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# Anxiety and Social Support Are Associated with Loneliness among Adults with Disabilities and Older Adults with No Self-Reported Disabilities 10 Months Post COVID-19 Restrictions

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**Abstract:** With increased physical restrictions during the coronavirus disease 2019 (COVID-19) pandemic, many individuals, especially older adults and individuals with disabilities, experienced increased feelings of loneliness. This study aimed to identify factors associated with loneliness among older adults and people with disabilities residing in British Columbia (BC), Canada 10 months following COVID-19 physical restrictions. Participants included a total of 70 adults consisting of older adults (>65 years of age) without any self-reported disabilities and adults (aged 19 or above) with disabilities (e.g., stroke, spinal cord injury, etc.). Participants completed standardized self-report measures of their levels of anxiety, depression, social support, mobility, and loneliness. We used hierarchical linear regression to determine the association of age, sex, disability status, anxiety, depression, social support, and mobility with loneliness. Participants reported general low levels of loneliness, anxiety, and depression and an overall high level of perceived social support. Most participants reported living with others. Our analysis showed a positive association between anxiety and loneliness ($\beta = 0.340$, $p = 0.011$) and a negative association between social support and loneliness ($\beta = -0.315$, $p = 0.006$). There was no association between depression and loneliness ($\beta = 0.210$, $p = 0.116$) as well as between mobility and loneliness ($\beta = -0.005$, $p = 0.968$). These findings suggest that anxiety and social support have been significantly associated with loneliness in older adults and people with disabilities during the COVID-19 pandemic. Increased efforts to reduce anxiety and improve social support in clinical and community settings may be helpful in reducing loneliness in older adults and people with disabilities during the COVID-19 pandemic.

**Keywords:** loneliness; COVID-19; older adults; disabilities; depression; anxiety; social support; participation; quantitative; regression



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## 1. Introduction

The coronavirus disease 2019 (COVID-19) led to a global pandemic, declared by the World Health Organization (WHO) on 11 March 2020 [1]. To reduce the spread of COVID-19, restrictions were implemented across the world, including physical distancing, the avoidance of social gatherings, adequate hand hygiene, the wearing of masks, and travel restrictions [2]. Globally, these restrictions had a drastic impact on individuals' daily routines and habits, and also led to a reduction in social connections [3,4]. Social connection is a fundamental human need and promotes both physical and psychological well-being [4]. Consequently, the reduction in social connections during the COVID-19 pandemic resulted in negative impacts on mental health and well-being [5]. In particular, people reported higher rates of loneliness due to increased physical restrictions and the

resulting social isolation [6]. In fact, a study investigating online survey data from 101 different countries and with 20,398 respondents found the prevalence of severe loneliness to be 21% during the COVID-19 pandemic, with only 6% reporting feeling severely lonely before the pandemic [7]. Loneliness is an important health risk factor that has been shown to have negative effects on an individual's well-being, similar to obesity and smoking [8]. In fact, lonely individuals have been found to have a 50% higher mortality rate when compared with individuals who do not experience loneliness [8].

Loneliness is described as an individual having a lower quality or quantity of social engagement than desired and is characterized as a subjective experience [9,10]. For instance, an individual with an extensive social network may still experience feelings of loneliness when their desired levels of social engagement is higher than the levels that they are experiencing [9,10]. In fact, the interactionist theory defines loneliness as a response to the presence of a deficiency or dissatisfaction in social relations [11]. Individuals from different cultural backgrounds can also experience loneliness at different levels, leading to the subjectivity of loneliness [12]. Loneliness has a negative impact on the mental health and wellness of individuals and is associated with an increased experience of anxiety and depression [6,9].

Loneliness is experienced at higher rates among older adults and people with disabilities when compared with younger and able-bodied individuals, even pre-pandemic [13,14]. This could be due to the higher likelihood of these populations losing friends and relatives, such as a spouses, as well as having more health-related challenges that may lead to increased feelings of loneliness [15,16]. In addition, older adults and individuals with disabilities have both been found to experience an increase in loneliness during the pandemic when compared with pre-pandemic times [17,18]. For example, a study reported a significant increase in severe loneliness in the older adult population (from 8.8% to 27.7%) after the onset of the COVID-19 pandemic [18]. Another study found a 31% increase in loneliness among people with disabilities during the pandemic [19].

COVID-19 restrictions have been experienced differently across the world. For example, there have been different levels of restriction measures implemented between the provinces of Canada. In British Columbia, where this study was completed, the restrictions involved employees working from home, distant education, restrictions on social gatherings, and the closure of non-essential services [20]. There was also a specific reopening plan within BC which occurred in four phases [20]. The first phase involved the opening of essential services while complying with provincial health orders [20]. During the second phase, non-essential services, such as gyms, salons, and childcare services started reopening [20]. The reopening continued further in the third phase, during which faith-based organizations resumed in-person gatherings of up to 50 people [20]. During the last phase, depending on community-wide vaccinations and immunity, large gathering over 50 were allowed [20].

