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# Stress and Resilience of Japanese Teachers in Special Needs Schools for Students With Intellectual Disabilities During the COVID-19 Pandemic

*Shuhei Ogawa[1]*, Risato Kawamura[1] and Michio Kojima[2]*

*[1] Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Japan, [2] Faculty of Human Sciences, University of Tsukuba, Tsukuba, Japan*

In Japan, numerous special needs school teachers take sick leave because of mental illness. This study aims to develop a stressor scale for special needs school teachers working during COVID-19 pandemic and to clarify the actual conditions and relationships among stressors, stress responses, and resilience of such teachers in schools for people with intellectual disability. The questionnaire was completed by 227 special needs teachers. Six factors emerged from factor analysis: difficulty in dealing with guardians, disconnection between schools and national and local educational policies, relationship troubles among coworkers, busyness, lack of specialty, and trouble in dealing with COVID-19. The scale's criterion-related validity and internal consistency were verified. The results revealed virtually no relationship between trouble in dealing with COVID-19 and stress responses. However, the higher the degree of relationship troubles among coworkers and busyness, the higher their stress responses. Multiple regression analysis revealed that the resilience subfactors were negatively related to stress responses.

**Keywords: special needs school teacher, stressor, stress response, resilience, COVID-19**

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****Correspondence:***
*Shuhei Ogawa*
*shuhei.ogawa77@gmail.com*

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## INTRODUCTION

The Japanese (Ministry of Education, Culture, Sports, Science and Technology, 2013) asserted that because teachers in Japanese school education have personal contact with their students, their physical and mental health must be good. However, a large percentage of Japanese public school teachers take sick leave because of mental illness. In 2020, 5,478 (0.59%[1]) Japanese public school teachers[2] took sick leave because of mental illness (Ministry of Education, Culture, Sports, Science and Technology, 2020a), the highest number ever recorded. Twenty years ago, mental illness

[1]Officially, this figure is the percentage of employees who took sick leave and the percentage of employees who took sick leave of 1 month or more.

[2]Refers to principals, vice-principals, teachers, assistant teachers, nurse teachers, assistant nurse teachers, nutrition teachers, lecturers, practical training assistants, and dormitory instructors (primary staff) at elementary, junior high, high, and secondary schools as well as schools for the blind, deaf, and the disabled (special needs schools).

compelled only 2,262 teachers to take sick leave (Ministry of Education, Culture, Sports, Science and Technology, 2007). This number has since increased 2.4 times.

By contrast, the Japanese (Ministry of Health, Labour and Welfare, 2018) revealed that only 0.4%[3] of Japanese workers in all industries took sick leave because of mental illness. Therefore, compared with Japanese workers employed in industries, a greater percentage of Japanese public school teachers tend to take sick leave because of mental illness. Furthermore, in Japan, special needs teachers[4] tend to take more sick leaves because of mental illness than elementary, junior high, and high school teachers. Statistics have revealed that 0.72% of special needs teachers have taken sick leaves (Ministry of Education, Culture, Sports, Science and Technology, 2020a). In terms of the percentage of teachers taking sick leave due to mental illness, special needs school teachers were approximately 1.1 times as likely as elementary school teachers to take sick leave, approximately 1.2 times as likely as junior high school teachers, and approximately 1.7 times as likely as high school teachers (Ministry of Education, Culture, Sports, Science and Technology, 2020a). Thus, it can be deduced that the mental health of Japanese special needs school teachers is critical and that it requires urgent countermeasures.

## Stressors and Stress Responses

In Japan, it has been assumed that COVID-19 has burdened and exacerbated the mental health of special needs school teachers in their endeavors to put measures in place – such as disinfecting classrooms and corridors – in order to prevent the spread of COVID-19 and to devise lessons so as to ensure that students adhere to social distancing. Notably, special needs school teachers experience many types of stressors, including the quality of work, office work, educational lessons, and relations with protectors and coworkers (Ministry of Education, Culture, Sports, Science and Technology, 2013). Kitade and Kato (2012) revealed that relations with coworkers, busyness, lack of specialty, relations with protectors, and lack of local support are strong stressors that special needs teachers experience. It has been estimated that many types of stressors have resulted in stress responses in special needs school teachers, thus exacerbating their mental health. These figures were obtained prior to the COVID-19 pandemic, and it can be assumed that the workload of special needs school teachers increased during the pandemic, resulting in more stressors. Although a stressor scale of special needs school teachers has been developed (Kitade and Kato, 2012; Sakamoto et al., 2015), it does not consider COVID-19-related factors. Accordingly, such a scale must be developed.

