



Brief communication

Psychological distress and well-being among sensory impaired individuals during COVID-19 lockdown measures



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ABSTRACT

Purpose: Hearing and vision impairment are prevalent chronic conditions associated with poorer mental health. Limitations of in-person contacts during COVID-19-related lockdown measures may affect those with sensory impairments more severely exacerbating mental health problems. We aimed to determine whether hearing and/or visual impairment were associated with more psychological distress during a time of lockdown measures in Spring/Summer 2020 in Wisconsin.

Methods: We included 1341 (64% women, aged 20–92 years) Survey of the Health of Wisconsin COVID-19 survey participants (May 2020–July, 2020). We assessed self-reported current mental health and well-being and vision and hearing impairment. Logistic regression models with sensory impairments as determinants and mental health outcomes were adjusted for age, gender, race, education, heart disease, hypertension, hyperlipidemia, and diabetes.

Results: Vision impairment was associated with increased odds of generalized anxiety disorder (odds ratio = 2.10; 95% confidence interval = 1.32–3.29) and depressive symptoms (2.57; 1.58–4.11), greater likelihood to report loneliness (1.65; 1.00–2.64) and hopelessness (1.45; 1.01–2.08). Hearing impaired individuals reported more loneliness (1.80; 1.05–2.98) and hopelessness (1.42; 0.99–2.03). Exploratory analyses revealed that sensory impaired individuals less often chose walking as a coping strategy during the pandemic.

Conclusions: Individuals with sensory impairment may represent a particularly vulnerable population during the COVID-19 pandemic. Future research should determine underlying reasons and interventions to mitigate this population's disadvantages.

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Introduction

The SARS-COV-2 pandemic has severely impacted global population health. In addition to its direct impact on health, it has affected nearly all areas of daily living. Lockdown and social distancing measures have been utilized to mitigate disease spread.

Previous studies have found increased psychological distress, depression, and loneliness during lockdown phases, and people reported negative impacts on their social lives [1–3]. Lockdown measures may affect individuals with disabilities more than others, but few studies have evaluated their impacts on persons with disabilities including vision and hearing impairment and whether there are differences in coping strategy usage. Hearing impairment and vision impairment are highly prevalent chronic conditions that affect peoples' daily lives and have been associated with poorer mental health and well-being [4]. Individuals with sensory impairments report reduced social support and participation and more loneliness [5,6]. Limitations of in-person contacts may impact in-

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dividuals with sensory impairments more severely, exacerbating mental health problems and reduced well-being. For instance, virtual social interactions, which have often been adopted to substitute in-person interactions, may be more difficult for people with a vision and/or hearing impairment making them more affected by reductions in real-life interactions [7]. Moreover, communication may be hampered for persons with hearing impairment due to masking and physical distancing [7]. Consistently, a recent survey of patients with vision impairment found that those with vision impairment reported more concerns about social interactions during the COVID-19 pandemic compared to individuals without disabilities [8]. However, existing research on mental health, psychological distress, and well-being of individuals with vision and/or hearing impairment during the COVID-19 pandemic is very limited and based on smaller samples of patients and older adults [8,9].

Thus, we aimed to determine whether self-reported hearing and/or vision impairment were associated with psychological distress and well-being in early Spring/Summer of 2020 in Wisconsin. In exploratory analyses, we also investigated coping strategy usage among persons with and without a sensory impairment.

Methods

Study sample

This study is based on Survey of the Health of Wisconsin (SHOW) data. SHOW is an ongoing survey of Wisconsin residents, which was established in 2008 [10]. In brief, each year a representative sample of Wisconsin residents was selected from households using two-stage probability-based cluster sampling. The study was approved by the University of Wisconsin-Madison Health Sciences Institutional Review Board with written informed consent (protocol number:2013–0251). In Wisconsin, the COVID-19 Safer-at-home lockdown was initiated March 25, 2020 with incremental reopening starting in May. SHOW launched a COVID-19 community impact survey May 18–July 5 [11]. All past adult SHOW participants who consented to future contact were invited to the online survey. Out of 5510 eligible participants, 1403 completed the survey. Survey respondents and nonrespondents did not significantly differ by age. Respondents were more likely to be non-Hispanic White and female, and had higher education [11]. In this study, we included COVID-19 survey participants with complete data on self-rated hearing and vision, age, gender, race, and education (N = 1341).

