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RESEARCH ARTICLE

Mental Health of Mothers of Preschoolers Amid the COVID-19 Pandemic in Japan: A Cross-sectional Study

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Abstract:

Background:

The COVID-19 pandemic and the government's emergency declarations in Japan may have influenced people's mental health. In particular, among women, there are concerns about the occurrence of neuroses, such as depression and anxiety.

Objective:

This study aimed to identify the factors related to mental distress among women in Japan who were raising children amid the COVID-19 pandemic.

Methods:

An online survey was conducted in 2020 among 730 Japanese women raising preschoolers. The survey included questions about child-rearing, anxiety, and the 12-item General Health Questionnaire (GHQ-12). The average age of the respondents was 34.4 years (21–52 years), and 31.5% of the respondents were living in "Prefectures under Specific Cautions" areas.

Results:

The prevalence of clinically significant levels of mental distress according to GHQ-12 scores was 41.5%. The highest predictor of mental distress was "Maternal anxiety about child-rearing" (Odds Ratio = 3.27, 95% Confidence Interval: 2.41–4.45). Other factors that affected their mental condition included concerns about children's health and avoiding visiting hospitals for treatment.

Conclusion:

Mothers raising preschoolers experienced increased mental distress because of pandemic-related closures and heightened maternal anxiety about child-rearing. Thus, women who are raising preschoolers and confined to their homes need to be provided mental healthcare.

Keywords: COVID-19, GHQ-12, Child-rearing, Anxiety, Mental health, Preschoolers.

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1. INTRODUCTION

On January 30, 2020, the Director-General of the World Health Organization (WHO) declared the COVID-19 outbreak a public health emergency of international concern. This infectious disease is still a major global public health threat [1, 2]. The COVID-19 pandemic has brought unprecedented changes to people's lives both directly and indirectly through lifestyle changes, physical distancing, and socioeconomic restructuring. These changes affect people's moods and mental health in the long term. Many reports indicate that people have developed mental health problems due to the pandemic [3, 4]. This is particularly applicable to women. For example, reports show that in China, the prevalence of post-traumatic stress symptoms is high among women living in areas strongly impacted by COVID-19 [5]. There is also a significant relationship between being female and experiencing increased stress, anxiety, and overall psychological effects [6, 7]. According to a sophisticated systematic review, being female is associated with lower psychological well-being and higher anxiety and depression scores as indirect effects of the pandemic [8].

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Many studies highlight the gender differences in the risk of depression [9]. Women are 2.48 times more likely than men to be diagnosed with depression or anxiety, and there is a clear causal relationship between their mental condition and stressful life events [10].

On April 7, 2020, the Japanese government declared a national state of emergency; subsequently, 13 areas were designated as "Prefectures under Specific Cautions," where citizens were restricted from going out and migrating to other prefectures. These daily life restrictions were reported to aggravate depression and anxiety among mothers with preschoolers [11].

In recent years, risk factors associated with the COVID-19 pandemic and suicide attempts have been the focus of worldwide attention. Several studies have shown that financial crises due to loss of employment were risk factors associated with suicide and suicide attempts during the COVID-19 pandemic [12, 13]. In addition, suicide rates were found to increase depending on social distance and degree of isolation [14, 15].

WHO recognizes suicide prevention as a public health priority and has been closely monitoring changes in suicide rates following the pandemic.

Japan has one of the highest suicide death rates internationally, with about 20,000 people committing suicide each year [16]. Compared to the previous year, suicide rates among women were reported to increase by 30% in 2020 due to the COVID-19 pandemic [17]. It is speculated that this is because of women's economic hardships and mental health problems, but the causes of these problems have not been fully investigated [18]. Many women in their 20s and 30s with infants were among those who committed suicide [19].

Even before the pandemic, Japan had been marked by mothers' maternal anxiety about child-rearing, a concept similar to childcare stress among mothers caring for preschoolers [20]. Japanese mothers' "anxiety about child-rearing" has been reported to be a complex concept and has the potential to predict not only the mental health of mothers but also the mother-child relationship and child development [21].

Thus, it would be beneficial to develop public health measures to clarify how the mental health of women raising preschoolers is affected by the pandemic and the risk factors.

This study aims to clarify the neurosis experienced by women raising preschoolers in Japan amid the COVID-19 pandemic and identify the factors behind it.