In this study, a stressor scale was developed assuming six factors, including the above factors related to the COVID-19 pandemic: difficulty in dealing with guardians, disconnection between schools and national and local educational policies, relationship troubles among coworkers, busyness, lack of specialty, and trouble in dealing with COVID-19. Parents have been identified as a stressor for teachers, leading to the selection of dealing with guardians as a stressor (Yoneyama et al., 2005). Likewise, cases of discrepancies between teachers and national and local policies have arisen (e.g., Saito, 2020). Team-teaching in special needs school teachers and the difficulties between coworkers that arise from this have been identified as a possible source of stress (Mori and Tanaka, 2012b). Further, special needs school teachers have been found to be extremely busy. For example, Mizuho Research & Technologies, Ltd. (2018) found that despite the limit to their assigned working hours of 7 h and 45 min, Japanese special needs school teachers generally work more than 11 h a day as well as an extra 2.1 days per month on holidays. Although 20 days of paid leave are allowed, less than 10% of special needs school teachers utilize all these days. Act No. 77 of 1971 provides public school teachers with 4% of their monthly salary as a teaching adjustment, but it does not provide any overtime or holiday pay (Takahashi, 2019). Takahashi (2019) noted that the salary adjustment stipulated by this law means that teachers can legally work unquantified hours. Although the 1966 MEXT survey on Japanese teachers' working conditions found that they worked 8 h overtime per month; a similar survey conducted in 2006 found that they worked around 34 h overtime (Hirota, 2020). Finally, it has been noted that teachers' mental health is negatively affected because of evaluation concerns from colleagues due to the lack of specialized training (Mori and Tanaka, 2012a). Furthermore, the lower the lack of specialty the more likely burnout is to occur (Mori and Tanaka, 2011).

## Resilience

Resilience is closely related to stress. Masten et al. (1990) defined resilience as "the process of, capacity for, or outcome of successful adaptation, despite challenging or threatening circumstances." As a concept, resilience represents individual psychological adaptation to stress and focuses primarily on adaptation and recovery after stress (Hirano and Umebara, 2018). The higher the resilience, the lower the depression and apathy as a stress response (Saito and Okayasu, 2011). Psychological traits that help individuals recover from difficult situations need to be examined in relation to the psychology of recovery from difficult situations (Oshio et al., 2002). In this study, we also consider resilience from the perspective of psychological traits. This approach may assist special needs school teachers in Japan to reduce the amount of sick leaves that they have to take because of mental illness. The American Psychological Association (2014) classified resilience factors into four categories: the capacity to make realistic plans and take steps to carry them out, a positive view of oneself and confidence in one's strengths and abilities, communication and problem-solving skills, and capacity to manage strong feelings and impulses. Essentially, these factors encompass key factors involved in resilience (Oshio, 2016). Oshio (2016) further explained how each factor of conventional resilience scales developed in Japan is related to the four resilience factors classified by the APA (2014). Although a few scales meet all the broad components of resilience, the Bidimensional Resilience Scale (Hirano, 2010) covers a relatively wide range

[3]The percentage of employees who were absent from work for one or more consecutive months because of mental health problems in the previous year. The figures are rounded to the first decimal place.

[4]In Japan, some special needs schools provide educational activities for children with disabilities to help them become independent and participate in society (National Institute of Special Needs Education, 2020).

of resilience. Therefore, this scale was deemed beneficial to be employed in this study for comprehensively clarifying the psychological characteristics related to special needs school teachers' mental health.

The Bidimensional Resilience Scale (Hirano, 2010) is unique in that it views resilience as an aspect of personality and is based on Cloninger et al.'s (1993) personality theory, which classified personality into temperament and character. Temperament is believed to have strong innate factors, whereas character is considered to have strong acquired factors. In accordance with this theory, Hirano's (2010) scale comprises innate and acquired factors that are strongly related to temperament and character, respectively. Innate factors are not necessarily acquired but are more likely to be defined by one's original temperament (Ueno et al., 2018). Innate factors are further classified into four categories: optimism, self-regulation, sociability, and action. Acquired factors are further divided into three categories: problem-solving orientation, self-understanding, and understanding the psychology of others. It is important, as alluded to previously, to clarify which individual characteristics have a positive influence on stress response so as to enable teachers to have a flexible stress response when performing their duties.