Measures

Hearing and vision

We asked participants to rate their vision (with glasses, if used) and their hearing (with hearing aid, if used) on a scale of excellent, very good, good, fair, and poor [12,13] and quantified participants as having a hearing and/or vision impairment, respectively, if they reported fair or poor function.

Psychological distress and well-being

We screened for anxiety disorder symptoms within the past 2 weeks, using the Generalized Anxiety Disorder [GAD]–2 scale. A GAD-score ≥ 3 was considered as having symptoms of an anxiety disorder [14]. We determined participants' depressive status within the past 2 weeks using the Patient Health Questionnaire [PHQ]–2 screener. A PHQ-score ≥ 3 was defined as having depressive symptoms [15]. We asked participants if they had sought professional mental health help (such as a psychiatrist, psychologist, psychiatric nurse, or a social worker) since COVID-19 began.

Moreover, loneliness and hopelessness in the past week were evaluated using two 4-point Likert scale items from the Center

for Epidemiologic Studies Depression Scale (CES-D). Those who reported feeling lonely (moderately [3–4 days], or most days [5–7 days]) were categorized as feeling lonely and those reporting feeling hopeful some days (1–2 days) or rarely (≤ 1 day) were categorized as feeling hopeless [16].

We also asked participants if they had started any coping strategies since the pandemic began (Supplementary Material 1).

Other variables

Age, gender, race, education, and history of chronic health conditions were assessed (see Supplementary Material 2 for more details). We also asked for a history of anxiety disorders and/or depression.

Statistical analyses

Data were analyzed using R (R Core Team, 2021) version 4.1.1. We used logistic regression models with vision impairment or hearing impairment as determinant and with the different distress and well-being outcomes. All models were adjusted for previous risk factors of sensory impairment and psychological distress and well-being, including age, gender, race, education, history of heart disease, hypertension, hyperlipidemia, and diabetes. We tested all models for gender x sensory impairment interactions. Moreover, we repeated all models, excluding individuals with a history of anxiety or depression (N = 337).

In exploratory analyses, we assessed whether people with a sensory impairment were more or less likely than those without sensory impairment to choose certain coping strategies since COVID-19 began. Among 16 coping strategy options (multiple select), we investigated differences in the five most commonly reported strategies (Supplementary Material 3: watching television, taking walks outside, gardening or working on home improvement projects, watching online movies or shows, and having a video call with friends or family). We used logistic regression models with vision impairment and hearing impairment as determinants and the five coping strategies as outcomes, adjusting for age, gender, race, and education.

Results

Study sample

We included 1341 participants (64% women, aged 20–92 years, 87% non-Hispanic White), of which N = 141 reported a vision impairment and N = 144 reported a hearing impairment (Table 1). We did not have enough cases to support the study of dual sensory impairment (N = 52). Our analytic sample (N = 1341) was not substantially different in any demographics from the total SHOW COVID-19 survey sample (N = 1403; Supplementary Material 4). There were no differences in the prevalence rates of our psychological distress and well-being outcomes between individuals who completed the survey earlier or later during the course of the study (Supplementary Material 5).

We found that individuals with a vision impairment were more likely to have symptoms of a generalized anxiety disorder or depression in the past 2 weeks than people without a vision impairment. There was no difference in seeking professional help. Compared to people without vision impairment, individuals with a vision impairment reported being more lonely and hopeless in the past week (Table 2). People with hearing impairment were not more likely to have symptoms of an anxiety disorder or depression or to seek professional help. People with hearing impairment reported being more lonely and hopeless in the past week, while the association with hopelessness remained only on a trend level in the fully-adjusted model (Table 2).

Table 1

Characteristics of the analytic sample of the COVID-19 community impact survey May 18, 2020–July 5 2020, from the survey of the Health in Wisconsin (n = 1341).

