Caste and COVID-19: Psychosocial Disparities amongst Rural Indian Women during the Coronavirus Pandemic

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Abstract

The COVID-19 pandemic has exacerbated preexisting mental health disparities. In India, marginalization based on caste membership, gender, and rural residence are critical determinants of inequity across the lifespan. Guided by the theoretical frameworks of minority stress and intersectionality, this study examined caste-based disparities in fear of coronavirus, mental health symptoms, and perceived loneliness amongst rural women in north India during the COVID-19 pandemic. Participants (N= 316) completed self-report measures and were classified into three groups based on their responses: General Caste (GC, n = 124), Other Backward Castes (OBC, n = 122), and Scheduled Caste or Tribe (SC/ST, n = 71). Using a three-way ANOVA and Tukey t-tests, women in SC/ST and OBC groups reported greater fear of coronavirus (OBC d = 0.37; SC/ST d = 0.40) and greater mental health symptoms (OBC d = 0.58; SC/ST d = 0.43) relative to the GC group. OBC, but not SC/ST, group also reported higher perceived loneliness (d = 0.32). The results were consistent after adjusting for demographic variables such as wealth and highlight caste as an important social determinant for well-being during the COVID-19 pandemic amongst rural Indian women.

Keywords: Caste, COVID-19, India, Mental Health, Fear of Coronavirus, Intersectionality

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The COVID-19 pandemic has amplified preexisting disparities globally, such that historically marginalized communities have experienced worse psychosocial outcomes due to systemic inequities (Fulcher & Dinella, this issue). This has been particularly challenging in India, where the devastation from the pandemic has been extensive (Pickard et al., 2020). As of January 2022, more than 35 million people have been infected, and nearly half a million deaths were reported, though experts contend that the actual figure is likely much higher (The New York Times, 2022). The imposition of an initial national lockdown between March and June 2020 created significant economic and mental health burdens across the population (Agoramoorthy & Hsu, 2021) and was followed by a gradual reopening between June and December 2020 when cases were relatively low (The Indian Express, 2021; The New York Times, 2022). However, additional regional lockdowns triggered by subsequent surges in cases created a continuous sense of uncertainty throughout the pandemic (Agoramoorthy & Hsu, 2021). Prospective studies examining mental health in India before and during the pandemic suggest that the onset of D-19 has negatively impacted mental health (Manjareeka & Pathak, 2020; Saraswathi et al., 2020).

However, the health and socioeconomic effects have not been equally distributed between gender groups. While gender inequality existed before the pandemic (Batra & Reio, 2016), it has been suggested that the pandemic has magnified this divide (Agarwal, 2021). Research thus far has demonstrated that during the pandemic, relative to men, women in India have a higher COVID fatality rate (Dehingia & Raj, 2021), are more likely to experience food insecurity (Agarwal, 2021), are less likely to be employed during the pandemic (Deshpande,

2020), are more likely to engage in high-risk (e.g., frontline healthcare worker) or stigmatized (e.g., trash picking) employment without receiving minimum wage (Chakraborty, 2020) and experience worse mental health outcomes (Pinchoff et al., 2020). Evidence from prior epidemics around the world also suggests differential health outcomes across genders. For example, research during the Ebola outbreak in West Africa demonstrated that women were particularly at risk of infection because of their role as primary caretakers in their homes, whereby women are typically responsible for caring for the infirm (Menéndez et al., 2015).

While gender disparities have been examined in India, less attention has been paid in the social science literature on disparities experienced by women living at the intersection of gender and other marginalized socio-cultural identities. Overlapping marginalized identities have the potential to create disparate outcomes that are greater than the sum of those identities (Crenshaw, 1991), and studies in other contexts such as the United States have found that women with multiple minority identities experience worse health (Le & Nguyen, 2021; Garland McKinney et al., this issue; Rushovich et al., 2021) and socioeconomic (Modarressy-Tehrani, 2020; Ibekwe-Okafor et al., this issue) outcomes. In India, caste membership has been found to be a critical determinant of inequity across the lifespan (Human Rights Watch, 2001). Being a member of a perceived low-caste group is associated with lower life expectancy (Kumari & Mohanty, 2020), lower income (Desai & Dubey, 2012), greater experiences of discrimination (Khubchandani et al., 2018), higher exposure to intimate partner violence (Dalal & Lindqvist, 2012), greater barriers in accessing healthcare (Baru et al., 2010; Shaikh et al., 2018) and worse education outcomes (Desai & Dubey, 2012). Additionally, living in a rural community in India creates an added burden as compared to urban areas (Antony & Laxmaiah, 2008; Balasubramanian et al., 2021). There is a substantial gap between rural and urban areas in India across economic,

educational, and health outcomes (Antony & Laxmaiah, 2008). Recent economic analysis has found that, on average, individuals living in rural India have half the income relative to those residing in urban areas, and the income divide is continuing to widen (Balasubramanian et al., 2021). Drawing on minority stress theory (Carter, 2007; Meyer, 2003) and the theory of intersectionality (Crenshaw, 1991), the present study aims to examine if caste membership might play a role in the psychosocial impact of the COVID-19 pandemic amongst rural women in India.