Investigating the impacts of physical restrictions on loneliness is particularly important within populations of older adults and people with disabilities [21,22]. Older adults and people with disabilities are more likely to contract a more severe case of COVID-19, as they are more likely to have underlying health conditions and be immunocompromised [9,21,23]. As a result, these populations were frequently more diligent at following physical restrictions in order to reduce their risk of contracting the virus [9,21]. Stricter physical restrictions placed older adults and people with disabilities at a higher risk for social isolation and experiencing feelings of loneliness [24]. At the same time, these populations were more likely to see the rapid deterioration of social networks due to the "loss of contemporaries, cognitive decline, disability, and the loss of social roles", and they were more vulnerable to experiencing loneliness even outside the context of the pandemic [25]. Older adults and individuals with disabilities may have been at particular risk for increased depression, anxiety, loneliness, social isolation, and a poor quality of life during the COVID-19 pandemic [24]. With older adults and individuals with disabilities being more vulnerable to experiencing loneliness, it is important to investigate the state of loneliness and factors

associated with it in these individuals during the state of the pandemic. In addition, older adults and people with disabilities often face similar challenges in their daily lives. Some of these challenges include transportation, being isolated from society, and a dependence on others for completing their daily activities [26–29]. Facing these challenges increases the vulnerability of these populations of experiencing loneliness during the COVID-19 pandemic. As such, loneliness in these two populations were investigated together in this study.

Older adults and people with disabilities.

Knowing some of the factors associated with loneliness can allow for a better management of loneliness during a challenging context such as a pandemic. Some studies have found anxiety and depression to lower an individual's ability to sustain social networks, hence causing an increased feeling of loneliness [6,30]. This signifies the importance of satisfactory social support for reducing the experience of loneliness. In addition, being able to move around in one's community has an important role in being able to engage in activities and to maintain ties with friends and families, thereby reducing feelings of loneliness [31]. As a result, the reduction in mobility due to COVID-19 restrictions can possibly lead to an increased experience of loneliness. There is currently a lack of knowledge on whether COVID restrictions impacted the relationship between loneliness and some of its associated factors in vulnerable populations. As a result, this study was completed to determine the relationship between social support, anxiety, depression, and mobility with loneliness during the COVID-19 pandemic among older adults and people with disabilities.

## 2. Methods

### *2.1. Study Design*

Data for this study were collected as part of a larger longitudinal, concurrent, mixed method design study conducted at the University of British Columbia [20]. Informed consent was obtained from all individuals participating in the study [20]. This study was approved to be completed through the UBC Behavioural Research Ethics Board (Approval No. H20-01109) on 17 April 2020 [20].

### *2.2. Participant Recruitment*

Recruitment occurred through three main methods including (1) researcher databases that included information on participants with SCI, stroke, and other disabilities that required them to use mobility devices who consented to being contacted again after participating in previous studies; (2) online postings on community and advocacy websites such as the International Collaboration on Repair Discovery and REACH BC websites; and (3) social media advertisements (e.g., Facebook and Instagram). The recruitment occurred from April to May 2020. Participants recruited were either older adults (>65 years) without self-identified disabilities or individuals aged nineteen or above with self-reported disabilities. In addition, participants were all BC residents and identified as being able to comfortably speak and write in English. Individuals that reported having moderate to severe cognitive impairment or aphasia were excluded. All participants received a CAD 30 honorarium after each interview.

### *2.3. Data Collection*

Data were collected between April 2020 and February 2021 via online surveys (i.e., Qualtrics). Individuals were given a link to access the Qualtrics survey and were asked to complete the survey within 7 days. Information on demographics (e.g., age and sex) along with measures of life-space mobility, depression, anxiety, social support, and loneliness were collected through the surveys. If an individual was unable to complete the survey online, a phone call was arranged to facilitate the completion of the survey. Individuals were asked to answer questions through a self-report survey on items assessing mobility problems, mental health disorders, sensory disabilities, physical disabilities, and learning disabilities.

### *2.4. Measures*

The UCLA Three-Item Loneliness Scale: This scale was used to measure the levels of loneliness among participants. This scale ranges from 3–9, with the values 3–5 and 6–9 illustrating lower or higher levels of loneliness, respectively [32]. This scale has been shown to have a high level of internal consistency and validity with a reported Cronbach $\alpha$ of 0.82 [33]; from the data in our study, we calculated that the Cronbach $\alpha = 0.829$.

The Hospital Anxiety and Depression Scale (HADS): This scale was used for measuring levels of depression and anxiety. The HADS is a self-report assessment measure that contains subscale scores for anxiety (0–21) and depression (0–21) [34]. On this scale, scores $\geq 8$ signify a presence of both depression and anxiety [35]. This scale has been shown to have good agreement with the clinical diagnosis of anxiety and depression, as well as a good internal consistency with a Cronbach $\alpha$ of 0.83 [36] and 0.895 in this study.

