

Disability, Discrimination, and Mental Health during the COVID-19 Pandemic: A Stress Process Model

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Abstract

Drawing on data from a community survey with a sizeable subsample of people with physical, intellectual, and psychological disabilities in the Intermountain West region of the United States ($N = 2,043$), this investigation examined the association of social stressors stemming from the COVID-19 pandemic with ableism or disability-related discrimination. We further assessed the significance of these associations for variation by disability status in psychological well-being with a moderated mediation analysis. Study findings provide clear evidence that greater pandemic-related stressor exposure was associated with greater discrimination, which in turn increased the psychologically distressing aspects of the pandemic for people with disabilities relative to people without disabilities. This set of findings challenges us to think about how we engage in research concerning ableism and the proliferation of macro-level stressors such as those associated with the COVID-19 pandemic. The findings also support the application of a minority stress model in addressing mental health contingencies among people with disabilities—in this case, in examining the pandemic's psychological impact.

Keywords

discrimination, mental health, COVID-19, disabled people, stress process

INTRODUCTION

The social and economic realities of life during the COVID-19 pandemic have had profound psychological consequences (Gostin and Wiley 2020; Usher, Durkin, and Bhullar 2020; Vindegaard and Benros 2020), with several studies documenting a threefold increase in the prevalence of depression among U.S. adults since the pandemic began (Ettman et al. 2020; Okoro et al. 2021; Twenge and Joiner 2020). This spike in depressive symptomatology is partly driven by higher prevalence rates in the disability community (Ciciurkaite, Marquez-Velarde, and Brown 2022; Okoro et al. 2021; Pettinicchio et al. 2021). For example, further analysis of depression estimates for the U.S. population showed a 68 percent higher prevalence rate among people with disabilities

compared to people without disabilities in the first year of the pandemic (Okoro et al. 2021).

Disability and mental health scholarship has demonstrated that the comparably greater prevalence of depression or depressive symptoms among people with disabilities derives substantially from social marginalization and differential exposure to social stressors (Alang, McAlpine, and Henning-Smith 2014; Brown and Turner

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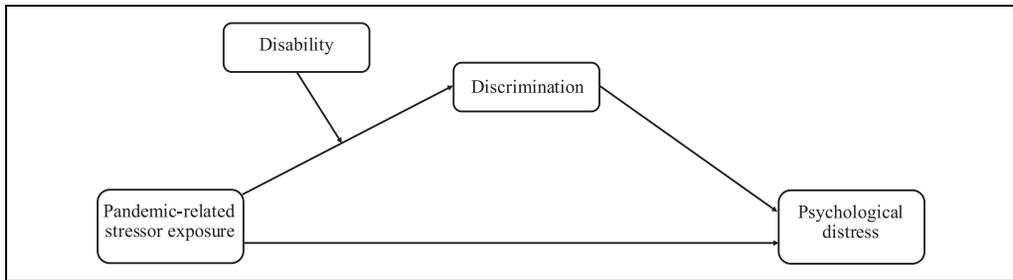


Figure 1. Conceptual model of the associations between disability, pandemic-related stressor exposure, discrimination, and psychological distress.

2010; Turner, Lloyd, and Taylor 2006). This is supported within the COVID-19 context by research demonstrating that people with disabilities have been more likely than people without disabilities to experience difficulties at work; at home; in personal, family, and social relationships; and related to health and health care access (Ciciurkaite et al. 2022; Landes et al. 2020; Okoro et al. 2021). But, the pandemic has also fueled existing biases that reinforce social and economic inequalities, which are further detrimental to the health and well-being of socially marginalized groups (Lee and Waters 2021). As an illustration, there is evidence of both greater economic precarity and increases in discriminatory treatment on the basis of race, gender, age, and education since the start of the pandemic (Daniali, Rahimi, and Salarvand 2022; Lee and Waters 2021; Perry, Aronson, and Pescosolido 2021). There has been no study to our knowledge, however, of whether pandemic-related strains have also increased discrimination toward people with disabilities, despite numerous commentaries expressing concern about prejudice and discrimination toward people with disabilities during the pandemic (e.g., Armitage and Nellums 2020; Goggin and Ellis 2020).

This study advances our understanding of pandemic precarity, discrimination, and mental health by investigating how pandemic-related stressors and discrimination contribute to differences by disability status in psychological distress. More specifically, we extend work on COVID-19 stressor exposure by considering discrimination as a conduit through which pandemic-related stressors associated with employment, household management, personal relationships, and social ties may be linked with psychological distress. The stress process model and concept of macro-level stress proliferation are used to conceptualize these linkages in the context of disability. These

perspectives encompass the notion that, for marginalized groups, shared traumas or events can produce additional burdens such as acute and chronic stressors and experiences of discrimination, and thus have a differential mental health impact (Brown et al. 2019; Pearlin and Bierman 2013). The novel application of these concepts presented in this paper advances a *systemic and dynamic* understanding of disability-related discrimination, or ableism, which is useful because it addresses both the sources of ableism and the inequalities that ableism creates, as well as the interactive processes linking them.