Marginalization and Stress based on Multiple Intersecting Identities: A Theoretical Framework

Minority stress theory has predominantly been applied to understand the experiences of sexual (Meyer, 2003) and racial (Carter, 2007) minorities in Western countries. This theory proposes that pervasive experiences of discrimination can lead to excessive social stressors, which may explain worse mental health within minority populations. To our knowledge, the theory has not been applied to understand experiences of marginalization rooted in the caste system in India. However, there are several reasons, as outlined below, to suggest that it may be appropriate to consider in the present context.

Caste System in India

Isabel Wilkerson (2020) defines a caste system as:

> a fixed and embedded ranking of human value that sets the presumed supremacy of one group against the presumed inferiority of other groups on the basis of ancestry and often immutable traits, traits that would be neutral in the abstract but are ascribed life-and-death meaning in a hierarchy favoring the dominant caste, whose forebears designed it. A

> caste system uses rigid, often arbitrary boundaries to keep the ranks apart, distinct from one another and in their assigned places. (p. 29)

Wilkerson (2020) goes on to describe that a caste system is often rationalized as part of a divine plan or as the natural order of human life and, once embedded, becomes a deeply held schema influencing an individual's automatic assessments about the world and their place in it. One of the oldest surviving social hierarchies in the world, the caste system in India is a complex social and class structure where individuals are classified into groups on the basis of family of origin (Desai & Dubey, 2012; Human Rights Watch [HRW], 2001).

The Indian caste system was codified by a series of religious and legal Hindu texts in the early part of the first millennia of the Common Era and consisted of four broad hierarchical divisions in the society: *Brahmins* (teachers and clerics), *Kshatriyas* (kings and soldiers), *Vaishyas* (merchants) and *Shudras* (artisans and manual workers). Later a fifth division, considered to be outside the caste system, known as untouchables or *Dalits*, was added (Chakravarti, 2018; Vaid, 2014). A dominant theory in the understanding of the caste system in India suggests that it is grounded on the twin concepts of purity and pollution, whereby in order to protect the purity of the higher castes, typically considered to be the Brahmins, Kshatriyas, and Vaishyas, elaborate rules were created to limit social interaction between caste groups. These restrictions include restriction of intergroup marriage and socialization and restriction of stigmatized occupations (e.g., manual scavenging) to low-caste groups (Bidner & Eswaran, 2015; Chakravarti, 2018; Vaid, 2014). For example, in one part of India, untouchables were required to maintain social distance from brahmins as even a shadow of an untouchable person casting upon a brahmin could be considered polluting (Chakravarti, 2018). In order to enforce

these norms, high-caste communities used a range of punishments for violators, such as violence, ostracization, and ex-communication (Bidner & Eswaran, 2015; Chakravarti, 2018; Pal, 2015).

Upon independence from British Rule in 1947, India legally abolished the caste system and, in order to provide affirmative action to historically marginalized communities, developed a classification system with four groups: *Scheduled Castes* (SCs), which refers to Dalits, *Scheduled Tribes* (STs), refers to the aboriginal people of India who typically dwell in remote and inaccessible parts of the country, *Other Backward Classes* (OBCs), refers to a disparate group of communities considered to be historically marginalized consists predominantly of *Shudra* division, and *General Caste* (GC) refers to all high-caste groups (Vaid, 2014). However, despite the legal prohibition on discrimination based on caste, social norms, particularly in rural regions, often lead to complete segregation and ostracization of low-caste populations (HRW, 2001).

The Intersection of Caste, Gender, and Rural Residence

Current and historical socio-institutional structures continue to reinforce systemic inequities based on caste and other marginalized identities (Chakravarti, 2018; Vaid, 2014). For example, through its gender-based economic and endogamy (marriage only within caste) restrictions, the caste system depends on the subjugation of women and has aggravated the oppression of women relative to what they might have suffered under a more traditional patriarchal system (Bidner & Eswaran, 2015; Chakravarti, 2018). *The Code of Manu*, considered the most authoritative religious-legal text of ancient India, states that for a woman, "…nothing must be done independently, even in her own house. In childhood, a female must be subject to her father, in youth to her husband, when her [husband] is dead to her sons; a woman must never be independent"(Bühler, 1886, p. 147). The legal and religious proposition that men are inherently

superior to women has been suggested to create a social reality whereby women internalize and unwittingly participate in their own oppression and the oppression of those considered to be lower-caste (Bidner & Eswaran, 2015; Chakravarti, 2018). Low-caste women experience the oppression of patriarchy in their homes and caste in their communities, leading to unique lived experiences (Chakravarti, 2018).

Gender and caste-based inequities are particularly amplified in rural India (Chakravarti, 2018; Crenshaw, 1991). A recent study across rural India has found that higher castes do not allow low-caste individuals to enter their homes, and low-caste children regularly sit separately in school from their high-caste peers (Thomas et al., 2013). These acts of segregation also extend to public health workers, who regularly refrain from entering the homes of low-caste community members (Thomas et al., 2013). Khubchandani et al. (2018) found that independent of socioeconomic status, low-caste women in rural areas experience greater levels of discrimination relative to high-caste communities and are also more likely to accept it as a fact of life. That said, some low-caste women have also pushed back against caste-based inequities through media exposure, legal channels as well as organizing efforts coordinated by self-help groups (Chakravarti, 2018). However, the hierarchical caste system is pervasive, and evidence suggests that it has generally been strongly internalized. For example, in an experimental study, Hoff and colleagues (2011) found that low-caste individuals were less likely to punish high-caste members who inflict harm on fellow caste members relative to when the situations were reversed, and high-caste members punish low-caste individuals.