The Multidimensional Scale of Perceived Social Support (MSPSS): This scale was used to measure the levels of social support. The MSPSS contains a total score (12–84) with subscales focusing on sources of social support, such as family, friends, and significant others [37]. Values 12–35, 36–60, and 61–84 indicate low, medium, and high levels of perceived social support, respectively [37]. This scale has been shown to have a good internal consistency with a Cronbach $\alpha$ of 0.88 [38] and 0.919 when calculated in this study.

Life-Space Assessment: This scale was used to measure space mobility among participants. It reports on the frequency and distance that people travel "outside the bedroom, outside the house, in the neighbourhood, outside the neighbourhood but in town, and outside town during the previous 4 weeks" [39]. The scale ranges from 0–120, with higher scores indicating more mobility [39]. The 9-day test–retest reliability (intra-class correlation coefficient) has been reported to be high (0.876) in people with spinal cord injuries [40]. This measure was found to have a Cronbach $\alpha$ of 0.841 in this study.

### *2.5. Data Analysis*

Descriptive statistics (means, standard deviations, and proportions) were used to describe the samples and to provide insight into the scales included in the analysis. Data were analyzed using SPSS 25 software. We used linear regression to determine the most relevant factors associated with loneliness. To better distinguish between the roles of demographic and psychosocial factors, we used a hierarchal linear regression approach. The first model included only demographic factors: age, sex, and disability status. The second included demographic factors plus anxiety, depression, social support, and life-space mobility. The collinearity threshold was placed at 0.4 for tolerance and 2.5 for VIF [41]. The level of significance was set at $p \leq 0.05$.

## 3. Results

The participants included 70 adults over the age of 19 residing in British Columbia, Canada. Participants included (1) individuals with disabilities (consisting of people with spinal cord injuries, a stroke history, and other self-reported disabilities), and (2) older adults (>65 years) without self-identified disabilities. The participants' demographic information is provided in Table 1. A little more than half were male, and the majority lived with others.

### *3.1. Depression, Anxiety, Social Support, Life-Space Mobility, and Loneliness*

Overall, participants scored in the lower range of the scales for anxiety, depression, and loneliness (Table 1). More than four out of five participants scored in the lower range of the HADS depression subscale (0–7), and more than three out of five participants scored in the lower range of the HADS anxiety subscale (0–7) (Table 1). The average level of perceived social support was in the higher range of the MSPSS scale for more than three out of five participants (Table 1). Most participants (more than three out of five) reported experiencing low loneliness (Table 1). The average LSM scores were in the lower range of the LSA scale (Table 1).

**Table 1.** Descriptive statistics and the distribution of psychosocial factor scores.

| | **N (%) or Mean ± SD** |
|---|---|
| Gender | |
| Male | 38 (54%) |
| Age | |
| 30–40 | 9 (13%) |
| 40–50 | 6 (8%) |
| 50–60 | 14 (20%) |
| 60–70 | 19 (27%) |
| 70–80 | 20 (29%) |
| 80–90 | 2 (3%) |
| Living alone | |
| No * | 43 (61%) |
| Population Categories | |
| Spinal cord injury | 22 (31%) |
| Stroke | 27 (39%) |
| Other disabilities | 13 (19%) |
| Older adults without self-identified disabilities | 8 (11%) |
| Loneliness Total | |
| Low (3–5) | 47 (67%) |
| High (6–9) | 23 (33%) |
| Depression | |
| No (0–7) | 58 (83%) |
| Yes (8–21) | 12 (17%) |
| Anxiety | |
| No (0–7) | 51 (73%) |
| Yes (8–10) | 19 (27%) |
| Perceived Social Support | |
| Low perceived social support (12–35) | 4 (6%) |
| Medium perceived social support (36–60) | 15 (21%) |
| High perceived social support (61–84) | 51 (73%) |
| Measures | |
| HADS–anxiety subscale | 4.73 ± 3.79 |
| HADS–depression subscale | 4.37 ± 3.59 |
| UCLA Three-Item Loneliness Scale | 4.94 ± 1.93 |
| MSPSS | 66.01 ± 15.52 |
| LSA | 51.16 ± 26.32 |

Abbreviations: HADS = Hospital Anxiety and Depression Scale; UCLA = University of California, Los Angeles; MSPSS = Multidimensional Scale of Perceived Social Support; LSA = Life-Space Assessment. * Individuals who lived with others including family or friends, some of whom may have provided care; none of the individuals lived in residential care settings.

### *3.2. Factors Associated with Loneliness*

The hierarchical regression analyses and results for the samples are presented in Table 2. Demographic factors alone explained almost none ($r^2 = -0.01$) of the variance in loneliness scores. This is while the full model (demographic + psychosocial factors) explained more than a third ($r^2 = 0.37$) of the variance in the model. Within the full model, anxiety and social support were the only factors significantly associated with loneliness.