To apply these considerations to the COVID-19 context, we tested a hypothetical moderated mediation model in which the salience of discrimination (i.e., the mediator) for the association between pandemic-related stressors and psychological distress would be contingent on disability status (i.e., the moderator). The conceptual model presented in Figure 1 depicts the hypothesized associations. This model was tested with data from a community survey in the Intermountain West ($N = 2,043$) that included an oversampling of people with disabilities ($n = 1,020$). Here and throughout this article, unless noted otherwise, we use the term *disability* to refer to difficulties associated with physical, intellectual, behavioral, or psychological impairments, consistent with the World Health Organization's inclusive definition of disability and legal definitions used in federal and state policies (Barnes 2000). We use the term *psychological distress* to refer to depressive symptoms.

Disability, the Stress Process Model, and Minority Stress

Prior research on disability and depressive symptoms has often been guided by the stress process

model. This model recognizes that the social statuses individuals occupy influence their exposure to social stressors and the coping resources available to them, which, in turn, influence health (Aneshensel 2015; Pearlin 1989; Pearlin et al. 1981). Research in this tradition has typically conceptualized disability as a chronic strain which varies by social status along with other forms of stressor exposure (Alang et al. 2014; Turner et al. 2006; Turner and Noh 1988; Yang and George 2005). This is because stress research on the disability—depression association was significantly motivated by interest in psychological adjustment to aging and age-related disability (Turner and Noh 1988). Taking this measurement approach has been helpful in examining status variation in the extent to which level of functional disability predicts psychological distress, and in developing an understanding of the role of stress for the disability—distress association (Alang et al. 2014; Brown 2017; Brown and Turner 2010; Turner et al. 2006). However, treating disability as a symptom rather than a source of disadvantage has limited scholarly attention to the stressors that people with disabilities are more likely to experience as a group, and their mental health consequences (Brown 2017; Brown and Turner 2010). These limitations have further impeded our understanding of the processes through which disability, stressor exposure, and mental health operate.

As Monique Botha and David M. Frost (2020) note in their study on autism and mental health, increased recognition of disability as a minoritized identity or status supports the relevance of the minority stress model for this population. This extension of the classic stress process model acknowledges that marginalized groups are exposed to greater stress and tend to be resource-poor, and further considers stressors more common or unique to these groups (Meyer 2003). Such minority stressors function to maintain existing hierarchies or power and status yet represent an individual burden requiring greater adaptation among people occupying a minority status compared to those who do not occupy such statuses (Meyer 2003; Meyer and Frost 2013; Montazer 2020). For example, everyday discrimination, which is the routine unfair treatment of individuals or groups on the basis of some form of difference, is frequently studied as a minority stressor because it is a regularly occurring form of stress associated with social disadvantage contributing to worse health outcomes (Meyer and Frost 2013;

Thompson 2016; Williams et al. 2012). However, everyday discrimination does not occur in a vacuum—it is supported by and reinforces policies that limit resources for some groups, and the social and economic disparities they elicit (Taylor and Turner 2002; Williams et al. 2012).

Research on stress proliferation, or the tendency of stressors to produce additional stressors (Pearlin and Bierman 2013), demonstrates that marginalized groups also tend to experience more discrimination in association with stressful life events (Ajrouch and Antonucci 2018; LeBlanc, Frost, and Wight 2015; Turner, Brown, and Hale 2017; Williams et al. 2012; Williams et al. 1997). In the context of shared traumas or eventful stressors (i.e., macro-level stressors), there is indication that macro-level stressors tend to affect disadvantaged groups first, and worst, and encourage further marginalization (Brown et al. 2019). For example, on and immediately after 9/11, race/ethnic and religious minorities were more likely to be exposed to event-specific stressors such as losing a loved one, being injured during the attacks, or experiencing injury in subsequent recovery work; but, they also experienced greater mistrust and have been exposed to greater discrimination since that time (Brown et al. 2019; Shah 2019; Whealin et al. 2021). The Great Recession provides another illustration of macro-level stress proliferation. The recession posed a significantly greater financial shock for the economically disadvantaged versus advantaged, yet recovery efforts privileged the wealthy while introducing greater scrutiny and institutional challenges for those with fewer financial assets (Brown et al. 2019; Burgard and Kalousova 2015). The takeaway from these examples is that discrimination can be an indirect way in which macro-level stressor exposure impacts the health of minoritized individuals (Brown et al. 2019). Extending this consideration to disability and the COVID-19 context, a minority stress proliferation model suggests cascading effects of pandemic-related stressors and discrimination on the mental health of people with disabilities, as depicted in Figure 1.