Low-caste women are at a particular disadvantage in terms of access to healthcare and education (Haq, 2013) and greater exposure to violence, particularly in rural areas (Krishnan, 2005). Furthermore, low-caste women in rural areas experience greater vulnerability to sexual

violence as high-caste men may utilize it as a social instrument to maintain their subjugation over low-caste communities (Bhagavatheeswaran et al., 2016; Pal, 2015, 2018). Given the pervasive and internalized discrimination, which is particularly prominent in rural areas, it is likely that low-caste women experience an adverse social environment that may contribute to worse mental health, especially in the context of a pandemic where preexisting inequalities are magnified (Agoramoorthy & Hsu, 2021).

Current Study

Drawing on minority stress theory and the theory of intersectionality, the present study aims to examine caste-based disparities in mental health outcomes in India during the COVID-19 pandemic. Specifically, we assess if women in low caste communities (SC/ST and OBC groups) experience a greater fear of coronavirus (FOC), worse mental health, and higher loneliness relative to women in general-caste communities in a rural district in North India.

Fear of Coronavirus

During an infectious pandemic, fear can be both beneficial and detrimental (Broche-Pérez et al., 2020). Fear of infection has been used by public health officials as an essential mechanism to drive compliance with pandemic-related restrictions and can be effective in creating greater adherence to precautions (Jiwani et al., 2021). Nonetheless, fear has also been found to be associated with adverse effects. Specifically, FOC has been found to be associated with worse anxiety outcomes in India, though the causality and directionality of the association have not been established (Srivastava et al., 2020). Additionally, research into the Ebola outbreak in West Africa found that fear of infection was associated with behavioral outcomes which can exacerbate the public health risk such as lower utilization of services which can lead to increased risk of distress, faster spread of disease, and a greater likelihood of death from infection

(Massaquoi et al., 2021; Shultz et al., 2016). In India, members of low-caste communities are potentially at risk of experiencing greater FOC, in part due to stigma as some government officials, including senior members of the ruling Bharatiya Janata Party, have blamed low-caste groups for spreading COVID-19 (Ganguly, 2020; Islam et al., 2021). Women in India have been found to be at a greater risk of FOC (Doshi et al., 2020), but to our knowledge, caste-based disparities in FOC in rural India remain unexamined.

Mental Health and Loneliness

Research in India has indicated that pandemic-induced lockdowns have been associated with elevated levels of loneliness (Dsouza et al., 2020; Iqbal & Dar, 2020) and worse mental health (Shukla & Manohar Singh, 2021) across the population. However, women in low-caste women may be at a greater risk for worse mental health outcomes and higher perceived loneliness relative to high-caste women. Prior research has found that low-caste women have been found to experience greater social exclusion (Pal, 2015), greater job loss (Deshpande, 2020), and greater barriers to healthcare (Haq, 2013) and thus may experience both worse mental health and higher loneliness. However, no study to our knowledge has empirically examined the role of caste-based disparities in the mental health outcomes during the pandemic in a sample of rural Indian women.

We hypothesize that women in SC/ST and OBC groups will experience greater FOC, worse mental health, and higher perceived loneliness relative to women in the General Caste group. We expect that this difference will be robust even when accounting for sociodemographic factors.

Method

Setting and Procedure

Data utilized in this study was part of a larger effort to understand the associations between trauma and self-efficacy amongst women in Bahraich District in the northern Indian state of Uttar Pradesh, with results published elsewhere (blinded). Women were recruited in person through community centers and schools as well as over the phone using a snowball sampling method. Due to an error in data collection procedures, women who were approached but did not consent were not tracked. All questionnaires were administered in Hindi. To ensure fidelity of the items, an adaptation protocol was followed whereby items were translated into Hindi and back-translated into English by two separate translators (Cha et al., 2007). Additionally, the questionnaires were reviewed by local members of a partner non-profit organization assisting in data collection to ensure that items were linguistically accurate given the regional dialect and culturally relevant. Data were collected between September and November 2020, and informed consent was collected orally from all participants. All procedures and questionnaires were approved by the (blinded) Institutional Review Board.

Participants

Three hundred and sixteen women between the ages of 18 and 40 years (M = 26.72, SD = 4.81) consented to participate in the survey. Women were interviewed in their homes, and public health protocols (such as wearing masks and maintaining social distancing) were put in place to ensure the safety of the interviewers and participants. In terms of caste affiliation, the largest group of women in the sample belonged to the General Caste (GC, 39.1%, n = 124), 38.5% identified as Other Backward Castes (OBC, n = 122), 19.9% as Scheduled Caste (SC, n = 63) and 2.5% as Scheduled Tribes (ST, n = 8). Nationally, 30.8% of the population belongs to GC, 41.1% is associated with OBC, and 28.2% is described as SC/ST (Directorate of Census Operations, 2014). All women reported being married, and a significant portion of the sample

(46.8%, n = 148) reported being unable to read or write, which is lower than the district illiteracy rate (60.8%) for all women reported in 2011 (Nazneen & Nakhat, 2014).

Measures

Fear of Coronavirus (FOC). Fear of Coronavirus was assessed using an eight-item scale adapted from the Fear of COVID-19 Scale (e.g., "I am afraid of losing my life because of coronavirus"; Ahorsu et al., 2020). Items were rated on a five-point scale (1 "Strongly Disagree" to 5 "Strongly Agree"). Possible scores ranged from 8 to 40 and were tabulated by summing the responses to each item, with higher scores indicating greater FOC. The scale has been used in India previously with good internal consistency (Bharatharaj et al., 2021; Lathabhavan, 2021) and demonstrated high internal consistency in the present study (Cronbach's alpha [α] = .92).