**Table 2.** Hierarchical linear regression results with depression, anxiety, social support, and space mobility as the independent and loneliness as the dependent variables while controlling for age, sex, and disability status.

| Steps | Demographic Factors | | | | Demographic + Psychosocial Factors | | | |
|---|---|---|---|---|---|---|---|---|
| | β (SE) | Sβ (*p*-Value) | LB | UB | β (SE) | Sβ (*p*-Value) | LB | UB |
| (Constant) | 6.296 (1.217) | | 3.864 | 8.728 | 6.941 (1.502) | | 3.933 | 9.948 |
| Age | 0.002 (0.018) | 0.013 (0.921) | −0.033 | 0.037 | −0.006 (0.015) | −0.045 (0.679) | −0.035 | 0.023 |
| Sex | −0.275 (0.388) | −0.087 (0.481) | −1.050 | 0.500 | 0.010 (0.328) | 0.003 (0.976) | −0.646 | 0.666 |
| Disability | −0.725 (0.524) | −0.183 (0.171) | −1.771 | 0.321 | 0.040 (0.523) | 0.010 (0.940) | −1.007 | 1.086 |
| Anxiety | | | | | 0.180 (0.069) | 0.340 (0.011) | 0.042 | 0.318 |
| Depression | | | | | 0.122 (0.076) | 0.210 (0.116) | −0.031 | 0.275 |
| Social Support | | | | | −0.044 (0.015) | −0.315 (0.006) | −0.075 | -0.013 |
| Life-Space Mobility | | | | | 0.000 (0.009) | −0.005 (0.968) | −0.019 | 0.018 |
| Cum. Adj. $R^2$ | −0.01 | | | | 0.37 | | | |

Abbreviations: SE = standard Error, Sβ = standardized β, LB = lower bound 95% confidence interval for β, UB = upper bound 95% confidence internal for β.

## 4. Discussion

This study explored the association between anxiety, depression, social support, and mobility with loneliness in older adults and people with disabilities 10 months post COVID-19 restrictions. Participants were found to have low experiences of depression, anxiety, and loneliness. In addition, individuals scored on the higher end of the social support scale and reported high levels of perceived social support. This is while individuals' life-space mobility was in the lower range of the scale. The average LSA score in our sample (51.16) was lower than what was observed in studies assessing life-space mobility in individuals with spinal cord injuries [40].

Our findings regarding depression differed from studies on loneliness conducted pre-pandemic. In contrast with our findings, past studies indicated an association between depression and loneliness in the older adult population [30,42]. Loneliness and its association with depression is thought to be an adaptive function for human survival [43]. Cacioppo's evolutionary theory of loneliness suggests that loneliness functions to create a depressed mood as a survival method to encourage individuals to engage in social connections and hence maintain their social support [43]. However, more broad-sweeping contextual factors, such as the COVID-19 pandemic, may impact the association of depression and loneliness for older adults and people with disabilities, leading to no associations being found between the two in our study. Certain relationships may exist under normal circumstances; however, a change in external factors such as being in the midst of a global pandemic can lead to these relationships being disrupted and create relationships different from the ones outside the context of a pandemic. Previous studies indicated that more resilience is observed in individuals during a natural disaster such as a pandemic, resulting in individuals' growth and psychological gain from the adversity [44]. For example, a study completed on individuals living in France during the COVID-19 pandemic described this as "The Eye of the Hurricane" paradox, in that despite the expectations of a decrease in well-being and increase in feelings of depression, individuals reported feeling healthier with a stronger morale [45].

The observed positive association between anxiety and loneliness in this study is consistent with previous research. Others have illustrated that anxiety related to COVID-19 was significantly associated with loneliness, such that groups of older adults living in Northern California, USA experienced higher levels of anxiety when they were isolated and lonely due to COVID-19 physical restrictions [46]. Our findings expanded the understanding of this relationship to the populations of older adults and people with disabilities during the last phase of COVID-19 restrictions in BC.

Based on previous research, the lack of ability to independently mobilize oneself has been found to be associated with loneliness [31], which differs from our findings. With an increase in age and having different disabilities, individuals can often be restricted by their living environment [31]. Not being able to leave one's home can lead to feelings of loneliness as individuals can no longer maintain as many social ties or engage in community activities that they previously enjoyed [31]. Our study, however, did not find an association between mobility and loneliness. During the COVID-19 pandemic, a reduction in mobility was observed due to restrictions implemented to reduce the spread of the virus [47]. However, within the populations of older adults and people with disabilities, this reduction in mobility may not have been as different, as individuals may have already been facing lower mobility due to being restricted as a result of their underlying health conditions [31].