Pandemic-related Stressors and Disability

This view is supported, first, by evidence that people with disabilities have been deeply affected by the pandemic. Arguably, the three most profound

effects of the pandemic are (1) experiencing the virus itself, (2) the transformation of the health care system, and (3) the experience of quarantine and related mitigation measures. With this in mind, it is first notable that people with disabilities are more likely to get sick—or sicker—with the virus: According to the Centers for Disease Control and Prevention (2021), people with disabilities “are three times more likely than adults without disabilities to have heart disease, diabetes, cancer, or a stroke,” which may put them at risk for more severe COVID-19-related health complications. There is also evidence that people with intellectual and developmental disabilities have contracted and died of COVID-19 at higher rates than people with other forms of disability or those who are not currently disabled (Landes et al. 2020; Turk et al. 2020).

The mobilization of health care resources in response to COVID-19 has further meant that many people with disabilities have gone without or with less routine medical care, and have disproportionately borne the brunt of widespread health care service disruptions (O’Connell, Eriks-Hoogland, and Middleton 2020). Relatedly, many people with disabilities have been placed at increased risk for COVID-19 infection, on one hand, due to the need for routine medical care or assistance for conditions not well-managed via telehealth or social distancing-compliant treatments and, on the other hand, due to health complications associated with canceled or skipped appointments and going without medications or medical devices (Drum, McClung Pasqualino, and Subramanyam 2020; Goggin and Ellis 2020; Kuper et al. 2020).

At the same time, there is evidence that quarantine measures have been most burdensome to people with disabilities in terms of social costs—in losses of employment, finances, personal relationships, and social lives (Ciciurkaite et al. 2022; Kuper et al. 2020; Maroto, Pettinicchio, and Lukk 2021; O’Connell et al. 2020). While people with disabilities have reported greater social isolation during the pandemic compared to people without disabilities (Ciciurkaite et al. 2022), they are also more likely to live in congregate living settings and similar housing accommodations in which they are less able to control when and how social interactions occur (Kuper et al. 2020; O’Connell et al. 2020). As a result, many people with disabilities have not been able to follow social distancing guidelines (Kuper et al. 2020). For example, a national survey conducted by the

American Association on Health and Disability among people with disabilities found that social distancing was impossible for 54 percent of those surveyed (Drum et al. 2020).

Given these accounts, evidence that people with disabilities have experienced comparably greater psychological distress in association with pandemic-related stressors is not surprising (Ciciurkaite et al. 2022; Okoro et al. 2021; Pettinicchio et al. 2021). To address whether this association partly derives from greater exposure to discrimination in the context of pandemic-related stressors, it is helpful to consider both the socially marginalized space in which people with disabilities entered the pandemic, and ways the pandemic may have increased discriminatory treatment toward people with disabilities.

Disability-related Discrimination before and during the Pandemic

Extending a general definition of discrimination to the experience of disability, Carli Friedman and Aleksa L. Owen (2017) define ableism as thus: “Ableism, like other “isms” such as racism and sexism, describes discrimination toward a social group, in this case disabled people, but it also describes how certain ideals and attributes are valued or not valued.” They, and others, attribute disadvantages at the structural, institutional, and interpersonal levels to ableism (Brown 2017; Brown and Turner 2010; Friedman and Owen 2017; Nosek et al. 2003). Indeed, structural and institutional disadvantages associated with disability have long been evident across multiple life domains in policies that deprive people with disabilities of their right to live in communities of their choice, attend integrated schools, parent their own children, or even have children (Karon and Knowles 2018; Mauldin and Brown 2021). Disability has also been linked with economic and social disadvantage (Brown 2017; Iezzoni 2011) which, as noted, is associated with differential treatment (Taylor and Turner 2002; Williams et al. 2012).

Public opinion research provides evidence of this differential treatment in documenting common views of persons with disabilities. For example, a U.S. national opinion poll conducted in 2,000 found that 60 percent of those surveyed felt that persons with physical disabilities have little influence in society today, and 65 percent of those surveyed said there is some or a lot of

prejudice and discrimination against persons with physical disabilities (Kaiser Public Opinion Spotlights 2004). More recently, about half (48 percent) of those responding to a national opinion poll about the Americans with Disabilities Act indicated that they oppose workplace accommodations for people with any form of disability (Lake 2016).

It is additionally notable that everyday discrimination has been regularly reported by and associated with variation in psychological distress among people with various impairment conditions giving rise to disability, including chronic physical health conditions, mental illness and substance use-related problems, and intellectual or cognitive impairment (Brown 2017; Gabbidon et al. 2014; Gayman, Brown, and Cui 2011; Namkung and Carr 2020). Given that macro-level stressors have previously been associated with greater discrimination toward certain socially marginalized groups, it seems highly plausible that people with disabilities have also experienced more discrimination and, thus, greater psychological distress as the pandemic has introduced new stressors into our daily lives.