Depression, Anxiety and Stress Scale (DASS). General mental health was assessed using the 21-item DASS (Lovibond et al., 1995). The scale is used to assess depression (e.g. "I felt that I had nothing to look forward to") anxiety (e.g. "I felt I was close to panic") and stress (e.g. "I tended to over-react to situations"). Each subscale had seven items and the items were rated on a four-point scale (0 "Did not apply to me at all" to 4 "Applied to me very much or most of the time"). Possible scores ranged from 0-21 for each subscale and 0-63 for the entire scale and were tabulated by summing the responses to each item, with higher scores indicating worse mental health. The scale has been used in India previously with good internal consistency (Kumar et al., 2019; Verma & Mishra, 2020). Good internal consistency was demonstrated for the present sample across depression (α= .84) anxiety (α = .81) and stress (α = .84) subscales and the entire scale (α1 = .93).

Perceived Loneliness. Loneliness was assessed using the eight-item UCLA Loneliness Scale (UCLA-8, Hays & DiMatteo, 1987) (e.g., "I feel isolation from others"). Items were rated

on a four-point scale (1 “Never” to 4 “Often”). Possible scores ranged from 8 to 32 and were tabulated by summing the responses to each item, with higher scores indicating greater loneliness. The scale has been used in a South Asian context previously (Das et al., 2021) and demonstrated acceptable consistency in the present study ($\alpha = .81$).

Demographics. Demographic information collected included age, caste affiliation, literacy, and marital status. Given the difficulty of assessing income in rural India, a wealth index was calculated using the house type and the number of rooms in the home. The physical characteristics of a home have been used as a stand-in for wealth by the Indian government (Census of India, 2011) and researchers (Kattula et al., 2016). In terms of caste, we grouped women into three divisions: GC, OBC, or SC/ST. The latter two were combined due to only eight participants reporting being part of ST, and SC and ST groups have been combined in other studies as well (Khubchandani et al., 2018). Finally, prior research from India suggests that age (Kazmi et al., 2020; Sanjana & Raghavan, 2020; Venugopal et al., 2020), literacy (Srivastava et al., 2020), and wealth (Sathe et al., 2020) were associated with FOC, mental health or loneliness. Thus, we included these demographic factors as covariates in our main analyses.

Analytic Strategy

Analyses were conducted in Jamovi (The Jamovi Project, 2021) and R (R Core Team, 2022). Variable normality and scale reliability were assessed, and Pearson correlations were used to examine associations between covariates and dependent variables. An analysis of variance (ANOVA) approach was used to assess whether significant group differences were present in mental health, FOC, and perceived loneliness. General Caste was used as the reference group and OBC and SC/ST groups were assessed as comparison groups. If the F statistic was significant, post hoc Tukey tests were conducted, and estimated marginal means were calculated.

Additionally, multiple regression models that included demographic covariates were used for conducting sensitivity analyses to assess the robustness of the findings. Effect sizes for t-tests were assessed using Cohen's d with emmeans package (Lenth et al., 2022) and standardized betas for multiple regression were calculated using lm.beta package (Behrendt, 2022).

Results

The variables met assumptions of normality based on skewness and kurtosis cutoffs between -2 and +2 with the exception of the wealth index, which had a kurtosis (2.37, SE = .273) which was slightly higher than the cutoff (George & Mallery, 2019). Means, standard deviation, and frequencies of the dependent variables and covariates by caste group are reported in Table 1. Correlations between primary variables and covariates are reported in Table 2. As expected, the three primary variables – FOC, mental health, and loneliness – were correlated with each other.

Caste Differences in Fear of Coronavirus

The first hypothesis was that women in low-caste communities are likely to experience greater FOC than those in the general caste. An ANOVA was conducted to assess the mean difference in FOC across caste groups. There was a significant main effect of caste- membership on FOC, $F(2,313) = 5.43$, $p = .005$. Fully supporting the hypothesis, post hoc analysis using Tukey tests suggested FOC was significantly higher in the OBC group versus the GC group ($M_{diff} = 2.81$, $SE = .98$, $p_{tukey} = .012$, Cohen's $d = 0.37$) and higher in SC/ST group relative to the GC group ($M_{diff} = 3.05$, $SE = 1.14$, $p_{tukey} = .021$, Cohen's $d = 0.40$). No significant difference was found between SC/ST groups and OBC ($M_{diff} = 0.23$, $SE = 1.14$, $p_{tukey} = .977$, Cohen's $d = 0.03$). See Figure 1a for differences in estimated marginal means.

A follow-up multiple regression analysis with FOC as the dependent variable and caste membership and demographic variables (age, literacy, and wealth) as independent variables was

conducted to assess the sensitivity of the results. All variables were included simultaneously. The model was found to predict significant variation in FOC, R^2 =.07, $F(5,309) = 5.64$, $p < .001$. Using GC as the reference group, OBC ($\beta = .22$, $p < .001$) and SC/ST ($\beta = .21$, $p < .001$) group memberships were significantly associated with greater fear of coronavirus. Additionally, a significant association was seen between wealth and FOC, such that greater wealth was associated with higher FOC ($\beta = .19$, $p < .001$). Neither age nor literacy significantly predicted FOC. See Table 3 for the regression results.