Around half of the participants in this study reported a high level of perceived social support, which may have been due, in part, to the support participants may have received by living with others. In addition, the data in this study were collected during the last phase of the reopening plans in BC when most social gatherings were allowed, hence leading to the high level of perceived social support. Furthermore, our findings on the association between social support and loneliness were similar to studies completed prior to the pandemic. Previous research found social support to be a protective factor and to decrease the levels of loneliness [48,49], which aligns with our findings that the higher the social support, the lower the loneliness levels were. Having strong social support allows individuals to be involved in different meaningful interactions, hence increasing their chances for satisfying their desired quality and quantity of social engagements, leading to lower feelings of loneliness [9,10]. In addition, strong social support can be beneficial as it allows individuals to rely on their community for dealing with challenges and stressful life events and may hence lead to lower loneliness levels during difficult life situations [50]. This is particularly important within older adults and people with disabilities, who were the focus of this study, especially during the COVID-19 pandemic, when they were exposed to extensive physical restrictions. These populations, in particular, may have experienced previous stressful events in life, such as health issues and limited independence [13,14]. As such, strong social support may have a greater importance for both older adults and people with disabilities.

There are three main implications of this research. First, given that anxiety has been positively associated with loneliness in older adults and people with disabilities during the COVID-19 pandemic, clinicians could provide interventions to reduce, prevent, and monitor anxiety in these populations. For example, providing reliable information about the pandemic to individuals can help reduce unnecessary worry and anxiety [6]. In addition making use of conscious breathing, mindfulness meditation, and other relaxation techniques can help alleviate anxiety in these individuals [6]. Next, as social support has shown to be associated with loneliness, these populations should be assisted with maintaining their quality and level of social support. Given that this may be difficult in a pandemic due to the implemented physical restrictions, technological tools such as video phone calls or online support groups may be helpful [51]. However, access to such tools may not be possible for all individuals due to reasons such as limited digital literacy or unaffordability. This limitation may be overcome by increasing digital literacy or creating local programs and services that allow for the maintenance of social support in a safe and physically distanced manner in populations that cannot take advantage of technological tools [51]. Finally, as our study cannot prove causality, it is possible that the converse of the relationships discussed above is true. For instance, decreasing loneliness could lead to lower anxiety levels rather than vice versa. As such, it is important to provide tools for reducing loneliness in older adults and people with disabilities. As loneliness is a subjective experience, tailored interventions suited for different individuals with different degrees of loneliness may be helpful [52].

*Limitations*

The participants in this study were limited to residents of British Columbia. Given that people in different parts of the world, and even within Canada, have experienced various levels and types of restrictions at different times, there may be different experiences of loneliness. For example, in cities, such as Wuhan, China, residents were placed under strict lockdowns that did not allow them to leave their homes without the government's permission [53]. This is while residents in countries such as Canada were never placed under such lockdown measures. Furthermore, our study included 70 participants for a regression model with 7 predictors, which lied at the lower end of the recommended observations per variable [54]. As such, the statistical power of this study may be limited to only detecting strong associations. Our sample may have also been biased as all participants had access to the internet and technological tools for completing the study. This may have limited the generalizability of the findings to people or groups that do not have the capacity or technology to access the internet and thus participate in the study. In addition, this study was cross-sectional in nature, and therefore could not prove causality. Furthermore, this study included both older adults and people with disabilities in the same analysis. However, given the different population groups and novelty of COVID-19, it is possible that the two populations had different experiences of loneliness. However, given that our sample was similar with respect to the experience of COVID-19 restrictions, as all resided in one province of Canada, it is likely that all experienced loneliness similarly. Despite these limitations, this study provides key information about loneliness in older adults and people with disabilities who have access to the internet and technological tools.

## 5. Conclusions

Anxiety and a lack of social support are both associated with loneliness among older adults and individuals with disabilities after 10 months of COVID-19 pandemic restrictions. Depression was not found to be associated with loneliness. The findings suggest that an increase in social support can decrease the levels of loneliness among older adults and people with disabilities during periods of physical restriction. These findings may inform future research developing programs and services to support older adults and individuals with disabilities with their levels of anxiety and social support during challenging times such as a pandemic. This may allow for loneliness levels to be managed, which is fundamental to individuals' wellbeing.

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**Data Availability Statement:** The data are not publicly available due to privacy issues.