In much the same way that the events of 9/11 and the Great Recession increased discriminatory treatment toward many race/ethnic minorities and economically marginalized groups (Brown et al. 2019; Burgard and Kalousova 2015; Shah 2019; Whealin et al. 2021), respectively, we anticipated that pandemic-related stressors would similarly increase discrimination toward people with disabilities because disability has been such a defining feature of the pandemic. This possibility is supported anecdotally in the discriminatory framing of disability as problematic or burdensome in discussions of various mitigation policies and restrictions, such as business and school closures, stay-at-home or shelter-in-place orders, limited social gatherings, and travel restrictions (Armitage and Nellums 2020; Ciciurkaite et al. 2022). What we suggest is that those experiencing the greatest strain, for example, at work have also been those most likely to be exposed to colleagues' hurtful or prejudicial comments blaming people with disabilities for the need for safety precautions or regarding them as expendable in the need to "get back to normal" (Lund and Ayers 2020). That is, exposure to unwanted attention, scrutiny, and other types of everyday discrimination may have increased systematically and across multiple life domains that have been challenged

by the pandemic. This could take the form of less courteous or respectful treatment associated with financial difficulties or personal relationship problems exacerbated by the pandemic; social restrictions and policies leading to harassment or micro-aggressions targeting people with disabilities, and so on. The broader point is that people with disabilities have been disproportionately burdened by pandemic-related stressors (Ciciurkaite et al. 2022; Landes et al. 2020; Okoro et al. 2021), and part of this burden has plausibly stemmed from forms of discrimination they may have been more likely to experience.

In the extent to which this has occurred, we can anticipate not only basic associations of pandemic-related stressors and discrimination with psychological distress (Hypothesis 1) but also an elaborated framework of pandemic precarity for people with disabilities as illustrated in Figure 1. This framework predicts that greater discrimination in the context of greater pandemic-related stressor exposure partly accounts for the pandemic-related stressor—psychological distress association among people with disabilities compared to those without disabilities (Hypothesis 2).

DATA AND METHOD

To test these hypotheses, we drew on data from a large community survey designed to examine health outcomes among individuals with and without self-reported disabilities in the context of the COVID-19 pandemic in the Intermountain West. The study was approved by X University's Institutional Review Board. Respondent selection, recruitment, and data collection was conducted by Qualtrics, an Internet-based survey research company that uses paid panels of respondents. The survey included an informed consent statement, and all participants were recruited on a voluntary basis.

To qualify for the survey, respondents had to be 18 years of age and currently residing in the Intermountain West (Colorado, Utah, Idaho, or Wyoming). In addition, a quota sampling technique was used to recruit two subsamples roughly equivalent in size of individuals with and without disabilities. The disability screening question asked individuals,

Do you presently have, or have you ever have been diagnosed with any of the

following health conditions?: autism; developmental disability; psychiatric or emotional disability; intellectual disability; learning disability; speech/language disability; hard of hearing; blindness or low vision; physical disability requiring a mobility assistive device; chronic/long term illness; or traumatic brain injury.

Individuals who agreed to participate in the study completed an online survey that confirmed the presence of a disabling health condition. It should also be noted that the disability screening question allowed respondents to report more than one disabling or chronic health condition. Of the respondents with multiple disabilities, co-occurring psychological and intellectual disabilities were most common (38 percent), followed by psychological and physical disabilities (24 percent), and physical and developmental disabilities (18 percent); approximately 20 percent of the subsample reported all three forms of disability.

All data collection took place in July 2020. The complete study sample included 2,043 individuals, about half of whom ($n = 1,020$) reported experiencing a disability or disabilities.

Measures

Summary statistics for all study variables are presented in Table 1. The main outcome variable assessed in this study was a continuous measure of psychological distress. The main predictor variables, in addition to disability status as described above, were pandemic-related stressors and discrimination. Models also controlled for age, gender, race/ethnicity, education, and household income.

Psychological distress was assessed using the Patient Health Questionnaire (PHQ-9), a nine-item screening instrument that asked questions about the frequency of symptoms of depression over the past two weeks. Response categories for each question in the instrument ranged from 0 (*not at all*) to 3 (*nearly every day*). The total score was based on the sum of these items, ranging from 0 to 27 (Cronbach's $\alpha = .86$).

Pandemic-related stressor exposure was assessed with a count measure that was developed in three steps following an iterative process to ensure data saturation (Boateng et al. 2018). Items

were first identified through an extensive review of research on macro-level stressor exposure and emerging work on stressors associated with the pandemic. Next, content experts who have published articles in peer-reviewed journals on the development of macro-level stress inventories in the disciplines of psychiatry/addiction medicine, psychology, and sociology were consulted on the preliminary list of items. To further ensure that all aspects of pandemic-related stressor exposure were included, an open-ended question in the survey instrument enabled respondents to identify additional stressors they had experienced during the pandemic. This approach was intended to approximate an evaluation of the questions by the target population. No new items were identified through the open-ended question.

These activities yielded a 20-item measure of pandemic-related stressor exposure in the domains of employment, household management, personal relationships, and social life. All of the items included in this inventory are listed in Table 2. As is common practice, the total pandemic-related stressor score was calculated by adding the reported count of stressors (Richman et al. 2012). The total stressor score ranged from zero to 20 ($\alpha = .91$).