Caste Differences in Mental Health Symptoms

The second hypothesis was that low-caste women were more likely to experience worse mental health relative to high-caste women. Group differences were assessed using an ANOVA and found to be significant, $F(2,313) = 10.8$, p < .001. Fully supporting the hypothesis, post hoc Tukey t-tests suggested that mental health symptoms as assessed by DASS were significantly higher in the OBC group versus the GC group ($M_{diff} = 5.53$, $SE = 1.22$, $p_{tukey} < .001$, Cohen's $d = 0.58$) and higher in the SC/ST group relative to the GC group ($M_{diff} = 4.16$, $SE = 1.42$, $p_{tukey} = .010$, Cohen's $d = 0.43$). No significant difference was found between the SC/ST and OBC groups $M_{diff} = -1.37$, $SE = 1.43$, $p_{tukey} = .603$, Cohen's $d = -0.14$). See Figure 1b for differences in estimated marginal means.

Group differences were also analyzed by subscales using ANOVA. Significant differences were found for depression, $F(2, 313) = 7.6$, $p < .001$, anxiety, $F(2,313) = 10.7$, $p < .001$, and stress, $F(2,313) = 10.8$, $p < .001$. Posthoc tukey t-tests found that depression symptoms were greater for OBC women relative to GC ($M_{diff} = 1.68$, $SE = 0.43$, $p_{tukey} < .001$, Cohen's $d = 0.50$), but no differences were found between SC/ST and GC ($M_{diff} = 0.91$, $SE = 0.50$, $p_{tukey} = .170$, Cohen's $d = 0.27$) or between OBC and SC/ST ($M_{diff} = -0.78$, $SE = 0.50$, $p_{tukey} = .274$,

Cohen's d = -0.23) groups. Anxiety symptoms were higher for both OBC (M_{diff} = 1.66, SE = 0.40, p_{tukey} < .001, Cohen's d = 0.53) and SC/ST (M_{diff} = 1.65, SE = 0.46, p_{tukey} = .001, Cohen's d = 0.53) groups relative to GC. No significant differences in anxiety symptoms were found between OBC and SC/ST groups (M_{diff} = -0.00, SE = 0.46, p_{tukey}= .999, Cohen's d = 0.00). Finally, stress symptoms were also greater for OBC (M_{diff} = 2.19, SE = 0.48, p_{tukey} < .001, Cohen's d = 0.58) and SC/ST (M_{diff} = 1.60, SE = 0.56, p_{tukey}= .013, Cohen's d = 0.42) groups relative to GC. No significant differences in stress symptoms were found between OBC and SC/ST groups(M_{diff} = -0.59, SE = 0.56, p_{tukey} = .547, Cohen's d = -.16).

A follow-up multiple regression analysis with overall mental health symptoms as the dependent variable and caste membership and demographic variables (age, literacy, and wealth) as independent variables was conducted to assess the sensitivity of the results. The model was found to predict significant variation in mental health symptoms, R^2 =.07, F(5,309) = 5.37, p<.001. Using GC as the reference group, OBC (β = .27, p < .001) and SC/ST (β = .17, p = .007) group memberships were found to be associated with higher mental health symptoms. None of the demographic variables were significantly associated with mental health symptoms. See Table 3 for the regression results.

Perceived Loneliness

The third hypothesis was that low-caste women were likely to experience greater perceived loneliness relative to women in GC group. Group differences were assessed using an ANOVA and found to be significant, F(2,313) = 3.23, p = .041. Partially supporting the hypothesis, post hoc Tukey test indicated that perceived loneliness was significantly higher in the OBC group versus the GC group (M_{diff} = 1.15, SE = 0.60, p_{tukey} = .032, Cohen's d = 0.32). However, no significant difference was observed between GC and SC/ST groups (M_{diff} = 0.62,

SE = 0.70, p_{tukey}= .649, Cohen's *d* = 0.13) or between SC/ST and OBC groups (M_{diff} = -0.89, *SE* = 0.70, p_{tukey} = .41, Cohen's *d* = -0.19). See Figure 1c for differences in estimated marginal means.

A follow-up multiple regression analysis with loneliness as the dependent variable and caste membership and demographic variables (age, literacy, and wealth) as independent variables was conducted to assess the sensitivity of the results. The model was predictive of loneliness, R^2 =.04, $F(5,309) = 2.72$, p=.020. Using GC as the reference group, OBC was associated significantly with greater perceived loneliness (β = .16, p = .007) but SC/ST was not (β = .15, p = .312). There was a significant negative association between literacy and perceived loneliness, such that those who were literate experienced less perceived relative to those who reported being illiterate (β = -.13, p = .021). Age and wealth were not significantly associated with perceived loneliness. See Table 3 for the regression results.

Discussion

To our knowledge, this is the first study to empirically examine caste-based disparities in mental health outcomes during the COVID-19 pandemic in a sample of rural Indian women. Prior research has found that the caste system in India is a critical determinant of inequity across the lifespan, such that low-caste communities tend to have worse socioeconomic and health outcomes (Baru et al., 2010; Bhagavatheeswaran et al., 2016; Dalal & Lindqvist, 2012). Furthermore, research examining the intersection of caste and gender in India has found that low-caste women are at a particular disadvantage (Haq, 2013; Krishnan, 2005; Pal, 2018) and evidence suggests that the COVID-19 pandemic has exacerbated the impact on vulnerable groups such as low-caste women in India (Agoramoorthy & Hsu, 2021). Drawing on the theories of minority stress and intersectionality, we hypothesized that caste-based disparities in fear of

coronavirus, mental health, and loneliness would be demonstrated in a sample of women in a rural north Indian district.