Characteristic, N(%)	All 1341	Vision impairment 141(10.5)	Hearing impairment 144(10.7)
Age			
18–45 y	377(28.1)	33(23.4)	25(17.4)
46–55 y	221(16.5)	32(22.7)	26(18.1)
56–65 y	328(24.5)	35(24.8)	23(16.0)
66+ y	415(31.0)	41(29.1)	70(48.6)
Women	853(63.6)	93(66.0)	67(46.5)
Non-Hispanic white*	1173(87.5)	108(76.6)	127(88.2)
Bachelor's degree and above†	686(51.2)	49(34.8)	59(41.0)
Heart disease	96(7.2)	12(8.5)	23(16.0)
Hypertension	384(28.6)	51(36.2)	58(40.3)
Hyperlipidemia	322(24.0)	41(29.1)	44(30.6)
Diabetes	132(9.8)	21(14.9)	17(11.8)
History of anxiety or depression	337(25.1)	47(33.3)	42(29.2)
Current anxiety symptoms	197(14.7)	34(24.6)	20(14.0)
Current depressive symptoms	136(10.1)	31(22.1)	16(11.1)
Professional mental health help during pandemic	76(5.7)	13(9.2)	10(6.9)
Lonely	159(11.9)	27(19.1)	22(15.4)
Hopeless	560(41.8)	72(51.1)	71(49.3)

Note: Sample sizes differ slightly due to missing data (<1% missingness in any variable).

* Non-Hispanic White was compared to all other ethnic and racial groups (African American and non-Hispanic; Hispanic; Other non-Hispanic).

† Bachelor's degree and above was compared to 'Less than a bachelor's degree' for the level of education.

Table 2

Association of vision and hearing impairments with measures of psychological distress and well-being, OR (95% CI).

	Vision impairment	Hearing impairment
Anxiety symptoms	2.10 (1.32,3.29)	1.20 (0.69,2.01)
Depressive symptoms	2.57 (1.58,4.11)	1.27 (0.69,2.23)
Professional mental health help during pandemic	1.64 (0.81,3.11)	1.89 (0.87,3.76)
Lonely	1.65 (1.00,2.64)	1.80 (1.05,2.98)
Hopeless	1.45 (1.01,2.08)	1.42 (0.99,2.03)

CI = confidence interval; OR = odds ratio.

Results of logistic regression models adjusted for age, gender, education, race and history of chronic conditions heart disease, hypertension, hyperlipidemia, and diabetes in COVID-19 community impact survey sample (May 18, 2020–July 5 2020,) from the Survey of the Health in Wisconsin.

Table 3

Sensitivity analysis: association of vision and hearing impairments with measures of psychological distress and well-being in individuals without a history of depression or anxiety disorder, OR (95% CI).

	Vision impairment	Hearing impairment
Anxiety symptoms	1.80 (0.91,3.36)	1.20 (0.53,2.43)
Depressive symptoms	2.29 (1.06,4.63)	0.68 (0.20,1.76)
Professional mental health help during pandemic	1.67 (0.37,5.32)	1.19 (0.18,4.45)
Lonely	2.09 (1.01,4.04)	2.09 (0.98,4.16)
Hopeless	1.39 (0.90,2.15)	1.49 (0.97,2.27)

CI = confidence interval; OR = odds ratio.

Results of logistic regression models adjusted for age, gender, education, race and history of chronic conditions heart disease, hypertension, hyperlipidemia, and diabetes in individuals without a history of anxiety disorders and/or depression from the COVID-19 community impact survey (May 18, 2020–July 5, 2020,) from the Survey of the Health in Wisconsin.

Results were similar between men and women. We found only one significant gender interaction effect: The association of hearing loss with loneliness was only significant in women (odds ratio, OR = 2.52, 95% confidence interval, CI 1.37,4.50) not in men (OR = 0.74, 95% CI 0.17,2.31).

When excluding individuals with a history of anxiety disorder or depression (N = 337, Table 3), the effect sizes were similar with the exception of vision models on anxiety, where the effect size substantially decreased (OR = 1.80; 95% CI 0.91,3.36).

In our exploratory analyses of coping strategies, adjusted for age, gender, race, and education we found that people with vision or hearing impairment were less likely to use walking as a coping strategy than individuals without disabilities (OR = 0.58; 95% CI 0.40,0.85; and OR = 0.65; 95% CI 0.45,0.95).