Discrimination was measured by the Everyday Discrimination Scale (10 items), which considers recent experiences of relatively minor and more routine experiences of discrimination (Williams et al. 2012; Williams et al. 1997). This scale was created to understand experiences of racial discrimination and is now widely used to understand variation in discrimination associated with other statuses. The measure asks respondents to indicate how often, in their everyday life, they are (1) called names or insulted; (2) threatened or harassed; that, compared to other people, they (3) are treated with less courtesy; (4) are treated with less respect; and (5) receive poorer service at restaurants or stores; and that people act as if (6) they are afraid of you; (7) they think they are better than you are; (8) they think you are not smart; (9) they think you are dishonest; and (10) you are followed around in stores. Each item was scored on a scale from 0 (*never*) to 5 (*almost every day*), and the summative measure ranged between zero and 50 (Cronbach's $\alpha = .94$).

Age. Age of respondent was measured as a continuous variable ranging from 18 to 80.

Table 1. Summary of Study Variables by Disability Status ($N = 2,043$).

Variables	People with disabilities ($n = 1,020$)	People without disabilities ($n = 1,023$)
Outcome and main predictor variables:		
Psychological distress, range 0–27	20.22*** (7.16)	15.39 (6.53)
Pandemic-related stressor exposure, range 0–20	7.14*** (5.40)	4.93 (4.94)
Discrimination, range 0–50	16.96*** (12.39)	8.12 (11.81)
Sociodemographic characteristics		
Age, range 18–80	37.86*** (15.61)	41.84 (16.23)
Gender		
Male	0.26	0.27
Female	0.72	0.72
Non-binary	0.02	0.01
Race/ethnicity		
Non-Hispanic white	0.78	0.77
Black	0.03	0.04
Hispanic	0.09	0.09
Asian	0.02	0.03
Other	0.08	0.07
Education		
High school or less	0.26	0.25
Some college	0.42***	0.31
College or higher	0.32***	0.44
Household income		
Less than \$25,000	0.33***	0.21
\$25,000–\$64,999	0.37	0.35
\$65,000 or more	0.30***	0.44

Note. Mean values (standard deviations) are presented for continuous measures; proportions are presented for categorical measures. Significantly different than people without disabilities.

** $p < .01$. *** $p < .001$.

Gender. Gender was measured as a categorical variable, with the response categories of male (reference category), female, and non-binary/other.

Race/ethnicity. The distribution of the original race/ethnicity measure, including non-Hispanic whites, blacks, Hispanics, Asians, and respondents of another race/ethnic background, is presented in Table 1. This measure was recoded into a binary variable due to small cell issues and compares non-Hispanic whites (reference category) to non-white respondents.

Education. Each respondent's highest educational achievement was measured as a categorical variable with three categories: high school or less (reference category), some college, and college or more.

Household income. Household income was measured as a categorical variable with three categories: less than \$25,000 (reference category), \$25,000 to \$64,999, and more than \$65,000. To adjust for respondents who had missing household income data ($n = 100$), full information maximum likelihood (FIML) estimation was used in the analysis elaborated on below.

Data Analysis

Descriptive statistics and bivariate correlations first provided information on the distribution and basic patterns of correlation among key study variables. Structural equation modeling (SEM) with FIML was then used to evaluate a moderated mediation model in which the mediated effect of pandemic-related stressors on psychological distress through discrimination exposure was

Table 2. Occurrence of Pandemic-related Stressors by Disability Status ($N = 2,043$).

Stressors	People with disabilities ($n = 1,020$)	People without disabilities ($n = 1,023$)
Employment		
Furlough days	27.16%***	20.23%
Salary/pay cut, hours cut, or job demotion	44.31%***	36.17%
Lack of raises or bonuses	50.69%***	39.69%
Not knowing if your employment situation will continue	50.01%***	38.71%
Increased job responsibilities linked with cuts	33.63%***	24.54%
Loss of job/unemployment	30.39%***	22.48%
Problems with your own business/self-employment	20.39%***	15.93%
Having to work because of the risk of losing your job permanently	34.12%***	21.51%
Having to work despite being afraid of getting sick at work	38.53%***	25.22%
Household management		
Problems paying rent or mortgage	38.24%***	22.68%
Problems paying gas, electricity, or heat	34.41%***	20.33%
Delays/difficulties when applying for government financial assistance programs	33.63%***	19.75%
Inadequate amount of food consumption due to lack of financial resources	32.25%***	16.23%
Inadequate amount of food consumption due to restricted access to regular food sources	32.55%***	17.50%
Having to work while in poor health since family depends on your salary	27.55%***	13.20*
Personal relationships		
Ended marital/significant other relationship due to quarantine or shelter-in-place orders	9.22%*	7.33%
Stayed in an unwanted relationship due to quarantine or shelter-in-place orders	13.24%***	8.11%
Social life		
Increased social isolation due to quarantine or shelter-in-place orders	73.53%***	58.06%
Decreased ability to maintain same lifestyle due to financial constraints	51.18%***	34.12%
Decreased work/life balance due to work and home schooling responsibilities	42.25%***	32.06%

Note. Significantly different than people without disabilities based on chi-square tests.