## Objectives

Accordingly, this study has twofold objectives. The first objective is developing a stressor scale for special needs school teachers in Japan and to verify its validity and reliability. The second objective is to shed light on special needs school teachers' resilience and its relationship with stressors and stress responses during the COVID-19 pandemic. Specifically, the factors of resilience that effectively reduce the stress responses of special needs school teachers were clarified to provide them with support in the future. This approach would provide clues on how to help special needs school teachers manage mental health difficulties. In our study, the target group will be teachers at special needs schools for individual with intellectual disabilities, which have the largest number of schools and teachers among all types of special needs schools[5] in Japan.

# MATERIALS AND METHODS

## Scale Development

In developing the stressor scale for special needs school teachers, the existing stressor scales for teachers (Kitade and Kato, 2012; Sakamoto et al., 2015) and those for nursery school teachers of daycare facilities for children with disabilities (Shiratori and Kanno, 2012) were employed as references. We developed 33 items considered appropriate stressors for special needs school teachers. The content validity was reviewed by four special needs school teachers in a preliminary investigation. Among the four teachers, three had worked at a special needs school for 20 years or more, while the fourth had worked at such a school for more than 10 years. Furthermore, two of the teachers with more than 20 years' experience had experience as an undergraduate manager. We evaluated whether any expressions in the questionnaire were difficult to understand. Additionally, we ensured that the contents of the questionnaire were related to the stress that special needs school teachers may have experienced, thereby confirming the content validity of the stressor scale.

## Attributes and Procedures

From a list of prefectural special needs schools in Japan, we selected special needs schools for intellectual disabilities with elementary, middle, and high school courses. The special needs schools with even numbers on the list were asked to participate in the survey. Accordingly, 611 teachers from six special needs schools with intellectual disabilities were administered the questionnaire survey. We sent the questionnaires to the person in charge at the special needs schools that allowed us to conduct the survey, asking them to distribute them to the teachers. Of the teachers who received the questionnaire, those who agreed with the purpose of the questionnaire responded, and the school manager returned the questionnaire to the authors. SPSS (Ver. 25) was employed to analyze the data.

## Investigation Period

The survey was distributed and collected between October and December 2020.

## Participant Identification

The respondents provided information regarding their gender, age, job title, faculty affiliation, homeroom teacher status, number of years of teaching experience, number of years of experience at a special needs school, and possession of a license for special needs schools. The responses of administrators, school nurse teachers, nutrition teachers, assistant teachers, and technical staff were excluded.

## Measurement Tools

### Stressors

The 33 items developed during the aforementioned procedure were employed in the stressor scale for special needs school teachers. The respondents were required to assess the frequency of each item from April of that year to the present on a five-point scale ranging from 1 (never) to 5 (always). Higher scores indicated the presence of stressors.

### Stress Responses

The Public Health Research Check List Short Form (Imazu et al., 2006) was employed to measure the stress responses. The scale comprised four factors and 24 items. Psychological as well as physical stress responses can be measured with a small number of items, thereby enabling to measure stress responses simply and polyphonically. Items were evaluated on a three-point scale, ranging from 0 (never) to 2 (often). High scores indicate more stress responses. Imazu et al. (2006) demonstrated the validity and reliability of the scale.

[5]In Japan, there are special needs schools for those with intellectual, visual, hearing, physical, and health disabilities. Of the approximately 1,100 special needs schools, 800 such schools were for those with intellectual disabilities (Ministry of Education, Culture, Sports, Science and Technology, 2020b).

### Resilience

The Bidimensional Resilience Scale (Hirano, 2010) was employed to measure resilience. The factor structure is layered. As aforementioned, the scale comprises innate and acquired factors. Although the former encompasses four factors (i.e., optimism, self-regulation, sociability, and action), the latter comprises three factors (i.e., problem-solving orientation, self-understanding, and understanding the psychology of others). Items were assessed on a five-point scale ranging from 1 (no) to 5 (yes). High scores indicate higher resilience. Hirano (2010) clarified the validity of the scale. Furthermore, while the reliability of superordinate factors – innate resilience factors and acquired resilience factors – range from 0.72 to 0.83, the reliability of the seven subordinate factors range from 0.48 to 0.85. However, we decided to utilize this scale because it has been one of the most commonly used scales in resilience research recently in Japan. Moreover, this scale has a large number of subfactors and broadly encompasses the concept of resilience.

### Ethics

Consent was obtained from the principals and teachers of the special needs schools. At the time of implementation, a written explanation that participation was voluntary, that respondents would experience no disadvantage even if they did not respond, and that their privacy would be protected was provided. Furthermore, an approval was obtained from the research ethics committee of the research institution to which the first author belongs.