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## References


1. Cucinotta, D.; Vanelli, M. WHO Declares COVID-19 a Pandemic. *Acta Biomed.* **2020**, *91*, 157–160. [CrossRef] [PubMed]
2. Considerations for Implementing and Adjusting Public Health and Social Measures in the Context of COVID-19. Available online: https://www.who.int/publications-detail-redirect/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance (accessed on 3 October 2021).
3. Flanagan, E.W.; Beyl, R.A.; Fearnbach, S.N.; Altazan, A.D.; Martin, C.K.; Redman, L.M. The Impact of COVID-19 Stay-at-home Orders on Health Behaviors in Adults. *Obesity* **2020**, *29*, 438–445. [CrossRef] [PubMed]
4. Okabe-Miyamoto, K.; Folk, D.; Lyubomirsky, S.; Dunn, E.W. Changes in Social Connection during COVID-19 Social Distancing: It's Not (Household) Size That Matters, It's Who You're with. *PLoS ONE* **2021**, *16*, e0245009. [CrossRef] [PubMed]
5. Galea, S.; Merchant, R.M.; Lurie, N. The Mental Health Consequences of COVID-19 and Physical Distancing: The Need for Prevention and Early Intervention. *JAMA Intern. Med.* **2020**, *180*, 817–818. [CrossRef] [PubMed]
6. Hwang, T.-J.; Rabheru, K.; Peisah, C.; Reichman, W.; Ikeda, M. Loneliness and Social Isolation during the COVID-19 Pandemic. *Int. Psychogeriatr.* **2020**, *32*, 1217–1220. [CrossRef]
7. O'Sullivan, R.; Burns, A.; Leavey, G.; Leroi, I.; Burholt, V.; Lubben, J.; Holt-Lunstad, J.; Victor, C.; Lawlor, B.; Vilar-Compte, M.; et al. Impact of the COVID-19 Pandemic on Loneliness and Social Isolation: A Multi-Country Study. *Int. J. Env. Res. Public Health* **2021**, *18*, 9982. [CrossRef]
8. Lampraki, C.; Hoffman, A.; Roquet, A.; Jopp, D.S. Loneliness during COVID-19: Development and Influencing Factors. *PLoS ONE* **2022**, *17*, e0265900. [CrossRef]
9. Hajek, A.; König, H.-H. Social Isolation and Loneliness of Older Adults in Times of the COVID-19 Pandemic: Can Use of Online Social Media Sites and Video Chats Assist in Mitigating Social Isolation and Loneliness? *Gerontology* **2020**, *67*, 121–124. [CrossRef]
10. Suzuki, K.; Dollery, B.E.; Kortt, M.A. Addressing Loneliness and Social Isolation amongst Elderly People through Local Co-Production in Japan. *Soc. Policy Adm.* **2021**, *55*, 674–686. [CrossRef]
11. Beal, C. Loneliness in Older Women: A Review of the Literature. *Issues Ment. Health Nurs.* **2006**, *27*, 795–813. [CrossRef]
12. Arpino, B.; Mair, C.A.; Quashie, N.T.; Antczak, R. Loneliness before and during the COVID-19 Pandemic—Are Unpartnered and Childless Older Adults at Higher Risk? *Eur. J. Ageing* **2022**, *19*, 1327–1338. [CrossRef]
13. Holmén, K.; Furukawa, H. Loneliness, Health and Social Network among Elderly People—A Follow-up Study. *Arch. Gerontol. Geriatr.* **2002**, *35*, 261–274. [CrossRef]
14. Macdonald, S.J.; Deacon, L.; Nixon, J.; Akintola, A.; Gillingham, A.; Kent, J.; Ellis, G.; Mathews, D.; Ismail, A.; Sullivan, S.; et al. 'The Invisible Enemy': Disability, Loneliness and Isolation. *Disabil. Soc.* **2018**, *33*, 1138–1159. [CrossRef]
15. Yeh, S.-C.J.; Liu, Y.-Y. Influence of Social Support on Cognitive Function in the Elderly. *BMC Health Serv. Res.* **2003**, *3*, 9. [CrossRef]
16. Itzick, M.; Kagan, M.; Tal-Katz, P. Perceived Social Support as a Moderator between Perceived Discrimination and Subjective Well-Being among People with Physical Disabilities in Israel. *Disabil. Rehabil.* **2018**, *40*, 2208–2216. [CrossRef]
17. Heinze, N.; Hussain, S.F.; Castle, C.L.; Godier-McBard, L.R.; Kempapidis, T.; Gomes, R.S.M. The Long-Term Impact of the COVID-19 Pandemic on Loneliness in People Living With Disability and Visual Impairment. *Front. Public Health* **2021**, *9*, 738304. [CrossRef]
18. Wong, S.Y.S.; Zhang, D.; Sit, R.W.S.; Yip, B.H.K.; Chung, R.Y.; Wong, C.K.M.; Chan, D.C.C.; Sun, W.; Kwok, K.O.; Mercer, S.W. Impact of COVID-19 on Loneliness, Mental Health, and Health Service Utilisation: A Prospective Cohort Study of Older Adults with Multimorbidity in Primary Care. *Br. J. Gen. Pract.* **2020**, *70*, e817–e824. [CrossRef]
19. Pettinicchio, D.; Maroto, M.; Chai, L.; Lukk, M. Findings from an Online Survey on the Mental Health Effects of COVID-19 on Canadians with Disabilities and Chronic Health Conditions. *Disabil. Health J.* **2021**, *14*, 101085. [CrossRef]
20. Reid, H.; Miller, W.C.; Esfandiari, E.; Mohammadi, S.; Rash, I.; Tao, G.; Simpson, E.; Leong, K.; Matharu, P.; Sakakibara, B.; et al. The Impact of COVID-19–Related Restrictions on Social and Daily Activities of Parents, People With Disabilities, and Older Adults: Protocol for a Longitudinal, Mixed Methods Study. *JMIR Res. Protoc.* **2021**, *10*, e28337. [CrossRef]
21. Boyle, C.A.; Fox, M.H.; Havercamp, S.M.; Zubler, J. The Public Health Response to the COVID-19 Pandemic for People with Disabilities. *Disabil. Health J.* **2020**, *13*, 100943. [CrossRef]
22. Kadambari, S.; Klenerman, P.; Pollard, A.J. Why the Elderly Appear to Be More Severely Affected by COVID-19: The Potential Role of Immunosenescence and CMV. *Rev. Med. Virol.* **2020**, *30*, e2144. [CrossRef] [PubMed]
23. Wu, B. Social Isolation and Loneliness among Older Adults in the Context of COVID-19: A Global Challenge. *Glob. Health Res. Policy* **2020**, *5*, 27. [CrossRef] [PubMed]
24. Steptoe, A.; Gessa, G.D. Mental Health and Social Interactions of Older People with Physical Disabilities in England during the COVID-19 Pandemic: A Longitudinal Cohort Study. *Lancet Public Health* **2021**, *6*, e365–e373. [CrossRef] [PubMed]
25. Malcolm, M.; Frost, H.; Cowie, J. Loneliness and Social Isolation Causal Association with Health-Related Lifestyle Risk in Older Adults: A Systematic Review and Meta-Analysis Protocol. *Syst. Rev.* **2019**, *8*, 48. [CrossRef] [PubMed]
26. Remillard, E.T.; Campbell, M.L.; Koon, L.M.; Rogers, W.A. Transportation Challenges for Persons Aging with Mobility Disability: Qualitative Insights and Policy Implications. *Disabil. Health J.* **2022**, *15*, 101209. [CrossRef]