Based on the data collected during the early phase of the pandemic (September-November 2020), the first hypothesis that women in SC/ST and OBC communities would experience greater FOC was fully supported. Both SC/ST and OBC groups reported experiencing worse FOC relative to individuals identifying as GC. These findings held when accounting for demographic factors. While fear may be an important tool to drive compliance with COVID-19 regulations, FOC has been associated with worse mental health outcomes (Srivastava et al., 2020) and greater instances of deaths by suicide (Dsouza et al., 2020) in India. Particularly amongst low-caste women who face significant burdens associated with intersectional minority identities, FOC may be an outcome of stigma and the experience of feeling blamed for the spread of the COVID-19 pandemic (Islam et al., 2021). Based on the principles of purity and pollution of the Indian caste system, low-caste communities are considered less hygienic (Doron, 2016), and thus, some high-caste individuals have held them responsible for spreading the virus. Furthermore, caste-based norms and economic disparities may also play a role in creating greater FOC. Low-caste communities may have less access to water due to caste-based segregation or economic disadvantage and may not be able to afford practices such as frequently washing hands with soap. The difficulty in following such public health recommendations may lead to a greater experience of FOC (Mondal & Karmakar, 2021).

Caste-based disparities were also found in psychological distress, even when controlling for demographic factors. This finding builds on a study from Gupta & Coffey (2020) which utilized data collected from the World Health Organization from six states (Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal) and also found worse mental health for

SC communities relative to high-caste individuals prior to the pandemic in a dataset of 10,125 individuals. However, the effect sizes from the Gupta & Coffey (2020) study (Cohen's d = 0.05 - 0.07) were smaller than the effect size in the present study (Cohen's d = 0.43 - 0.58). Although this is only one pre-COVID point of comparison, the difference in magnitude supports the possibility the pandemic may have magnified the disparity. This finding also mirrors the broader literature suggesting that marginalized communities have experienced worse health outcomes during the pandemic (Fulcher and Dinella, this issue). It should be noted that when examining individual subscales, anxiety and stress were found to be greater in both OBC and SC/ST groups relative to GC but depression was only significantly higher in OBC. This difference may be due to the possibility that the historical marginalization and collective resistance of the SC and ST communities has created stronger social cohesion relative to the OBC group, which are more disparate, thereby keeping depressive symptoms at bay (Chakravarti, 2018; Hoelscher et al., 2012). Poor mental health can have physical health consequences, including lowering life expectancy (Cullen et al., 2020). Given the historic systemic inequity and social exclusion experienced by low-caste communities in India (Bidner & Eswaran, 2015; Chakravarti, 2018), it is possible that a range of factors from the individual to the systemic level might play a role in mental health challenges for OBC and SC/ST women relative to GC women in this sample. Future research might examine systemic level factors associated with worse mental health for members of low-caste communities, such as access to basic services, including healthcare, water, and education.

The third hypothesis was that low-caste communities would experience greater perceived loneliness was partially supported as OBC group membership was associated with greater loneliness relative to GC, although SC/ST group membership was not. Similar to findings related

to the depression subscale, this difference may be due to the collective resistance and social cohesion of the SC and ST communities (Chakravarti, 2018; Hoelscher et al., 2012) or it may be related to other factors such as family structure and religious practices, which have been associated with loneliness in India and unmeasured in this study, might be playing a larger role relative to group differences (Hossain et al., 2020). That said, greater loneliness for OBC groups is still a cause for concern as loneliness has been associated with suicidality in India (Dsouza et al., 2020) as well as worse health outcomes in a number of other contexts (Dahlberg, 2021; Holt-Lunstad et al., 2010; Killgore et al., 2020).

In addition to caste-based disparities, regression analyses indicated that some demographic characteristics aside from caste were associated with the outcomes of interest. Interestingly, wealth was positively associated with FOC ($\beta = .19$). One possible reason for this association might be exposure to formal media. Wealthier individuals may have greater access to media sources (Tharoor, 2017), and in India, formal media has been found to provide sensational coverage of pandemics such as COVID-19 and H1N1, which may lead to elevated levels of FOC for wealthier individuals (Mukherjee et al., 2021; Sharma et al., 2020). Additionally, literacy was found to be negatively associated with loneliness ($\beta = -.13$). This association confirms prior research in India, which found that women who were illiterate were at a higher risk for loneliness (Anil et al., 2016). It has been suggested that illiteracy might be correlated with other factors such as lower self-esteem, lower self-worth, or a smaller social network, with the association between loneliness and illiteracy potentially explained by the aforementioned factors (Zhong et al., 2018).

Theoretical Integration

The findings from the study in conjunction with other studies on caste-based disparities (Bhagavatheeswaran et al., 2016; Gupta & Coffey, 2020; Khubchandani et al., 2018; Pal, 2018) suggest that minority stress and intersectionality theories may be applicable in the context of low-caste women, particularly in rural India. In terms of minority stress theory, one implication might be that caste-based stressors are unique, chronic, and based on existing societal normative structures (Meyer et al., 2008) and extend across the lifespan (Dispenza et al., 2016). From an intersectionality perspective, an important implication might be that for low-caste women, there are multiple layers of marginalization that must be addressed in research and policy (Al-Faham et al., 2019; Chakravarti, 2018). A one-size-fits-all approach (i.e., assuming all women are similar or all low-caste individuals are the same) will not lead to the necessary understanding or subsequent changes needed to create greater health and sociocultural equity (Hankivsky & Cormier, 2011).