* $p < .05$. ** $p < .01$. *** $p < .001$.

conditional based on disability status (Hayes 2013), net of the sociodemographic control variables (age, gender, race/ethnicity, education, and household income). To compute conditional indirect effects by disability status, we used bootstrapping with 1,000 replications to obtain standard errors and confidence intervals (Hayes 2013; Preacher, Rucker, and Hayes 2007).

The comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) were used to evaluate model fit. Based on current best practices (Byrne 2013), values close to .90 for the CFI, less than .08 for the RMSEA, and less

than .10 for the SRMR were used to assess the fit of the model to the data. There is adequate evidence of fit for the model presented (CFI = .931; RMSEA = .073; SRMR = .031), in which psychological distress is included as a latent construct and all other variables are included as observed. All statistical analyses were performed in Stata, version 17.

RESULTS

Descriptive Statistics

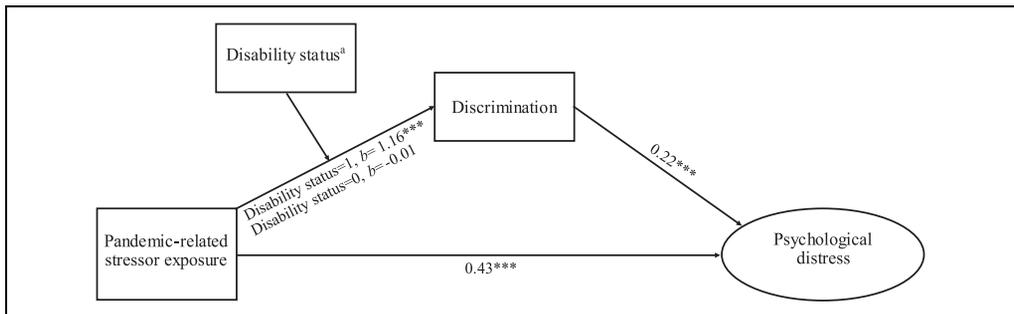
Variation by disability status in the distribution of the study variables is presented in Table 1. On

Table 3. Correlation Matrix of Psychological Distress, Pandemic-related Stressors, Discrimination, and Disability ($N = 2,043$).

Variables	1	2	3	4
1. Psychological distress	1.000			
2. Pandemic-related stressor exposure	.512***	1.000		
3. Discrimination	.538***	.505***	1.000	
4. Disability	.332***	.308***	.296***	1.000

Note. Spearman correlation coefficients are presented for assessing variation by disability status; for all other variables, Pearson correlation coefficients are reported.

*** $p < .001$.

**Figure 2.** Conditional mediation model relating pandemic-related stressor exposure to discrimination and psychological distress, with moderating effect of disability ($N = 2,043$).

Note. Model controls for age, gender, race/ethnicity, education, and household income.

^a1 = has a disability or disabilities, 0 = does not have a disability.

*** $p < .001$.

average, people with disabilities reported significantly greater psychological distress relative to people who were not disabled at the time of this study. People with disabilities also reported significantly higher levels of pandemic-related stressor exposure and discrimination compared to people without disabilities. With respect to sociodemographic characteristics, people with disabilities were somewhat younger, on average, had a lower household income, and were more likely to have attended but not graduated from college than people without disabilities.

Table 3 presents the intercorrelations of major study variables. It is noteworthy that pandemic-related stressors and discrimination were each associated with psychological distress. That is, greater exposure to stressors in the COVID-19 context and greater discrimination were associated with greater symptoms of depression. The results also demonstrated variation as a function of disability status consistent with the associations

reported in Table 1. Compared to the aggregate, having a disability was associated with significantly greater psychological distress exposure to pandemic-related stressors, and discrimination.

The hypothesized associations between pandemic-related stressor exposure, discrimination, disability, and psychological distress are further elaborated on in the moderated mediation analysis presented in Figure 2, which reports standardized coefficients from SEM. In Figure 2, solid lines indicate effects that were statistically significant. This model demonstrated that both pandemic-related stressor exposure ($b = 0.44$, $p < .001$) and discrimination ($b = 0.22$, $p < .001$) had significant direct effects in the prediction of psychological distress, consistent with Hypothesis 1.

A significant indirect pathway from pandemic-related stressor exposure via discrimination exposure was also observed. Moderation tests assessed whether this effect was conditional based on disability status, as depicted in Figure 2. Supporting

Hypothesis 2, a conditional indirect effect by disability status was observed based on variation in the path from pandemic-related stressor exposure to discrimination. The indirect effect was significant only among those with disability (disability status = 1: $b = 1.16$, $p < .001$, standard error = 0.29). Evidence that discrimination mediated the association between pandemic-related stressor exposure and psychological distress was not observed among respondents who did not have disability (disability status = 0: $b = -0.01$, n.s., standard error = 0.29).