# RESULTS

## Factor Structure of the Scale

Among the 611 questionnaires distributed to the teachers of six special needs schools, 267 were completed (response rate 43.7%). Excluding the administrators, school nurse teachers, nutrition teachers, assistant teachers, and technical staff, data of 227 teachers were utilized in the analysis. Before examining the factor structure of the stressor scale, descriptive statistics were investigated. As ceiling effects were found in two items and floor effects in one item, three items were excluded from the analysis. Factor analysis (unweighted least-squares method, promax rotation) was conducted. Subsequently, the factor analysis was repeated, excluding items with factor loadings of 0.40 or less. The results revealed six factors across 23 items (**Table 1**). The percentage of total variance explained by the six factors was 66.8%. The first factor called *difficulty in dealing with guardians* included five items, which mentioned receiving complaints from guardians and dealing with complex and troubled families. The second factor, *disconnection between schools and national and local educational policies*, included four items related to disconnection between actual conditions at schools and national and local educational policies, including the lack of understanding of school sites by national and local governments. The third factor, *relationship troubles among coworkers*, comprised five items related to the inability to fit into the workplace atmosphere and more interference than necessary from other staff. The fourth factor, which included four items associated with difficulty taking a break as well as difficulty taking time to research teaching materials, was termed *busyness*. The fifth factor, *lack of specialty*, comprised two items related to the lack of one's own guidance skills and specialty. The sixth factor, which comprised three items related to difficulties in conducting classes after taking measures to prevent the spread of COVID-19 and difficulties foreseeing the annual educational plan during the COVID-19 pandemic, was termed *trouble in dealing with COVID-19*.

## Validity of the Developed Scale

To examine the validity of the stressor scale for special needs school teachers, correlation coefficients of total stressors and stress responses were calculated (**Table 2**). The results revealed that the correlation of total stressor and stress response is moderately significant ($r = 0.48$, $p < 0.01$). A significant positive correlation was observed between the total stress response score and the following subfactors of the stressor scale: *difficulty in dealing with guardians* ($r = 0.20$, $p < 0.01$), *disconnection between schools and national and local educational policies* ($r = 0.30$, $p < 0.01$), *relationship troubles among coworkers* ($r = 0.47$, $p < 0.01$), *busyness* ($r = 0.39$, $p < 0.01$), *lack of specialty* ($r = 0.33$, $p < 0.01$), and *trouble in dealing with COVID-19* ($r = 0.17$, $p < 0.05$).

## Internal Consistency of the Scale

### Stressors

The alpha coefficients for internal consistency were 0.85, 0.87, 0.78, 0.77, 0.87, and 0.72 for the six factors, respectively.

### Stress Responses

Imazu et al. (2006) included adult males and females aged 18–64 years. However, in this study, only special needs school teachers were included. Cronbach's alpha coefficient was calculated, revealing that the internal consistency was 0.93.

### Resilience

Hirano (2010) demonstrated that the subfactors had low internal consistency. As Hirano's study only included college students, internal consistency was evaluated in our study. The results showed that the alpha coefficients for internal consistency were 0.83 for optimism, 0.65 for self-regulation, 0.86 for sociability, 0.69 for action, 0.72 for problem-solving orientation, 0.64 for self-understanding, and 0.75 for understanding the psychology of others.

## Correlation Coefficient of Each Scale

**Table 2** shows the correlation coefficients for each scale. There was little correlation between stressors and resilience. Furthermore, significant positive correlations that ranged between 0.17 and 0.47 were found between the stressor subfactors and stress response.

## Stressors, Stress Responses, and Factors Influencing Resilience

To compare the mean scores for each factor in each attribute, a one-way analysis of variance was conducted with gender, age, and

**TABLE 1 |** Factor analysis of the stressor scale for the special needs school teachers (unweighted least-squares method with promax rotation).

