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# Creation of a COVID-19 Stigma Scale and its Psychometric Characteristics: Investigating Pregnant Japanese Women

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**Abstract**

The stigma surrounding COVID-19 can have detrimental effects on individuals affected by the virus as well as those providing care and support. This study aimed to create and validate a scale for measuring COVID-19-related stigma on an 11-point scale. A cohort of 696 pregnant women, ranging from 12 to 15 weeks gestation, participated in an online survey, which included the newly developed COVID-19 stigma scale along with other relevant variables. The internal consistency of the scale was assessed using the omega index, while measurement invariance was also examined.

Exploratory factor analysis (EFA) was conducted on half of the sample (n = 350) to analyze the scale items, followed by confirmatory factor analysis (CFA) on the remaining half (n = 346). Various structural models, including single, two, three, and four-factor models derived from EFA, were compared in the CFA. The most suitable model comprised three factors: omnidirectional avoidance, attribution avoidance, and hostility, demonstrating good internal consistency (all omega indexes >0.70).

Furthermore, the three-factor structural model exhibited consistency in composition, measurement, and structure across different groups, including primiparas vs. multiparas and younger women (under 32 years) vs. older women (32 years and older). Notably, factors such as birth fear, maternal-fetal attachment, compulsive symptoms, depression, adult attachment styles, and borderline personality traits showed significant correlations with specific subscales of the COVID-19 stigma scale, underscoring its validity.

The findings highlight the robustness of the COVID-19 stigma scale in terms of its factor structure and compositional validity, shedding light on the psychological impact of infectious disease stigma. The study underscores the importance of addressing stigma associated with COVID-19, as it can hinder effective intervention efforts and exacerbate psychological distress among affected individuals and caregivers. Furthermore, it emphasizes the need to evolve societal attitudes towards infectious disease stigma in modern times, recognizing its potential to impede pandemic control efforts.

**Keywords:** Covid-19; Psychological distress; Infectious disease; Pregnant Japanese women

## Introduction

Exploring the impact of stigma is crucial for effectively managing COVID-19 and mitigating associated mental health challenges. A pivotal initial step involves developing a user-friendly, psychometrically validated stigma scale tailored for COVID-19. A PubMed search using the terms ((Stigma) AND (COVID-19)) AND (Scale OR Inventory OR Measurement) yielded 339 articles, from which we identified 14 articles addressing COVID-19 stigma. However, none of these articles delved into the psychometric aspects (such as content validity, factor structure, measurement invariance, etc.) of the topic [1,2].

The COVID-19 pandemic in Japan has heightened fears of infection among the populace. In a tightly knit society like Japan, individuals are increasingly attuned to community behavior. Those deviating from societal norms may face scrutiny or even condemnation, being labeled as "disruptive" or "outliers." Non-authoritative figures may impose strict regulations on fellow citizens perceived to be non-compliant with social expectations, exacerbating societal stigma [3].

Pregnant women are particularly vulnerable to mental health challenges amid the COVID-19 pandemic. Research indicates that they frequently experience mood disturbances, anxiety, and trauma-related symptoms. The presence of infectious diseases and associated stigma can significantly impact their psychological well-being and adaptation.

## Method

### Learning course and participants

In this online survey, 696 pregnant women in their 12th to 15th week of gestation participated. The participants were recruited through Luna and Baby, a web application by MTI Ltd., Tokyo, Japan, over a two-week period from December 7th to 21st, 2020. Representing nearly every prefecture in Japan, participants were assured of anonymity and voluntary participation. The questionnaire included comprehensive information regarding the survey's purpose, affiliations, consent details, and contact information for the survey counseling center [4]. As an incentive, participants were offered e-commerce credits usable for Amazon purchases. Approximately 10 weeks later, a follow-up study was conducted, inviting the same 696 pregnant women to assess the factor structure, measurement, and structural invariance of the scale. Of these, 245 pregnant women (35.2%) responded [5,6].

It is speculated that the three dimensions of COVID-19 stigma have distinct etiologies and repercussions. Pregnant women exhibiting attribution avoidance and hostility were found to be more prone to

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experiencing symptoms of obsessive-compulsive disorder (OCD), major depressive episodes (MDE), and borderline personality traits. Such psychopathological tendencies may exacerbate prejudicial attitudes and vice versa, suggesting potential bidirectional causality. Exploring longitudinal trends could shed light on this causal relationship. Additionally, these women's marital relationships were characterized by a negative self-image, which could intensify their fear and resentment towards infected individuals. High levels of hostility were associated with an increased likelihood of displaying borderline personality traits, suggesting a potential underlying link between personality traits and stigma/prejudice [7,8]. Pregnant women expressing heightened attribution avoidance and hostility were more likely to experience fear of childbirth, while those exhibiting elevated hostility levels were prone to negative self-perceptions.

### The impact of a pandemic on mental health

While there is evidence indicating that disasters can exacerbate symptoms and incidence of mental illness, there has been limited research on the psychological effects of epidemics and pandemics on mental health. Existing studies have primarily focused on frontline healthcare professionals and the psychological toll of managing disease-related morbidity, such as parents of children with congenital Zika virus syndrome. However, little is understood about the psychological impact of pandemic response measures, including quarantine, physical distancing, and stay-at-home orders. A small-scale study conducted during the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak in Toronto found an increase in symptoms of post-traumatic stress disorder and depression among individuals who were voluntarily quarantined. Previous research on post-disaster mental health has primarily examined the effects of natural disasters (e.g., earthquakes), traumatic events (e.g., attacks like those on the World Trade Center), and environmental disasters (e.g., Chernobyl nuclear power plant incident).

## Discussion and Conclusion

To the best of our knowledge, our study was the first to develop a COVID-19-specific stigma scale, comprising three distinct subscales. The stability of the three-factor structure was confirmed in terms of composition, measurement, and structural invariance, with no significant differences observed in factor means across gender and age groups. Each of the three subscales derived from the factor analysis exhibited unique associations with other variables.

Stigmatization of illnesses and those affected by them is a prevalent attitude observed across various contexts, often manifested through avoidance behaviours towards the perceived source of the illness. However, identifying the target disease can be challenging if it lacks easily detectable symptoms or signs, as seen with COVID-19, which may present with subclinical infections [9]. Consequently, there is a general apprehension surrounding approaching an unidentified source of infection, reflected in the concept of omnidirectional avoidance.

Furthermore, media reports have led individuals to associate certain groups, such as those working in bars, restaurants, hospitals, and clinics, with a higher likelihood of being COVID-19 positive. Consequently, individuals may purposefully avoid interactions with these groups, demonstrating attribution avoidance.

Lastly, the fear of contagion may manifest as hostility towards those who have contracted and subsequently recovered from COVID-19. Some individuals may harbor resentment towards recovered individuals, viewing them as irresponsible for potentially spreading the virus. This hostility may extend to demands for apologies or ostracization, highlighting the concept of hostility within the stigma scale [10].

While these three factors are interrelated to some extent, they remain independent constructs. However, limited evidence exists regarding the factors influencing mental health status at the population level during the COVID-19 pandemic. A systematic review and meta-analysis investigating factors associated with mental distress in the general population found that factors such as gender, age, and socioeconomic status were significant determinants of anxiety and depression levels.

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## Conflict of Interest

None

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