2. METHODS

This study was a cross-sectional survey. In December 2020, we screened 6000 women, aged 20–55 years, registered on a web-based internet survey company (Freeasy; iBRIDGE Company, Tokyo, Japan) to determine if they had any children. The iBRIDGE Company is an exclusive research panel agency established in 2006, with approximately 274,317 voluntarily registered participants. This study was conducted during the spread of the COVID-19 pandemic. We anticipated that the presence of a family member who was infected with COVID-19 would potentially affect the results. Therefore, individuals who currently (at the time of the study) or previously had an infected family member were excluded. We shortlisted 2,391 women who answered "yes" to the question, "Do you have preschool children (0–6 years)?" and had no infected family members. Of these, 730 (30.5%) completed the web questionnaire. The registration information also included the age, marital status, children (if any, the number of children and their age), household income, working status, and prefecture of residence. The participants were residents from all 47 prefectures in Japan.

The sample size for this study was calculated using a population of 12 million Japanese women aged 20–39 years. The minimum sample size required for our study was 387 according to an apriori power analysis using the Raosoft sample size calculator, based on a 95% confidence level (CI), 5% margin of error, and an anticipated response rate of 50%. The required sample size was found to be 665 when the confidence level increased to 99% using the same formula. We confirmed that the sample size of our study was sufficient.

All procedures conducted were approved by the Medical Faculty Ethics Committee of Niigata University (IR. 2020-0297). Informed consent was electronically obtained before data were collected from the participants.

2.1. Instruments

The questionnaire used in this study focused on the severity of the situation, anxiety, and psychological distress that mothers were experiencing in terms of childcare due to the pandemic.

Part 1 collected details of the participants' demographics, including age, gender, education, employment status, and annual income. In addition to the closure of hospitals, there are reports that the pandemic has caused stress to children and parents due to avoidance of medical visits due to the fear of being infected by accessing medical care [22]. For this reason, the questionnaire items compared mothers' perceptions during the pandemic to those before the pandemic. Details included fever, anorexia, fear of infection risk, and anxiety about child-rearing. We asked participants questions such as "Are you hesitant to take your child to the hospital?" "Do you worry about your child's temperature?" "Do you worry about your child's appetite?" "Do you worry about your child's sense of taste due to the pandemic?" "Do you worry about your child washing his or her hands?" "Do you have anxiety about your child-rearing ability?" and so on. These questions were answered with a "yes/no" response.

Part 2 consisted of the 12-item General Health Questionnaire (GHQ-12), which measures symptoms of psychosomatic disorders in healthy people. The GHQ-12 is an excellent instrument developed in the UK to measure non-psychotic psychological distress with psychometric properties [23, 24]. It consists of 12 items with a 4-point Likert scale (0 = Better than usual, 1 = As usual, 2 = Worse than usual, 3 = Much worse than usual), which is converted to a bimodal score (01); responses 0 and 1 were scored 0 and responses 2 and 3 were scored 1. The total score was 0–12, with a cut-off of 3/4 points. A score of 4 points or more was considered a state of

mental illness [25]. In the present study, Cronbach's alpha of GHQ-12 = .854, which indicated high internal consistency.

2.2. Data Analysis

SPSS ver. 27 was used to encode and analyze the data. The software allows for the elimination and filtering of outliers and missing data. Categorical and continuous data were classified using frequency, percentage, average distribution, and standard deviation to provide an overview of the target demographics. Since the Japanese government's designation of 13 prefectures as "Prefectures under Specific Cautions" in 2020 due to the spread of COVID-19 [26], participants' residences were classified into two sections as "Specific alert prefectures/Non-Alert Prefectures." In addition, work, household income, family form, and highest education were categorized.

Next, an unpaired t-test or a chi-squared test was conducted to identify the independent variables that significantly influenced mothers' mental health, and significant factors were extracted. For dependent variables, those with a GHQ-12 score of 4 or above were included in the reference group for health conditions. Then, a binomial logistic regression analysis was performed. Mothers' age was treated as a continuous variable, while all other variables were categorical. The results were reported as odds ratios (ORs) and 95% CIs. All reported p-values were two-tailed, and a statistical association was set as significant at p-value < 0.05.