DISCUSSION

The COVID-19 pandemic has become a mass disabling event resulting in millions of people adjusting to new and long-term impairment conditions, but it has also disproportionately affected people with disabilities in terms of high infection, hospitalization, and death rates, as well as substantial social and economic disadvantages (Ciciurkaite et al. 2022; Landes et al. 2020; Maroto et al. 2021; O'Connell et al. 2020). Within this context, the aim of this study was to examine the extent to which pandemic-related stressor exposure has also put individuals with disabilities at greater risk of experiencing discrimination, and thereby further undermined their psychological well-being compared to people without disability.

Using data from a community survey with a sizeable subsample of people with physical, intellectual, and psychological disabilities in the Intermountain West, we first assessed whether stressors associated with the COVID-19 pandemic and discrimination are linked with psychological distress (Hypothesis 1). Supporting the first study hypothesis, and consistent with other research on the mental health costs of the pandemic (Ciciurkaite et al. 2022; Landes et al. 2020; Okoro et al. 2021) and minority stress (Meyer and Frost 2013; Montazer 2020), we found that greater exposure to both pandemic-related stressors and discrimination were associated with greater symptoms of depression. Although the observed association between pandemic-related stressors and psychological distress is consistent with other research, it notably extends work comparing rates of distress or disorder before and during the pandemic (Pfefferbaum and North 2020; Rajkumar 2020; Usher et al. 2020) by explicitly modeling the effects of pandemic-related stressors across

four life domains. This approach recognizes strains uniquely associated with macro-level social forces adding to individuals' existing stress burdens and, thus, additionally impacting their health and well-being (Brown et al. 2019; Richman et al. 2012).

We further suggested that within the context of the pandemic, people with disabilities have had to contend with more unwanted attention and discriminatory treatment. As such, we hypothesized that the significance of discrimination exposure for the association between pandemic-related stressors and psychological distress would be conditional based on disability status (Hypothesis 2). Supporting this view, we found that the mediated effect of pandemic-related stressors on psychological distress through discrimination exposure was significant among people with disabilities but not among people without disabilities.

This finding highlights the salience of disability for discriminatory experiences during the pandemic, and is consistent with a general minority stress proliferation model in which macro-level stressors impact mental health partly because they increase exposure to minority stressors. Extending this consideration, we are mindful that other research on stress proliferation among minoritized groups indicates that minority stressors further impact the performance of valued social roles (e.g., LeBlanc et al. 2015). Consideration of the social roles most impacted by disability-based discrimination during the pandemic may similarly be useful in identifying additional stressors deriving from social marginalization. For example, we previously speculated about a link between greater workplace challenges associated with the pandemic and greater discrimination, and in such cases might also anticipate additional strains such as greater work–family conflict. As well, minority stress theory distinguishes distal stressors such as the experience of discriminatory events and proximal stressors such as concealment or expectations of rejection (Meyer 2003). Investigating whether greater discrimination in the context of the pandemic has also increased feelings of stigmatization or social devaluation may provide additional clarity on the psychological impact of the pandemic for people with disabilities.

More fundamentally, this set of findings also raises questions concerning what it is about disability that has elicited greater discrimination during the pandemic. Although research on the

impact of the pandemic on discrimination is only emerging, this work offers several promising directions for further study, including fear of contagion and the inability to keep health information private as potential drivers of discriminatory treatment (Fan, Qian, and Jin 2021). As well, there is some concern that the pandemic has made preexisting bias toward disabled bodies more acceptable in medical settings. For example, there is apprehension about people with disabilities being “triaged” in cases where there is insufficient equipment in hospitals to treat patients in critical condition (Chen and McNamara 2020), while many hospitals have also released guidelines directing the allocation of critical care resources to “patients most likely to benefit” and “compassionate extubation” for patients with “prior advanced health problems” after seven days (Eisenberg and Goldenberg 2020). Because individuals with disabilities live with co-morbid health conditions at higher proportions relative to their non-disabled counterparts, these practices disadvantage them disproportionately (Akerkar 2020).

At the same time, public discourse concerning people with disabilities during the COVID-19 pandemic provides numerous examples of the devaluation of disabled lives (Akerkar 2020; Armitage and Nellums 2020). The language of “pre-existing or underlying” health conditions in popular discourse, for example, has been used to stereotype people with disabilities and to normalize a language that implies that disabled lives are less valuable (Akerkar 2020). Relatedly, Xiaoling Xiang and colleagues (2021) found through their analysis of discussions on the social media platform Twitter that jokes or ridicule and personal opinions were frequently shared describing the lives of people with disabilities as a necessary trade-off for ending quarantine or avoiding negative mental health effects associated with quarantine.

