0.05$.

Category 3: Perception of working dilemma and incompetence about COVID-19

As the pandemic progressed, staff meetings were encouraged to be conducted by using video conferencing. Having a meal, during which mask removing was inevitable, was required to do separately from each other. Following the prioritization of the virus containment strategy, they perceived loneliness and also felt as if they had to keep an eye on each other. As a result, HCWs began to feel challenged to maintain interpersonal communication in the working environment and perceive powerlessness. Furthermore, given that accompaniment of family members is important for young inpatients, the restriction of hospital visits of guardians

and paucity of caregivers' assistance induced an additional workload for HCWs, which eventually resulted in the profound frustration of not being fully allowed to provide their best care. The representative quotations were as follows: Q4) With an increasing number of adult patients admitted monthly, I feel a growing psychological pressure; Q5) I feel exhausted from working due to COVID-19; Q6) I would like to discuss current problems about COVID-19 more frankly and efficiently; Q7) Communication among colleagues appears to be deteriorating because of the strict adherence to control principles of avoiding the "Three Cs". As was consistent with the previous reports in SARS and COVID-19 [1, 8], we also found that HCWs with working experience less than 5 years and/or childcare frontline staff were prone to perceive psychological pressure, occupational burden, and limited interpersonal communication $P < 0.05$.

Category 4: Concern for environmental factors

Our institution has been dedicated to COVID-19 patients along with successful virus containment for more than 6 months, but there were also several growing concerns for the institutional strategy in future epidemics. The representative quotations were as follows: Q8) In the light of the possible risk of nosocomial outbreak and vulnerability of pediatric cancer patients, I think that patients in pediatric cancer wards should be, at least temporarily, transferred to another hospital. In the early period of the pandemic, most of the nursing staff perceived that the hospital, like ours, assigned to care for COVID-19 patients, is not safe enough to ensure the safety of management of hospitalized cancer children in comparison with physicians, $P < 0.05$. In contrast, physicians did not report an increased working dilemma, were generally optimistic about maintaining ethical obligation to their profession, and pushed themselves to further continue with their task. We also asked about the safety climate for the preparedness of restarting patient supportive activities, such as: Q9) I think that it may be acceptable to restart a nursery room activity for the children hospitalized; Q10) I think that it may be acceptable to restart an educational activity for hospitalized children. We found that physicians perceived that it is acceptable enough to restart educational activities for the hospitalized school-aged inpatients, but nursing staff felt it is too early to resume it. We also asked the future perspective of organizational intervention for the mental health safety-net: Q11) It would be important to leverage a mental health safety-net in our hospital. The response levels were variable with a higher level of request in physicians in comparison with nursing staff ($P < 0.05$).

Category 5: Self-adjustment and resilience for a future pandemic

In the midst of the outbreak, we also found the positive emotions to cope with the crisis. The representative quotations were as follows: Q12) I would like to quit working on the pediatric ward; Q13) It is our social responsibility to accept patients with COVID-19; Q14) I expect that after this current crisis will successfully be controlled, our team dynamics may be further strengthened. Given that HCWs were mostly resilient and kept strong social responsibility, we found that HCWs with working experience less than 5 years were not as motivated to overcome the crisis, $P < 0.05$.

Discussion

Since the beginning of the 21st century, there has been a number of highly pathogenic human corona virus pandemics, *i.e.*, SARS in 2003, MERS in 2012, and COVID-19 in 2020 [9]. In comparison with the two former viruses, COVID-19 has several distinct features, such as a relatively prolonged incubation period, a heterogeneous clinical picture, and resultant difficulties in containment strategy; it eventually induced unprecedented disruptions in healthcare systems. During the early period of the current pandemic, much attention has been paid particularly to the psychological distress of working personnel on the frontline, such as the emergency room and intensive care unit [1, 2], but the situation turned out to be overwhelming irrespective of the extent of exposure to infected patients [10]; HCWs working with uninfected patients are also negatively affected by the current pandemic. We therefore launched this prospective analysis focusing on the occupational distress of HCWs working on the pediatric cancer ward and confirmed the comparable psychological distress, which was mostly identical to frontline HCWs, such as the emergency room and intensive care unit of the hospitals dedicated to COVID-19 patients [1, 2, 8].

We also confirmed that both nursing staff (including nursery nurses and rehabilitation therapists) and HCWs

with less than 5 years of working experiences perceived more intense distress. In contrast, physicians were relatively less affected. The difference between nursing staff and physicians might be explained due to a higher workload and longer time in direct contact with susceptible young patients by the former group. As expected, we also found that close-proximity interaction of the nursing staff during childcare becomes an obstacle for avoiding the “Three Cs”, which further enhanced their additional occupational distress of fear of contagion. Furthermore, HCWs generally perceived a limited interpersonal communication among the working staff while prioritizing social distancing. It is important to address that all of the participants of the semi-structured interview felt satisfied with the talking session. Their representative quotations were as follows: “Since I had little opportunity to talk over the pandemic in the workplace, I appreciate the chance to talk in this research interview”, “I realized that I had tried not to think of working stress until this interview”, and “I hesitated to talk over my private concern because I did not want to make my colleagues worry”. Our results are in line with the study of Shechter *et al.*, suggesting that talk therapy is included as a second stress-coping behavior among New York COVID-19 frontline healthcare workers during the COVID-19 pandemic [2]. Since we found that limited interpersonal communication is detrimental for the safety climate in the workplace, we believe that it would be important to launch workshops and/or group interviews to cultivate internal coping and self-care style as one of the organizational interventions [11], particularly for the young workers who seem to be more susceptible to occupational distress with relatively lower resilience in response to the pandemic.