3. RESULTS

3.1. Socio-demographic Background of the Study Participants

Participants were 730 women with an average age of 34.4 years (Standard Deviation (SD): 5.5; range: 21–52), with those in their 30s comprising the largest age bracket. A total of 31.5% lived within the "Prefectures under Specific Cautions" and 68.5% outside. People who did not have a job (65.3%) outnumbered those who did (34.7%). As for household income, 44.4% were annually earning 5 million yen or less, while 56.6% were earning more. Regarding the highest level of education, they had received, 43.2% listed university or graduate school, and 56.8% no more than junior college. In Japan, three-generation households with grandparents live in the same house. In this survey, such households accounted for 7.0% of the total. Meanwhile, almost half (43.8%) of the respondents reported maternal anxiety about child-rearing. Participants' socio-demographic characteristics are shown in Table **1**.

Table 1. Demographic characteristics of the participants (n=730).

-	n	%
Age of participants (years)	-	-
20–29	142	19.5
30–39	450	61.6
40–49	138	18.9
Age of participants' children (youngest)	-	-
≤1 year	302	41.4
2–4 years	300	41.1
5–6 years	128	17.5
Infection alert for residential areas	-	-
Prefectures under Specific Cautions	230	31.5
Non-Prefectures under Specific Cautions	500	68.5
Employment status	-	-
Employed	253	34.7
Unemployed	477	65.3
Annual household income	-	-
< 5,000,000 yen	324	44.4
5,000,000–10,000,000 yen	365	50.0
≥ 10,000,000 yen	41	5.6
Education Level	-	-
University or graduate degree	316	43.2
Short-term college graduation	207	28.4
High school graduate	207	28.4
Family Type	-	-
A nuclear family	679	93.0
A three-generation household	51	7.0
Maternal anxiety about child-rearing	-	-
Yes	320	43.8
No	410	56.2

3.2. Mental Health Issues

The mean score of GHQ-12 was 3.59 (SD = 3.29), and of the 730 participants, 41.5% had a score of 4 or higher, considered a mentally unhealthy condition. The results are encoded in such a way that the higher the score, the worse the mental health condition. Table **2** shows the results using bimodal scoring.

Item 4 had the highest response frequency at 52.4%, followed by Item 5 at 52.0%, indicating that most participants were dismayed with decision-making and stress. This was followed by Item 9, which showed that 38.5% of the participants were unhappy and depressed. Items 10 and 12 indicated that 30.8% and 34.4% of the respondents did not feel happy and lost confidence, respectively.

3.3. Mothers' Mental Health Conditions and Associated Factors

Table **3** shows the subjective changes in the participants' daily life amid the COVID-19 pandemic, along with mean GHQ-12 scores. Those who answered "yes" to the question regarding maternal anxiety about child-rearing had the highest GHQ-12 score at 4.75 (SD = 3.49), indicating that they were experiencing an unhealthy mental condition. Those who answered "yes" to "Do you worry about your child's appetite" had a GHQ-12 score of 4.17 (SD = 3.17), while those who answered "yes" to "Do you worry about your child's sense of taste due to the pandemic?" had a GHQ-12 score of 4.0 (SD = 3.38). Thus, their GHQ-12 scores reached 4 or higher in each case. Those who answered "yes" to other questions, even if their scores did not reach 4, still tended to have a relatively high score.

Table 2. GHQ-12 scores by item (n=730).

S.No	GHQ-12 Item	Mean	SD	Skewness	Kurtosis	Response Frequencies (%)	
		-	-	-	-	0	1
1	Able to concentrate*	0.15	0.36	1.942	1.776	84.8	15.2
2	Lost much sleep	0.23	0.42	1.313	-0.277	77.4	22.6
3	Playing a useful part*	0.19	0.39	1.569	0.463	80.8	19.1
4	Capable of making decisions*	0.52	0.50	-0.099	-1.996	47.6	52.4
5	Under stress	0.52	0.50	-0.082	-1.999	47.9	52.0
6	Could not overcome difficulties	0.26	0.44	1.087	-0.821	73.9	26.2
7	Enjoy your day-to-day activities*	0.25	0.43	1.144	-0.692	74.8	25.2
8	Face up to problems	0.16	0.36	1.898	1.608	84.4	15.7
9	Feeling unhappy and depressed	0.38	0.49	0.474	-1.780	61.5	38.5
10	Losing confidence	0.31	0.46	0.832	-1.311	69.2	30.8
11	Thinking of self as worthless	0.27	0.44	1.055	-0.890	73.3	26.7
12	Feeling reasonably happy*	0.34	0.48	0.659	-1.570	65.6	34.4
-	Total	3.59	3.29	0.856	-0.195	-	-