Social Policy Implications and Recommendations

The findings have several implications for social policy. In the short-term, given that fear of infection has been found to be associated with lower use of services and faster spread of disease (Massaquoi et al., 2021; Shultz et al., 2016) and low-caste women are found to have greater FOC, public health officials must focus on improving access to information for this group to avoid the proliferation of the virus in low-caste communities and beyond. One potential delivery mechanism might be through engaging networks of women's self-help groups which have been effective in delivering financial services to women in low-caste communities (Deininger & Liu, 2009; Galab & Rao, 2003). More recently, self-help groups have also been found to be effective in delivering public health messages (Mehta et al., 2020) and thus could be used to deliver COVID-19-specific information. Delivering messaging through existing networks

would enable low-caste women to take charge and exercise agency rather than a top-down approach where low-caste women are passive recipients.

Additionally, as noted, greater FOC and worse mental health amongst low-caste women may be associated with the stigma of being blamed for spreading the virus (Islam et al., 2021; Pickard et al., 2020). In a field experiment, Islam and colleagues (2021) found that sharing accurate information about COVID through a brief phone call led to lower levels of stigmatization against low-caste communities. Thus, while it is important to provide information to low-caste communities, it is also important to provide accurate information to rural communities at large and particularly to high-caste groups to eliminate the stigma associated with marginalized groups. Finally, given the mental health challenges in low-caste groups, it may also be effective to utilize the existing infrastructure of community health workers – also known as Accredited Social Health Activists or ASHA workers – who have been utilized in delivering mental health services (Bansal et al., 2021; Rahul et al., 2021). ASHAs may be able to deliver basic mental health first aid to individuals who are experiencing distress and work to reduce stigma in both low and high-caste communities by providing accurate information.

In the long term, a systematic dismantling of existing institutions which support caste-based inequities may be necessary to eliminate the observed disparities. Low-caste communities must be guaranteed basic rights, including equitable access to education (Chauhan, 2008), health services (Baru et al., 2010), employment (Dunn, 1993), the police, and the judicial system (Chakravarti, 2018; Pal, 2018). Furthermore, as policies are developed at governmental, intergovernmental, and non-governmental institutions, the voices of low-caste women must be centered (Govinda, 2009). This is particularly important if the agenda equity is to be advanced in the long term.

Strengths, Limitations, and Future Direction

A strength of the current study is our focus on an understudied and vulnerable population and its identification of caste as an essential social variable for consideration when examining the psychosocial impact of the COVID-19 pandemic in India. Furthermore, by collecting data in person rather than online, this study reduced barriers associated with technology and literacy to ensure that the voices of marginalized communities are represented in research. However, there are limitations that must be acknowledged and considered when interpreting the results. First, the data are cross-sectional, and thus, applying causal inference is not possible. Future studies may consider longitudinal designs assessing the aforementioned factors over time. Importantly, with a lack of pre-COVID data in the same participants as a comparison, it is not possible to definitively conclude that COVID has increased caste-based disparities. Second, it is important to consider the context in interpreting the results. The sample was limited in geography (one district), and age range (18-40), and was collected using a snowball sampling method which did not lead to a representative sample. Additionally, the data were collected between September and November of 2020 when COVID cases in India were relatively low, especially when compared to May 2021, when average daily cases in India were reported to be averaging nearly 400,000 per day (The New York Times, 2022). Future research may assess if these outcomes hold in other regions of India, with a broader age range, and across multiple time points that include both peaks and valleys of the pandemic. Additionally, we did not collect data about beliefs, behaviors, and attitudes about the coronavirus, which may impact FOC. Future research may explore these questions and the impact of other factors such as disease prevalence and experiences of discrimination related to the coronavirus. Finally, future research may also consider exploring a strengths-based perspective to better understand how low-caste communities might be generating

solutions to the problems proposed. Collectively, continued empirical research in this area is likely to help scholars, and policymakers better understand the impact of the caste system during the pandemic and develop effective interventions to counteract this impact.

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Table 1

Means, Standard Deviations, and Frequencies for variables by Caste

Variable	**GC**		**OBC**		**SC/ST**	
	n (%)	*M (SD)*	*n* (%)	*M (SD)*	*n* (%)	*M (SD)*
n	124 (39.1)		122 (38.5)		71 (19.9)	
Literacy = Literate	60 (48.8)		66 (54.1)		42 (59.2)	
Participant Age		26.88 (5.07)		26.88 (5.08)		26.17 (3.77)
Wealth Index		9.82 (5.66)		7.49 (3.63)		7.18 (4.67)
Mental Health		7.39 (7.82)		12.92 (10.10)		11.55 (11.21)
Anxiety		2.07 (2.20)		3.72 (3.34)		3.72 (3.92)
Stress		2.95 (3.24)		5.14 (3.81)		4.55 (4.49)
Depression		2.37 (2.82)		4.06 (3.70)		3.28 (3.68)
Loneliness		18.38 (4.75)		19.89 (4.60)		19.00 (4.67)
Fear		22.28 (8.05)		25.09 (7.52)		25.32 (7.10)

Note. GC = General Caste, OBC = Other Backward Caste, SC/ST = Scheduled Caste or Scheduled Tribe. Mental Health is the composite results from the Depression, Anxiety and Stress (DASS) 21 scale. Anxiety, Stress and Depression are subscale scores.