| | Factor loading | % of Variance |
|---|---|---|
| Factor 1: Difficulty in dealing with guardians (α = 0.85) | | 27.40 |
| 19. Being swept up in the family problems of the children | 0.76 | |
| 22. Receiving complaints from guardians | 0.76 | |
| 15. Dealing with complex and troubled families | 0.74 | |
| 1. Trouble dealing with guardians | 0.73 | |
| 10. Lack of cooperation from protectors | 0.61 | |
| Factor 2: Disconnection between schools and national and local educational policies (α = 0.87) | | 10.47 |
| 24. Disconnection between actual conditions at schools and national and local educational policies | 0.85 | |
| 14. Lack of understanding of school sites by national and local governments | 0.80 | |
| 30. Disagreements between the national or local government's education policy and your own ideas | 0.74 | |
| 6. Inadequate support for school sites by national and local governments | 0.61 | |
| Factor 3: Relationship troubles among coworkers (α = 0.78) | | 9.22 |
| 7. Inability to fit into the workplace atmosphere | 0.74 | |
| 16. More interference than necessary from other staff | 0.63 | |
| 5. Communication difficulties between coworkers | 0.62 | |
| 31. Poor relations between coworkers | 0.62 | |
| 12. Disagreement between management's ideas and your own | 0.50 | |
| Factor 4: Busyness (α = 0.77) | | 8.60 |
| 26. Difficulty taking a break | 0.75 | |
| 33. Difficulty taking time to research teaching materials | 0.71 | |
| 2. Heavy workload | 0.61 | |
| 17. Difficulty taking annual leave | 0.51 | |
| Factor 5: Lack of specialty (α = 0.87) | | 6.01 |
| 18. Lack of own guidance skills | 0.94 | |
| 11. Lack of own specialty | 0.81 | |
| Factor 6: Trouble in dealing with COVID-19 (α = 0.72) | | 5.10 |
| 29. Difficulties conducting classes after taking measures to prevent the spread of the disease | 0.66 | |
| 23. Difficulties foreseeing the annual educational plan during the COVID-19 pandemic | 0.66 | |
| 9. Restrictions in school lessons because of COVID-19 | 0.60 | |

**TABLE 2 |** Correlation coefficient between each scale.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| **Stressor** | | | | | | | | |
| 1. Total score(α=0.88) | | | | | | | | |
| 2. Difficulty in dealing with guardians(α=0.85) | 0.70** | | | | | | | |
| 3. Disconnection between schools and national and local educational policies(α=0.77) | 0.73** | 0.34** | | | | | | |
| 4. Relationship troubles among coworkers (α=0.78) | 0.65** | 0.34** | 0.35** | | | | | |
| 5. Busyness(α=0.77) | 0.76** | 0.39** | 0.44** | 0.42** | | | | |
| 6. Lack of specialty(α=0.87) | 0.27** | 0.08 | 0.00 | 0.08 | 0.19** | | | |
| 7. Trouble in dealing with COVID-19(α=0.87) | 0.54** | 0.27** | 0.46** | 0.08 | 0.30** | 0.13 | | |
| **Stress response** | | | | | | | | |
| 8. Total score(α=0.93) | 0.48** | 0.20** | 0.30** | 0.47** | 0.39** | 0.33** | 0.17* | |
| **Resilience** | | | | | | | | |
| 9. Total score(α=0.92) | −0.13* | 0.09 | −0.08 | −0.21** | −0.16* | −0.23** | −0.01 | −0.45** |

*$p < 0.05$, **$p < 0.01$.

faculty affiliation as the independent variables and the stressors and their subfactors – that is, stress response, and resilience – as the dependent variables (**Table 3**). Gender analysis found primary effects for the stressors [$F(1,225) = 5.59$, $p < 0.05$], disconnection between the schools and national and local educational policies [$F(1,225) = 4.32$, $p < 0.05$], busyness [$F(1,225) = 8.39$, $p < 0.01$], lack of specialty [$F(1,225) = 4.18$, $p < 0.01$], trouble in dealing with COVID-19 [$F(1,225) = 5.79$, $p < 0.05$], stress response [$F(1,225) = 47.99$, $p < 0.01$], and resilience [$F(1,225) = 15.35$, $p < 0.01$]. Age analysis found primary effects for the stressors

**TABLE 3 |** Comparison of mean scores for each scale and factor by performing one-way analysis of variance (gender, age, and faculty affiliation).