Note: The two least symptomatic answers were scored as 0, and the two most symptomatic answers were scored as 1 (*i.e.*, 0-0-1-1).
*These items are reverse-coded (*i.e*, 1-1-0-0). GHQ-12: General Health Questionnaire-12; SD: Standard Deviation

Table 3. Demographic Characteristics by GHQ-12 Items.

S.No	Behavioral Changes Compared to before the Pandemic	-	-	GHQ-12				-
		n	%	Mean	SD	t/F	p	-
1	Are you hesitant to take your child to the hospital?	-	-	-	-	-	-	-
-	Yes	441	60.4	3.93	3.38	3.55	<.001	**
-	No	289	39.6	3.07	3.09	-	-	-
2	Do you worry about your child's temperature?	-	-	-	-	-	-	-
-	Yes	530	72.6	3.76	3.32	2.25	.025	*
-	No	200	27.4	3.15	3.17	-	-	-
3	Do you worry about your child's appetite?	-	-	-	-	-	-	-
-	Yes	297	40.7	4.17	3.17	3.92	<.001	**
-	No	433	59.3	3.19	3.10	-	-	-
4	Do you worry about your child's sense of taste due to the pandemic?	-	-	-	-	-	-	-
-	Yes	284	38.9	4.00	3.38	2.71	.007	**
-	No	446	61.1	3.33	3.21	-	-	-
5	Do you worry about your child washing their hands?		-	-	-	-	-	-
-	Yes	551	75.5	3.79	3.39	3.11	.002	**
-	No	179	24.5	2.98	2.90	-	-	-

(Table 3) contd.....

S.No	Behavioral Changes Compared to before the Pandemic	-	-	GHQ-12				-
		n	%	Mean	SD	t/F	p	-
6	Would going to the hospital increase the risk of infection?	-	-	-	-	-	-	-
-	Yes	452	61.9	3.88	3.43	3.15	.002	**
-	No	278	38.1	3.12	2.99	-	-	-
7	Do you have a chronically ill child?	-	-	-	-	-	-	-
-	Yes	85	11.6	3.80	3.11	0.64	.522	-
-	No	643	88.1	3.56	3.32	-	-	-
8	Do you have anxiety about your child-rearing ability?	-	-	-	-	-	-	-
-	Yes	320	43.8	4.75	3.49	9.61	<.001	**
-	No	410	56.2	2.69	2.82	-	-	-
-	Circumstances	-	-	-	-	-	-	-
9	Infection alert for residential areas	-	-	-	-	-	-	-
-	Specific alert prefectures	230	31.5	3.84	3.36	1.394	.166	-
-	Non-Alert Prefectures	500	68.5	3.47	3.25	-	-	-
10	Employment status	-	-	-	-	-	-	-
-	Employed	253	34.7	3.63	3.40	0.26	.066	-
-	Unemployed	477	65.3	3.57	3.23	-	-	-
11	Annual household income T	-	-	-	-	-	-	-
-	< 5,000,000 yen	324	44.4	3.85	3.26	1.89	.152	-
-	5,000,000–10,000,000 yen	365	50.0	3.39	3.32	-	-	-
-	≥ 10,000,000 yen	41	5.6	3.27	3.19	-	-	-
12	Education level T	-	-	-	-	-	-	-
-	University or graduate degree	316	43.3	3.16	3.21	4.84	.008	**
-	Short-term college graduation	207	28.4	3.87	3.30	-	-	-
-	High school graduate	207	28.4	3.97	3.33	-	-	-
13	Age of participants +	-	-	-	-	-	-	-
-	≤ 33 years old	330	45.2	3.63	3.32	0.31	.075	-
-	≥ 34 years old	400	54.8	3.56	3.27	-	-	-
14	Family type	-	-	-	-	-	-	-
-	A nuclear family	679	93.0	3.57	3.30	-0.57	.568	-
-	A three-generation household	51	7.0	3.84	3.23	-	-	-

Note: Unpaired t-test

T: one-way ANOVA

+: The median value was calculated and classified into two groups.