Table 2

Correlations among covariates and study variables

	Participant Age	Wealth Index	Literacy	Fear	Mental Health	Depression	Anxiety	Stress	Loneliness	General Caste	OBC	SC or ST
Participant Age	—											
Wealth Index	-0.038	—										
Literacy	-0.174 **	0.024	—									
Fear	0.004	0.131 *	-0.052	—								
Mental Health	0.003	-0.136 *	-0.043	0.275 ***	—							
Depression	0.009	-0.136 *	-0.072	0.263 ***	0.945 ***	—						
Anxiety	0.029	-0.098	-0.029	0.287 ***	0.920 ***	0.821 ***	—					
Stress	-0.023	-0.144 *	-0.021	0.228 ***	0.939 ***	0.832 ***	0.781 ***	—				
Loneliness	-0.062	-0.022	-0.105	0.324 ***	0.591 ***	0.612 ***	0.539 ***	0.512 ***	—			
General Caste	0.034	0.289 ***	-0.066	-0.183 **	-0.249 ***	-0.198 ***	-0.253 ***	-0.248 ***	-0.123 *	—		
OBC	0.021	-0.155 **	0.012	0.107	0.198 ***	0.191 ***	0.160 **	0.201 ***	0.133 *	-0.634 ***	—	
SC or ST	-0.064	-0.157 **	0.063	0.089	0.060	0.008	0.108	0.055	-0.012	-0.429 ***	-0.425 ***	—

Note. * p < .05, ** p < .01, *** p < .001. GC = General Caste, OBC = Other Backward Caste, SC/ST = Scheduled Caste or Scheduled Tribe

Table 3

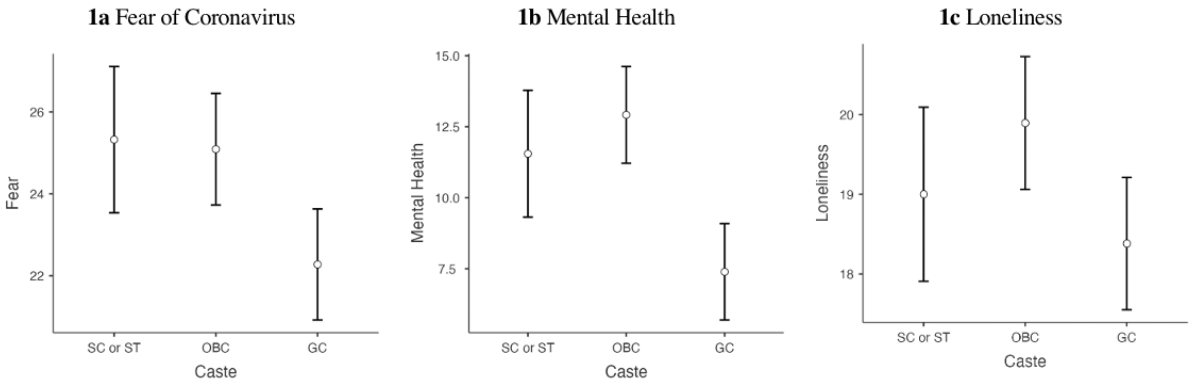
Multiple Regression Results for Fear of Coronavirus, Mental Health, and Perceived Loneliness

Predictor	*b*	*b* 95% CI [LL, UL]	*β*	Fit
		Fear of Coronavirus		
(Intercept)	-0.55	[-1.26, 0.16]		
Caste (OBC)	0.46***	[0.21, 0.71]	.22	
Caste (SC or ST)	0.51***	[0.22, 0.80]	.21	
Participant Age	0.00	[-0.02, 0.02]	.00	
Literacy (Literate)	-0.14	[-0.36, 0.08]	-.07	
Wealth Index	0.04***	[0.02, 0.06]	.19	
				R^2 = .071** 95% CI[.02,.12]
		Mental Health		
(Intercept)	-0.13	[-0.84, 0.58]		
Caste (OBC)	0.55***	[0.29, 0.80]	.27	
Caste (SC or ST)	0.41**	[0.11, 0.70]	.17	
Participant Age	-0.00	[-0.02, 0.02]	.00	
Literacy (Literate)	-0.12	[-0.34, 0.10]	-.06	
Wealth Index	-0.01	[-0.03, 0.01]	-.05	
				R^2 = .071*** 95% CI[.02,.12]
		Loneliness		
(Intercept)	0.38	[-0.34, 1.10]		
Caste (OBC)	0.35**	[0.10, 0.61]	.17	
Caste (SC or ST)	0.15	[-0.14, 0.45]	.06	
Participant Age	-0.02	[-0.04, 0.01]	-.07	
Literacy (Literate)	-0.26*	[-0.49, -0.04]	-.13	
Wealth Index	0.00	[-0.02, 0.03]	.01	
				R^2 = .042* 95% CI[.00,.08]

Note. *b* represents unstandardized regression weights. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively. *β* indicates standardized regression weights. * indicates p < .05. ** indicates p < .01, *** p < .001

Figure 1a-c

Plots depicting estimated marginal means for Caste Membership across FOC, Mental Health, and Loneliness



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