| | Gender | | Age[a] | | | | Faculty affiliation[b] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male *n* = 95 | Female *n* = 132 | 20s *n* = 52 | 30s *n* = 73 | 40s *n* = 49 | 50s *n* = 44 | Elementary *n* = 90 | Junior high *n* = 47 | High *n* = 78 |
| Stressor total score (SD) | 2.88 (0.51) | 3.03 (0.49) | 2.88 (0.55) | 2.88 (0.43) | 3.12 (0.52) | 3.09 (0.50) | 2.94 (0.49) | 2.93 (0.42) | 3.00 (0.55) |
| F-value | 5.59* | | 3.82* | | | | 0.57 | | |
| MC | | | 30s < 40s | | | | | | |
| Difficulty in dealing with guardians (SD) | 2.71 (0.77) | 2.62 (0.76) | 2.47 (0.81) | 2.62 (0.70) | 2.73 (0.81) | 2.86 (0.73) | 2.44 (0.70) | 2.72 (0.74) | 2.84 (0.75) |
| *F*-value | 0.89 | | 2.39 | | | | 6.89** | | |
| MC | | | | | | | Elementary < High | | |
| Disconnection between schools and national and local educational policies (SD) | 3.06 (0.87) | 3.30 (0.86) | 2.98 (0.87) | 2.99 (0.80) | 3.55 (0.85) | 3.45 (0.87) | 3.19 (0.87) | 3.18 (0.75) | 3.14 (0.92) |
| *F*-value | 4.32* | | 6.82** | | | | 0.06 | | |
| MC | | | 20s, 30s < 40s, 50s | | | | | | |
| Relationship troubles among coworkers (SD) | 2.21 (0.63) | 2.35 (0.68) | 2.23 (0.71) | 2.27 (0.59) | 2.45 (0.76) | 2.29 (0.62) | 2.26 (0.58) | 2.31 (0.73) | 2.27 (0.70) |
| *F*-value | 2.51 | | 1.14 | | | | 0.10 | | |
| Busyness (SD) | 2.83 (0.88) | 3.18 (0.88) | 2.87 (0.84) | 2.83 (0.92) | 3.28 (0.83) | 3.32 (0.90) | 3.09 (0.87) | 2.65 (0.82) | 3.15 (0.90) |
| *F*-value | 8.39** | | 4.78** | | | | 5.46** | | |
| MC | | | 30s < 40s, 50s | | | | Junior high < Elementary, High | | |
| Lack of specialty (SD) | 3.22 (0.84) | 3.44 (0.80) | 3.82 (0.79) | 3.32 (0.75) | 3.29 (0.80) | 2.94 (0.73) | 3.49 (0.82) | 3.29 (0.87) | 3.26 (0.78) |
| *F*-value | 4.18* | | 10.73** | | | | 1.94 | | |
| MC | | | 20s < 30s, 40s, 50s | | | | | | |
| Trouble in dealing with COVID-19 (SD) | 3.84 (0.71) | 4.06 (0.69) | 3.88 (0.80) | 3.97 (0.57) | 4.01 (0.71) | 4.11 (0.74) | 3.98 (0.70) | 4.07 (0.73) | 3.93 (0.66) |
| *F*-value | 5.79* | | 0.95 | | | | 0.65 | | |
| Stress response (SD) | 0.46 (0.36) | 0.82 (0.40) | 0.65 (0.47) | 0.63 (0.39) | 0.74 (0.41) | 0.68 (0.42) | 0.69 (0.42) | 0.66 (0.39) | 0.66 (0.42) |
| *F*-value | 47.99** | | 0.74 | | | | 0.55 | | |
| Resilience (SD) | 3.73 (0.54) | 3.44 (0.58) | 3.59 (0.58) | 3.58 (0.54) | 3.46 (0.53) | 3.60 (0.67) | 3.45 (0.54) | 3.64 (0.59) | 3.63 (0.63) |
| *F*-value | 15.35** | | 0.66 | | | | 2.54 | | |

*$p < 0.05$, **$p < 0.01$. MC = Multiple comparison. [a]In the age category, only nine respondents were in their 60s, and thus, they were excluded from the analysis. [b]Faculty members who did not belong to any department were excluded from the analysis.*

[$F(3,214) = 3.82$, $p < 0.05$], disconnection between the schools and national and local educational policies [$F(3,214) = 6.82$, $p < 0.01$], busyness [$F(3,214) = 4.78$, $p < 0.01$], and lack of specialty [$F(3,214) = 10.73$, $p < 0.01$]. Multiple comparisons (Tukey method, 5% level of significance) revealed that the stressors were significantly higher for individuals in their 40s than those in their 30s; the disconnection between schools and national and local educational policies was significantly higher in those in their 40s and 50s than those in their 20s and 30s; busyness was significantly higher in those in their 40s and 50s than in those in their 30s; and lack of specialty was significantly higher in those in their 30s, 40s, and 50s than in those in their 20s. The faculty affiliation analysis revealed primary effects for difficulty in dealing with guardians [$F(2,212) = 6.89$, $p < 0.01$] and busyness [$F(2,212) = 5.46$, $p < 0.01$]. Multiple comparisons (Tukey method, at a 5% level of significance) revealed that difficulty in dealing with guardians was significantly higher in high school section for students with intellectual disabilities than in elementary school section for students with intellectual disabilities, and busyness was significantly higher in elementary and high school sections for students with intellectual disabilities than in junior high school section for students with intellectual disabilities.