* p < .05, **p < .01; GHQ-12: General Health Questionnaire-12; SD: Standard Deviation

3.4. Factors Behind Mothers' Mental Health Issues

Binomial logistic regression analysis was performed with objective variables having GHQ-12 scores of 4 or higher, which indicate the ill mental health of Japanese mothers amid the pandemic (Table **4**). Explanatory variables are items for which a significant difference was obtained. These were: "Do you have anxiety about your child-rearing ability?": Yes (OR = 3.27, 95% Cl: 2.41–4.45); "Do you worry about your child washing his or her hands?": Yes (OR = 1.68, 95% Cl: 1.18–2.41); "Are you hesitant to take your child to the hospital?": Yes (OR = 1.63, 95% Cl: 1.2–2.21); "Do you worry about your child's appetite": Yes (OR = 1.60, 95% Cl: 1.11–2.33); "Do you worry about your child's temperature?": Yes (OR = 1.51, 95% Cl: 1.08–2.12), in that order. Regarding education, when university/graduate school was assigned the value of 1, the figures for junior high school/high school and technical college/junior college were both significant (OR = 1.43, 95% Cl: 1.00–2.05), indicating that mental health conditions tend to be worse for people with lower levels of education.

Table 4. Odds ratios and 95% confidence intervals for several factors predicting an increase (≥ 4) in GHQ-12 using binomial logistic regression analysis.

Variables	Control	OR	95% CI		p-value
	-	-	Lower Limit	Upper Limit	
Do you have anxiety about your child-rearing ability?	YES	3.27	2.41	4.45	<.001
Do you worry about your child washing their hands?	YES	1.68	1.18	2.41	<.001
Are you hesitant to take your child to the hospital?	YES	1.63	1.20	2.21	<.001
Do you worry about your child's appetite?	YES	1.60	1.11	2.33	.01

(Table 4) contd.....

Variables	Control	OR	95% CI		p-value
	-	-	Lower Limit	Upper Limit	
Do you worry about your child's temperature?	YES	1.51	1.08	2.12	.02
Would going to the hospital increase the risk of infection?	YES	1.45	1.07	1.97	.02
Do you worry about your child's sense of taste due to the pandemic?	YES	1.24	.85	1.81	.26
Education level	University or graduate degree	1	-	-	-
-	Short-term college graduation	1.43	1.00	2.05	.05
-	High school graduate	1.43	1.00	2.05	.05
Infection alert for residential areas	Specific alert prefectures	1.19	.87	1.63	.29

Abbreviations: OR: Odds Ratio; CI: Confidence Interval.

4. DISCUSSION

This study, conducted in 2020, approximately one year after the outbreak of the COVID-19 pandemic, examined the factors affecting the mental health of women raising preschoolers in Japan. Vaccines for COVID-19 were unavailable in Japan at the time of data collection.

Among the participants of this study, 41.5% were mentally unhealthy, according to the GHQ-12 scores. This figure is similar to that of women in Spain during the lockdown [27]. While it has been reported that 65.6% of healthcare workers in Japan, who are under heavy stress during the pandemic, have a GHQ-12 score of 4 or higher [28], the figures of this study's participants did not reach the level of healthcare workers. Even so, they may be experiencing severe mental distress.

Results revealed that the mental health problems of the participants were not related to whether they lived in an area where activities were restricted due to the state of emergency. However, they were strongly related to maternal anxiety about child-rearing amid the COVID-19 pandemic. Other than maternal anxiety about child-rearing, factors negatively impacting the participants' mental health were their children's temperature, worrying about whether their children washed their hands, hesitation to see a doctor, and caring for children at home.

Studies on the prevalence of COVID-19 mental health in Asia found that age and gender are important predictors of adverse psychological effects [29, 30]. In a study of Southeast Asian countries, a significant prevalence of adverse mental health was found among young women, with higher rates among the more educated [31]. These results support the evidence that women were severely affected by the COVID-19 pandemic due to their increased workload, both at work and home, a higher risk of domestic violence, and a lack of resilience in dealing with the crisis. However, the aspect of the child-rearing burden has received less attention.