One of the strengths of our research is the qualitative and quantitative combinatory analyses, which have allowed us to analyze the psychological experiences of HCWs caring actively for pediatric cancer patients in the midst of the outbreak. These in-depth analyses have permitted us to conceptualize the interweaved perceptions of both psychological distress and resilience, which will eventually drive the hospital staff to prepare to overcome the current crisis. Despite being concerned with negative psychological impacts against the pandemic, we also found that the HCWs were relatively resilient with a strong confidence in the institutional IPC measures. It might be possible that both their perception of greater sense of control and personal achievement provides positive feedback loops for the institutional safety climate to enhance HCWs’ adherence to the institutional IPC measures [12]. Despite the understanding of the psychological experiences of HCWs, we must acknowledge that the study might have incurred some limitations. First, the study subjects were limited to HCWs. It would be interesting to include other kinds of workers within the study, *i.e.*, receptionists, guards, clerks, janitors, cleaners, and others. We are convinced that such cross-organizational study is important when implementing institutional IPC guidelines in future epidemics. Second, we need to expand our scope of surveillance toward chronic psychogenic morbidity of HCWs, such as insomnia and post-traumatic stress disorder, as was discussed in the previous pandemics [8, 13]; this issue should be explored in the future.

In future epidemics, coping with community-based viral transmission, especially via mobile children and youths, is indispensable to contemplate sustainable public health management [3]. The psychogenic experiences in the pediatric cancer ward have a wider relevance to childcare strategy, not only in the hospital, but also in public health systems, including clinics, schools, nurseries, and day care centers. In this regard, we would like to suggest that recognizing the psychological distress of HCWs working for childcare would be valuable not only to provide the target approach to mitigate their concern, but also development of future childcare strategy in the era of COVID-19.

Conflict of Interest statement: The authors have no conflicts of interest to disclose.

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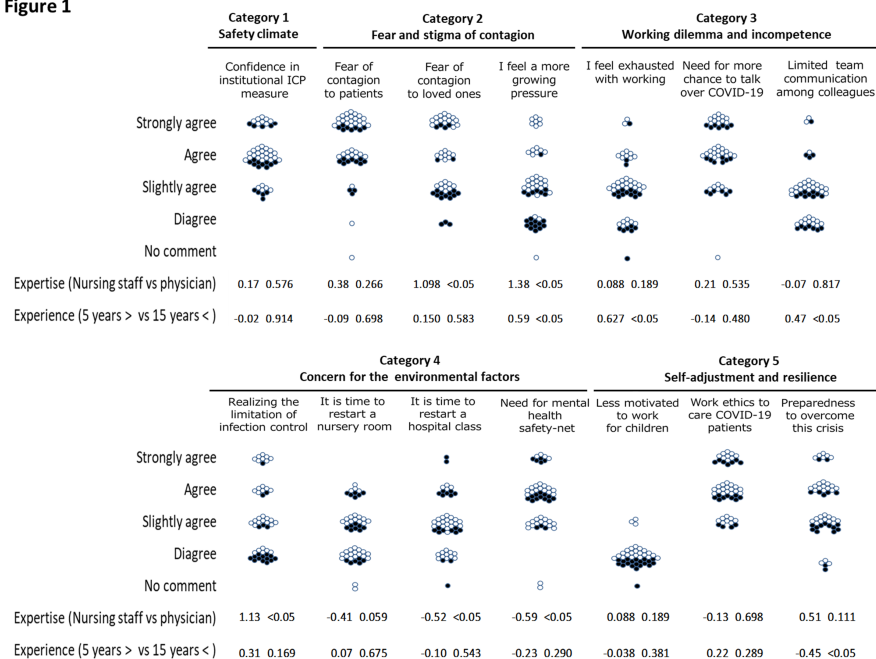
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Table 1. Demographic characteristics of the participants

Figure 1.

Psychological profiles of health care workers working in the pediatric cancer ward. Beeswarm plot shows the results of the questionnaire survey. White circles represent the responses from nursing staff, which includes nurses, nursery nurses, and rehabilitation therapists (n=34), and filled circles from the physicians (n=20). Coefficients and *P* values in regression analysis to determine the effect of clinical variables are shown at the bottom. Upper row: the association of expertise for the development of psychological responses, nursing staff *vs* physicians (reference). Lower row: the association of working experience, less than 5 years *vs* more than 15 years (reference), as well.

Figure 1



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