## Correlations Between Resilience Subfactors and Stress Responses and Multiple Regression Analysis

To examine the relationships between the resilience and stress response subfactors, a multiple regression analysis was conducted, with stress response as the dependent variable and resilience subfactors as the independent variables (**Table 4**). The results were significant in the decision count ($R^2 = 0.35$, $p < 0.01$). When the standard regression coefficients were examined, a positive path was observed in the stress response from ability to action ($\beta = 0.19$, $p < 0.01$) and negative paths were found for optimism ($\beta = -0.31$, $p < 0.01$), self-regulation ($\beta = -0.33$, $p < 0.01$), sociability ($\beta = -0.15$, $p < 0.05$), and self-understanding ($\beta = -0.21$, $p < 0.01$).

**TABLE 4 |** Correlation between resilience subfactors and stress responses and results of multiple regression analysis.

| | Stress response | |
|---|---|---|
| | *r* | β |
| Optimism | −0.49** | −0.31** |
| Self-regulation | −0.42** | −0.33** |
| Sociability | −0.40** | −0.15* |
| Action | −0.13 | 0.19** |
| Problem-solving orientation | −0.33** | 0.07 |
| Self-understanding | −0.37** | −0.21** |
| Understanding the psychology of others | −0.21** | 0.14 |
| $\triangle R^2$ | | 0.35** |

*$p < 0.05$, **$p < 0.01$.

# DISCUSSION

## Validation of the Scale's Reliability and Validity

A scale comprising six factors emerged from the factor analysis as follows: difficulty in dealing with guardians; disconnection between schools and national and local educational policies; relationship troubles among coworkers; busyness; lack of specialty; and trouble in dealing with COVID-19. The factor loadings for all items were higher than 0.50, showing that the scale was highly explanatory for these factors. The correlation coefficients between the total stressor and total stress response scores were calculated to determine the criterion-related validity, from which a moderately significant positive correlation was found. Mori and Tanaka (2012a) also found a significant positive correlation between stressors and poor mental health, which included the stress response of special needs school teachers. These findings suggested that the stressor scale for special needs school teachers developed in this study had criterion-related validity. The internal consistency of the scale was examined to verify its reliability, with the results demonstrating that the alpha coefficients for each subfactor ranged from 0.72 to 0.87, indicating reasonable reliability.

## Relationship Between Stressors, Stress Responses, and Resilience

The second objective of this study was to determine the reality and relationships between the stressors, stress responses, and the resilience of special needs school teachers in Japanese schools that catered to children with intellectual disabilities during the COVID-19 pandemic. Significant positive correlations were found between all subfactors for the stressors and stress responses. Yoneyama et al. (2005) noted that stressors related to the difficulty in dealing with guardians increased the teachers' stress responses in other types of schools, such as elementary schools. This finding is consistent with the findings in our study. The stress responses may have occurred because the disconnection between schools and national and local educational policies differed from the educational policies and support that special needs school teachers considered appropriate for their particular situations. It has been suggested that opinions regarding the support needed by special needs school teachers are not sufficiently reflected in the national and local government educational policies. One example was the government's decision to introduce a modified working hours system for teachers in 2019 by amending Act No. 77 of 1971 despite opposition from many teachers. A survey conducted by Japan Educational Press (2019) found that 91% of the respondents were against the modified working hours system. More than 50,000 people, including public school teachers, university professors, and members of the Association of Bereaved Families Concerned about Death from Overwork, signed an online petition for the system to be abolished, which was submitted to MEXT (Saito, 2020). However, although the national government encountered several legal problems (Takahashi, 2019), the modified working hours system was introduced. Kaneko (2020) claimed that the introduction of this system would possibly result in longer working hours. Thus, it is hoped that school policies and suitable support for special needs schools will be clarified in detail in the future and fully reflected in the national and local government educational policies.

The stipulations of Act No. 77 of 1971 are partly responsible for the busyness of Japanese teachers. Therefore, it is imperative that Act No. 77 of 1971 be repealed or revised to ensure a limit on the working hours of Japanese special needs school teachers.

Mori and Tanaka (2012a) found that the Japanese teachers involved in special support education who questioned their own specialty tended to have poorer mental health because of concerns about their colleagues' possible evaluations. As special needs teachers have been found to work over 11 h on weekdays as well as overtime (Mizuho Research & Technologies, Ltd., 2018), an increase in the number of weekday training sessions to enhance their expertise would be more likely to add to their overtime load and further exacerbate their poor mental and physical health. Therefore, to improve the special needs teachers' specialty skills, national and local governments must implement appropriate education policies to allow them the time to enhance their professionalism. In other words, a system is needed that allows special needs teachers to attend training during their working hours.