In Japan, fear of infection has led to a reluctance to see pediatricians. As a result, the number of outpatients decreased by up to 80% compared to pre-pandemic levels and by 40% on average. However, it is reported that patients tended to visit doctors only after they became critically ill [32]. This suggests that children are cared for at home until they become critically ill [33].

While there are reports that the stressors related to lockdowns and telecommuting amid the pandemic were strongly associated with mental disorders [34], the situation in Japan was such that mental health problems also emerged among mothers living in areas that were not under lockdown. No differences were observed between those who had a job and those who did not, indicating that changes in workstyles were unrelated to changes in mental conditions.

Japanese mothers had been experiencing high levels of anxiety and burden regarding child-rearing even before the pandemic. Moreover, it has been reported that their anxiety intensifies when they accompany sick children to the hospital [35].

In Japan, a high suicide rate among the youth has been a major public health concern. Among six major industrialized countries, suicide is a leading cause of death among the youth only in Japan. In particular, suicide is the leading cause of death among women aged 15–29 [36]. Their psychological difficulties might have been compounded by the pandemic. In 2020, it was reported that suicides among women increased by 20% to 30% because of the COVID-19 pandemic. Difficulties in visiting a doctor due to hospital closures or avoiding visiting a doctor because of the fear of infection would be very stressful for mothers and cause distress. The present study also suggests poor education leads to high GHQ-12 scores. During the SARS pandemic in 2003, it was indicated that people's ability to gather and understand information played an important role in halting the spread of the disease [37]. During a pandemic, the government must provide information on clinics and hospitals that provide emergency treatment. At the same time, it is necessary to strengthen health literacy, including media use among people, and dispense correct knowledge of infectious diseases and preventive measures.

While previous discussions have suggested that medium- to long-term economic uncertainty associated with COVID-19 would increase people's mental burden and raise the risk of depression, no clear relationship was observed between income and mental health among the participants of this study. More than half of the participants had annual incomes exceeding 4,730,000 yen (about 32,000 USD), the average household income in Japan. This suggests that they were not impacted significantly by economic hardship.

In light of the above, it is recommended that the government or mental health institutions provide counseling for mothers and children confined to their homes and help them recover from the effects of COVID-19. It is also desirable that they create a program for providing individual consultations or plan individual visits. Thus, the results of this study may be useful in predicting who is likely to suffer from mental health problems during a pandemic in Japan.

4.1. Limitations and Future Directions

There are some limitations in interpreting the results of this study. This study did not conduct a long-term follow-up, even though the effects of COVID-19 may change over time. Thus, long-term effects need to be further examined. In addition, because the survey was conducted online, data on people who do not use internet devices were not included. Furthermore, this study did not collect information on potential risk factors, such as life events (death, divorce, unemployment, *etc*). For this reason, any bias related to these factors was not considered. This study provides a cross-sectional analysis of the mental health of mothers raising preschoolers in Japan. However, as the timeframe was short, another study is needed in the future to examine, for example, the impact of vaccination on mental health.

CONCLUSION

This study was conducted to investigate the impact of the COVID-19 pandemic on mothers raising preschoolers in Japan. In this study, the GHQ-12 scores indicated a prevalence of clinically significant levels of psychological distress among 41.5% of the participants, with "Maternal anxiety about child-rearing" as the most effective predictor of psychological distress. Moreover, although 31.5% of the respondents resided in "Prefectures under Specific Cautions," the regional characteristics were not significant predictors. Mothers with preschoolers often experience mental distress due to a sense of entrapment caused by the pandemic and anxiety about childcare; thus, there is a need for psychological care for women with children confined to their homes.

LIST OF ABBREVIATIONS

GHQ-12	=	General Health Questionnaire
ORs	=	Odds Ratios
SD	=	Standard Deviation

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All procedures conducted were approved by the Medical Faculty Ethics Committee of Niigata University (IR. 2020-0297).

HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All the humans were used per the ethical standards of the committee responsible for human experimentation (institutional and national) and with the Helsinki Declaration of 1975, revised in 2013. (http://ethics.iit.edu/ecodes/node/3931).

CONSENT FOR PUBLICATION

Informed consent was obtained electronically before data were collected from the participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated or analyzed during this study are not publicly available due to the type of ethical clearance approved. Data cannot be shared publicly. Instead, data will only be shared as a published article.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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