27. Emerson, E.; Fortune, N.; Llewellyn, G.; Stancliffe, R. Loneliness, Social Support, Social Isolation and Wellbeing among Working Age Adults with and without Disability: Cross-Sectional Study. *Disabil. Health J.* **2021**, *14*, 100965. [CrossRef]
28. Lee, H.; Park, Y.R.; Kim, H.-R.; Kang, N.Y.; Oh, G.; Jang, I.-Y.; Lee, E. Discrepancies in Demand of Internet of Things Services Among Older People and People with Disabilities, Their Caregivers, and Health Care Providers: Face-to-Face Survey Study. *J. Med. Internet Res.* **2020**, *22*, e16614. [CrossRef]
29. Rodrigues, N.G.; Han, C.Q.Y.; Su, Y.; Klainin-Yobas, P.; Wu, X.V. Psychological Impacts and Online Interventions of Social Isolation amongst Older Adults during COVID-19 Pandemic: A Scoping Review. *J. Adv. Nurs.* **2021**, *78*, 609–644. [CrossRef]
30. Tiikkainen, P.; Heikkinen, R.-L. Associations between Loneliness, Depressive Symptoms and Perceived Togetherness in Older People. *Aging Ment. Health* **2005**, *9*, 526–534. [CrossRef]
31. Moeyersons, M.; De Vliegher, K.; Huyghe, B.; De Groof, S.; Milisen, K.; de Casterlé, B.D. 'Living in a Shrinking World'—The Experience of Loneliness among Community-Dwelling Older People with Reduced Mobility: A Qualitative Grounded Theory Approach. *BMC Geriatr.* **2022**, *22*, 285. [CrossRef]
32. Steptoe, A.; Shankar, A.; Demakakos, P.; Wardle, J. Social Isolation, Loneliness, and All-Cause Mortality in Older Men and Women. *Proc. Natl. Acad. Sci. USA* **2013**, *110*, 5797–5801. [CrossRef]
33. Neto, F. Psychometric Analysis of the Short-Form UCLA Loneliness Scale (ULS-6) in Older Adults. *Eur. J. Ageing* **2014**, *11*, 313–319. [CrossRef]
34. Stern, A.F. The Hospital Anxiety and Depression Scale. *Occup. Med.* **2014**, *64*, 393–394. [CrossRef]
35. Hansson, M.; Chotai, J.; Nordstöm, A.; Bodlund, O. Comparison of Two Self-Rating Scales to Detect Depression: HADS and PHQ-9. *Br. J. Gen. Pract.* **2009**, *59*, e283–e288. [CrossRef]
36. Bjelland, I.; Dahl, A.A.; Haug, T.T.; Neckelmann, D. The Validity of the Hospital Anxiety and Depression Scale: An Updated Literature Review. *J. Psychosom. Res.* **2002**, *52*, 69–77. [CrossRef]
37. The Multidimensional Scale of Perceived Social Support: EBSCOhost. Available online: https://web.a.ebscohost.com/ehost/detail/detail?vid=0&sid=e6e0a3ae-a4c9-47bd-88af-c2c73c63c9cf%40sessionmgr4008&bdata=JkF1dGhUeXBlPXNoaWImc2l0ZT1laG9zdC1saXZlJnNjb3BlPXNpdGU%3d#AN=6380172&db=bsu (accessed on 8 October 2021).
38. Zimet, G.D.; Dahlem, N.W.; Zimet, S.G.; Farley, G.K. The Multidimensional Scale of Perceived Social Support. *J. Personal. Assess.* **1988**, *52*, 30. [CrossRef]
39. Johnson, J.; Rodriguez, M.A.; Snih, S.A. Life-Space Mobility in the Elderly: Current Perspectives. *Clin. Interv. Aging* **2020**, *15*, 1665–1674. [CrossRef]
40. Lanzino, D.; Sander, E.; Mansch, B.; Jones, A.; Gill, M.; Hollman, J. Life Space Assessment in Spinal Cord Injury. *Top. Spinal Cord Inj. Rehabil.* **2016**, *22*, 173–182. [CrossRef]