Discussion

We found that individuals with self-reported sensory impairments experienced more psychological distress and worse well-being during the SARS-COV-2 pandemic in early Spring/Summer of 2020, a time when pandemic lockdown measures were implemented in this study population. Individuals with sensory impairments were more affected on measures of depression, anxiety, hopelessness (vision only), and loneliness (vision and hearing), compared to individuals without a sensory impairment, identifying them as a particularly vulnerable population during the pandemic. Moreover, exploratory analyses indicated that individuals with a hearing or vision impairment were less likely to choose walking as a coping strategy. This extends limited research on mental health

and well-being of individuals with sensory impairments during the COVID-19 pandemic [8,9] to population research covering the whole adult lifespan.

Specifically, we found that individuals with vision impairment were more likely to report anxiety and depressive symptoms in the past 2 weeks. People with vision impairment also reported being more lonely (women only) and hopeless in the past week. This is consistent with previous clinical research, in which patients with vision impairments expressed more anxiety and concern about their health [8]. One previous survey in 80 older participants found self-reported hearing difficulties being associated with greater levels of loneliness and depression during the pandemic [9]. We did not find that individuals with a hearing impairment had elevated anxiety or depression, but they reported being more lonely and hopeless in the past week. One possible explanation for the observed disparities in individuals with sensory impairments may be constraints in social interactions. Compared to individuals without disabilities, persons with a sensory impairment have reduced social networks [5,6]. Additional lockdown measures may exaggerate social disconnectedness and aggravate mental health issues. A comfort with and access to technology is thought to be important for coping with restrictions and maintaining social connections during the lockdown [17]. Persons with sensory impairments might be limited in using virtual communication tools [7] and might, thus, suffer more from lacking real-life social interactions. In addition, masking and physical distancing may hamper communication particularly for people with a hearing impairment [7].

Our results suggest that individuals with sensory impairments may be less likely to use walking as a coping strategy. Walking was among the primary coping strategies identified in our study and recent research has also indicated a significant increase in outdoor physical activity behavior during Stay-at-Home orders [18]. Individuals with hearing and/or vision impairments have shown decreased mobility in previous research [19,20]. Thus, this may reflect a particular disadvantage of this population.

Future studies should investigate underlying reasons for the discrepancies found in this study, such as potential social network or maladaptive leisure activity changes in people with sensory impairments. This could inform about methods to mitigate this population's disadvantages and to generate specific and individualized coping strategies for individuals with a sensory impairment.

Limitations

Due to the cross-sectional dataset, we cannot determine temporality of effects with certainty. While we asked for current psychological distress and well-being statuses during COVID-19 lockdown phases, some participants' mental health problems may have predated the pandemic. However, our results did not substantially change when excluding individuals with a history of anxiety disorders and/or depression. We relied on distress screening tools instead of longer questionnaires but were able to include multiple potential confounders in our models. Additionally, future studies with objective assessments of sensory impairments should complement this research. The SHOW COVID-19 survey had a lower response rate and the sample included a higher proportion of women, non-Hispanic Whites, and individuals with higher educational attainment [11]. More research will be needed to determine if results are generalizable to the entire Wisconsin state population.

Conclusion

Individuals with a sensory impairment may be particularly vulnerable to psychological distress during the COVID-19 pandemic.

This could inform future interventions to provide resources and care to people with disabilities. Longitudinal research is needed to determine underlying reasons and interventions to mitigate this population's disadvantages.

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Author note

The datasets and questionnaires for this manuscript are publicly available upon request to data@show.wisc.edu. More information on the data request process can be found online (<https://show.wisc.edu/our-data/accessing-data>).

Author contributions

NM served as the lead for conceptualization, methodology, formal analyses and visualization. AAS, MCW, and KCM were involved in data curation, investigation and project administration and KCM was responsible for funding acquisition and supervision. All authors interpreted the results. NM wrote the original draft and all authors reviewed and edited the draft. All authors provided critical feedback and helped shape the research, analyses, and manuscript.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.annepidem.2023.01.002](https://doi.org/10.1016/j.annepidem.2023.01.002).

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