These examples recognize that discriminatory practices and treatment toward people with disabilities during the pandemic have not only happened at the interpersonal level. This consideration is crucial to an understanding of ableism as more than the individual experience of prejudice, discrimination, or stigmatization among people with disabilities based on a minority stress framework (Meyer and Frost 2013; Williams et al. 2012). Although interpersonal experiences are impactful, they are reinforced by institutional practices, social policies, and cultural

norms—that is, they are perpetuated through an integrated and dynamic system. This systemic understanding of ableism provides clearer context for why we would anticipate greater discrimination toward people with disabilities during the pandemic compared to explanations rooted in interpersonal or group dynamics. However, we were not able to directly test this systemic view, because structural ableism is not clearly conceptualized and remains largely unmeasured. Given this important limitation, the development of measures that could directly address structural dimensions of ableism is a critical task for future research. Research on structural racism offers several possible approaches, such as incorporating data on U.S. state-level variation in employment, income, and political participation of blacks relative to whites (Groos et al. 2018), which could be usefully modified to assess variation by disability status.

Along with addressing structural ableism, the inclusion of contextual measures could also identify policies and practices in response to the COVID-19 pandemic that have exacerbated or reduced vulnerabilities associated with disability. For example, when data were collected for this study in the Intermountain West region of the United States, there were no shelter-in-place orders in Utah or Wyoming, face masks were not required in public spaces or for employees of public-facing businesses in Idaho, and Medicaid qualifications had not expanded in Wyoming (Raifman et al. 2020). Such variation in state-level policy may further contribute to variation by disability status in the relevance of different pandemic-related stressors and their mental health impact. Supporting this possibility, Rachel Donnelly and Mateo P. Farina (2021) found that the mental health effects of household income shocks associated with the pandemic were reduced for individuals living in states with more supportive social policies related to utilities coverage, unemployment insurance, and Medicaid coverage. Few studies, however, have used state-level or other contextual data resources to assess variation associated with disability.

Although the findings of this study support the need for more thorough investigations of ableism in the context of the pandemic, we are also mindful that other scholarship highlights a need for attention to additional status characteristics. In particular, research has demonstrated that Asian populations have been heavily targeted by discrimination associated with the COVID-19

pandemic and suffered psychologically as a result (Fan et al. 2021; Lee and Waters 2021). In recognizing the multiple dimensions of marginalization the pandemic has laid bare, we encourage future research to address how intersecting forms of oppression shape individual experiences. Indeed, research suggests that certain constellations of demographic and health characteristics may put individuals with disabilities at an increased risk for discrimination. For example, being female, older, a racial or ethnic minority, and having a behavioral disability are associated with an increased risk of harassment in the workplace (Shaw, Chan, and McMahon 2012). Understanding the salience of multiple social statuses for pandemic-related stressors and discrimination—in and across different geographical contexts—could help guide intervention efforts to address the pandemic’s significant mental health effects.

Several study limitations provide additional direction for future research. First, due to the cross-sectional nature of this data, we were not able to assess causality in the associations between pandemic-related stressor exposure, discrimination, and psychological distress. We encourage the collection of longitudinal data to examine causality and the potential for bi-directional associations among the factors considered more clearly. Adding new waves to existing surveys might also help contextualize the effects of the COVID-19 pandemic in association with previous macro-level stressors. This is a central component of the macro-level stress proliferation framework we are unable to test with this data. For example, the Great Recession ushered in a period of cumulative adversity and hardship for many people, which may have impacted how different groups have experienced the pandemic. Additionally, all data were collected in the Intermountain West region as required by the funding source and, as such, our results are not generalizable to other parts of the United States. Within this sampling frame, individuals with severe visual and cognitive disabilities as well as individuals without access to the Internet were also excluded from study participation. Additionally, the study sample was not based on probability sampling, which may lead to issues of under-coverage of the target population and self-selection bias (Bethlehem 2010; Keyes and Westreich 2019). It is reasonable to expect that those who had Internet access and agreed to participate in the study may systematically differ from those who did not. While the

lack of representation of hard-to-reach populations, such as individuals with disabilities, in large nationally representative surveys makes quota sampling valuable, a larger and more inclusive sample matched on the demographic characteristics of the population of interest would facilitate a more robust comparison across individuals with and without disabilities in future work in this area.

Despite these limitations, our study builds on previous research by highlighting the importance for people with disabilities of discrimination as one of the drivers of widening mental health disparities associated with the COVID-19 pandemic at the population level. Study findings underscore the need to treat discrimination as a social problem with health consequences in efforts among scholars and policymakers to meaningfully address the effects of macro-level stressors such as the COVID-19 pandemic (Armitage and Nellums 2020; Mauldin and Brown 2021). In further considering the challenges macro-level stressors present for the life experiences and opportunities of people with disabilities and those of other disadvantaged social statuses, we must also confront the enduring forms of marginalization and distress they elicit.

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