41. Johnston, R.; Jones, K.; Manley, D. Confounding and Collinearity in Regression Analysis: A Cautionary Tale and an Alternative Procedure, Illustrated by Studies of British Voting Behaviour. *Qual. Quant.* **2018**, *52*, 1957–1976. [CrossRef]
42. Cacioppo, J.T.; Hughes, M.E.; Waite, L.J.; Hawkley, L.C.; Thisted, R.A. Loneliness as a Specific Risk Factor for Depressive Symptoms: Cross-Sectional and Longitudinal Analyses. *Psychol. Aging* **2006**, *21*, 140–151. [CrossRef]
43. Cacioppo, J.T.; Cacioppo, S.; Boomsma, D.I. Evolutionary Mechanisms for Loneliness. *Cogn. Emot.* **2014**, *28*, 3–21. [CrossRef] [PubMed]
44. Van Winkle, Z.; Ferragina, E.; Recchi, E. The Unexpected Decline in Feelings of Depression among Adults Ages 50 and Older in 11 European Countries amid the COVID-19 Pandemic. *Socius* **2021**, *7*. [CrossRef]
45. Recchi, E.; Ferragina, E.; Helmeid, E.; Pauly, S.; Safi, M.; Sauger, N.; Schradie, J. The "Eye of the Hurricane" Paradox: An Unexpected and Unequal Rise of Well-Being During the COVID-19 Lockdown in France. *Res. Soc. Stratif. Mobil.* **2020**, *68*, 100508. [CrossRef] [PubMed]
46. Gaeta, L.; Brydges, C.R. Coronavirus-Related Anxiety, Social Isolation, and Loneliness in Older Adults in Northern California during the Stay-at-Home Order. *J. Aging Soc. Policy* **2021**, *33*, 320–331. [CrossRef] [PubMed]
47. Ong, J.L.; Lau, T.; Massar, S.A.A.; Chong, Z.T.; Ng, B.K.L.; Koek, D.; Zhao, W.; Yeo, B.T.T.; Cheong, K.; Chee, M.W.L. COVID-19-Related Mobility Reduction: Heterogenous Effects on Sleep and Physical Activity Rhythms. *Sleep* **2021**, *44*, zsaa179. [CrossRef]
48. Ogińska-Bulik, N.; Michalska, P. Psychological Resilience and Secondary Traumatic Stress in Nurses Working with Terminally Ill Patients—The Mediating Role of Job Burnout. *Psychol. Serv.* **2020**, *18*, 398–405. [CrossRef]
49. Prevalence of Internet Addiction and Its Association with Social Support and Other Related Factors among Adolescents in China—ClinicalKey. Available online: https://www.clinicalkey.com/#!/content/playContent/1-s2.0-S014019711630077X?returnurl=null&referrer=null (accessed on 8 October 2021).
50. McNamara, N.; Stevenson, C.; Costa, S.; Bowe, M.; Wakefield, J.; Kellezi, B.; Wilson, I.; Halder, M.; Mair, E. Community Identification, Social Support, and Loneliness: The Benefits of Social Identification for Personal Well-Being. *Br. J. Soc. Psychol.* **2021**, *60*, 1379–1402. [CrossRef]
51. Cugmas, M.; Ferligoj, A.; Kogovšek, T.; Batagelj, Z. The Social Support Networks of Elderly People in Slovenia during the COVID-19 Pandemic. *PLoS ONE* **2021**, *16*, e0247993. [CrossRef]
52. Fakoya, O.A.; McCorry, N.K.; Donnelly, M. Loneliness and Social Isolation Interventions for Older Adults: A Scoping Review of Reviews. *BMC Public Health* **2020**, *20*, 129. [CrossRef]

53. Zhou, T.; Nguyen, T.T.; Zhong, J.; Liu, J. A COVID-19 Descriptive Study of Life after Lockdown in Wuhan, China. *R. Soc. Open Sci.* **2020**, *7*, 200705. [CrossRef]
54. Green, S.B. How Many Subjects Does It Take To Do A Regression Analysis. *Multivar. Behav Res* **1991**, *26*, 499–510. [CrossRef]