Relationship troubles among coworkers has been found to be related to burnout, that is, severe physical and mental exhaustion (Kitade and Kato, 2012), which may also be directly associated with the amount of sick leave taken due to mental illness. Team teaching, which in Japan is employed in many special needs classes, has been associated with special needs teachers' stress responses in schools catering to students with intellectual difficulties. Mori and Tanaka (2012b) found that team teaching contributed to the stresses that special needs teachers were experiencing primarily because teachers with different educational philosophies are forced to work together.

A small significant correlation between stressors and stress responses was found for trouble in dealing with COVID-19, suggesting that special needs teachers may not have experienced considerable stress responses when dealing with COVID-19. The items on the questionnaire related to trouble in dealing

with COVID-19 were related to teaching, such as the difficulties faced when conducting classes while also having to implement hygiene measures to stop the spread of COVID-19, and the restricting of school lessons. Essentially, the findings revealed that the special needs teachers did not experience many stress responses during the COVID-19 pandemic, which may have been because of the curricula at special needs schools. Although students in every elementary, junior high, and high school grades must attain certain standards, which makes implementing drastic changes to the curricula difficult, during the COVID-19 pandemic, except for the general classes in special needs schools, the curricula were flexibly altered to suit the needs of the students. Therefore, COVID-19 may have had less of an adverse stress response effect on special needs teachers than teachers in other schools.

Multiple regression analysis results revealed that optimism, sociability, self-regulation, and self-understanding had significant negative correlations with stress responses. Optimism, which had the highest relative value, is defined as a tendency to be positive rather than negative (Scheier and Carver, 1985). Ishige and Muto (2005) have found that the higher a person's optimism, the lower their stress response, which reconfirms the importance of optimism in maintaining mental health. Sociability is defined as a preference for being involved with others and having an ability to easily communicate (Hirano, 2010). Therefore, special needs teachers who are highly sociable would be more likely to communicate with their colleagues and build positive relationships. Consequently, if they experienced an increased stress response, these relationships would have a positive dampening effect on their stress responses. Self-regulation refers to the ability to deal with unknown events, such as physical condition and emotions (Hirano, 2010). Therefore, the work of special needs teachers is by its very nature emotional, and they need to be able to control their emotional expressions, which could increase their mental burdens (Yabe and Tojo, 2011). If special needs teachers can effectively self-regulate and manage their emotions, they will be better able to perform their duties and deal with stress responses. Self-understanding is the ability to understand one's thoughts and characteristics (Hirano, 2010). Therefore, studies are needed to assess the self-understanding of special needs teachers to shed light on whether this factor is related to their sick leave related to mental illness.

### Limitations

This study has several limitations. First, the Bidimensional Resilience Scale's (Hirano, 2010) reliability was somewhat low ($\alpha$ = 0.64–0.86); therefore, the reliability of this scale needs further investigation. Second, this study targeted teachers at special needs schools for the intellectually disabled. Although these schools make up the majority of special needs schools in Japan (Mori et al., 2013), teachers who work at special needs schools for the physically disabled have been found to have higher burnout rates than those who work at other types of special needs schools, such as for the blind, deaf, and intellectually disabled (Sakamoto et al., 2015). Therefore, teachers in different types of special needs schools may have different stressors and stress responses, meaning that the relationships between stressors, stress responses, and resilience for special needs teachers at these different schools need to be explored.

## CONCLUSION

This study develops a stressor scale for special needs school teachers working during the COVID-19 pandemic to clarify the relationships among stressors, stress responses, and resilience in such teachers in schools for people with intellectual disability. A six-factor stressor scale was developed for use in Japanese special needs schools and found to be valid and reliable. The stressors most relevant to the stress responses of Japanese special needs school teachers were relationship troubles among coworkers and busyness. In contrast, there was no relationship between trouble in dealing with COVID-19 and stress responses of special education teachers. This absence of a correlation between these two factors could be because the curricula of Japanese special education schools are relatively more flexible compared to regular schools. In addition, the higher the resilience sub-factors – optimism, self-regulation, sociability, and self-understanding – the lower the stress responses. Further accumulation of knowledge with respect to the mental health of special needs school teachers based on this study would be desirable in the future.

## DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the response data will be kept in a locked locker, and after a certain period of time after the completion of the research, it will be shredded and destroyed. Requests to access the datasets should be directed to SO, shuhei.ogawa77@gmail.com.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Research Ethics Committee of University of Tsukuba. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.