

# Caregivers' Concerns About Assisted Living Residents' Mental Health During the COVID-19 Pandemic: A Cross-Sectional Survey Study

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## Abstract

Family or friend caregivers' concerns about assisted living (AL) residents' mental health are reflective of poor resident and caregiver mental health. COVID-19-related visiting restrictions increased caregiver concerns, but research on these issues in AL is limited. Using web-based surveys with 673 caregivers of AL residents in Western Canada, we assessed the prevalence and correlates of moderate to severe caregiver concerns about residents' depressed mood, loneliness, and anxiety in the 3 months before and after the start of the COVID-19 pandemic. Caregiver concerns doubled after the start of the pandemic (resident depressed mood: 23%–50%, loneliness: 29%–62%, anxiety: 24%–47%). Generalized linear mixed models identified various modifiable risk factors for caregiver concerns (e.g., caregivers' perception that residents lacked access to counseling services or not feeling well informed about and involved in resident care). These modifiable factors can be targeted in efforts to prevent or mitigate caregiver concerns and resident mental health issues.

## Keywords

assisted living facilities, family/friend caregivers, frail elderly, mental health, depressive symptoms, loneliness, anxiety, COVID-19, health surveys, cross-sectional studies

COVID-19 has led to higher rates of death and suffering among nursing home and assisted living (AL) residents, compared with the general older adult population (Chu et al., 2021; Dykgraaf et al., 2021; Werner et al., 2020). Visitor restrictions intended to protect resident safety have been associated with deteriorated resident, family or friend caregiver, and care staff mental health (Gaugler & Mitchell, 2022; Hindmarch et al., 2021; Kemp, 2021; Sorrell, 2021; Veiga-Seijo et al., 2022). Residents' families and friends are more than visitors—they are caregivers (Kemp, 2021). They serve critical roles as advocates and legal decision makers for residents with cognitive impairment and they provide essential care and support, including emotional and social care, engaging residents in activities, providing information to care staff, facilitating access to health care services, and assisting with daily activities (Kemp, 2021).

Being unable to visit residents to provide these essential supports increased caregivers' concerns about deteriorating

resident mental because of residents' prolonged social isolation, decreasing physical health and functioning, and residents dying without their caregiver's support (Gaugler & Mitchell, 2022; Hindmarch et al., 2021; Kemp, 2021;

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Veiga-Seijo et al., 2022). This may be especially true in assisted living, a congregate care setting intended to serve older adults with lower care needs than those in nursing homes that aim to promote resident autonomy and privacy in a home-like environment (American Geriatrics Society, 2020; Coe & Van Houtven, 2020; Zimmerman et al., 2020). Assisted living offers fewer services than nursing homes, has lower staffing and skill mix levels, and no onsite 24-hr registered nursing care (Dys et al., 2021; Gibbons & Kowalewski, 2021; Hogan et al., 2012, 2014; Maxwell et al., 2013, 2015). Consequently, more caregiver involvement in resident care is expected in assisted living than in nursing homes (Baumbusch & Phinney, 2014; Dys et al., 2021; Gibbons & Kowalewski, 2021; Puurveen et al., 2018). At the same time, assisted living and nursing home residents share a high degree of vulnerability (Hogan et al., 2012, 2014; Maxwell et al., 2013, 2015). Assisted living residents are of advanced age (average 84 years) and exhibit high rates of dementia ( $\geq 60\%$ ), mental health conditions (34% with depression), and multimorbidity (average of five conditions; Hogan et al., 2012, 2014; Maxwell et al., 2013, 2015). However, far less research is available on the impact of COVID-19 in assisted living, compared with nursing homes (American Geriatrics Society, 2020; Coe & Van Houtven, 2020; Zimmerman et al., 2020). This is a critical knowledge gap given that assisted living spaces make up more than 40% of all publicly funded facility-based continuing care spaces (Statistics Canada, 2016; Zimmerman et al., 2020) and that the growth of publicly funded assisted living has outpaced that of nursing homes (Alberta Health Services [AHS], 2020; Grabowski et al., 2012).

Qualitative and descriptive studies (largely in nursing homes or including, but not separately analyzing, assisted living and nursing home settings; Hindmarch et al., 2021; Mitchell et al., 2021; Nash et al., 2021; O’Caoimh et al., 2020; Parmar et al., 2021; Wammes et al., 2020; Yeh et al., 2020) suggest high rates of caregiver concerns about resident mental health during the pandemic. Between 76% (Wammes et al., 2020) and 90% (Mitchell et al., 2021) of caregivers expressed concerns about resident loneliness, 50% (O’Caoimh et al., 2020) to 66% (Wammes et al., 2020) about mood issues, 62% about poor quality of life (Wammes et al., 2020), and 39% about psychological stress (39%; Yeh et al., 2020). Caregiver concerns about resident care can indicate unmet care needs that care staff may be unaware of and that residents may not be willing or able to express (Reader & Gillespie, 2013). Failing to act upon these concerns can lead to resident neglect and harm (Reader & Gillespie, 2013). Furthermore, caregiver concerns about resident care and difficulties staying involved in resident care can negatively affect caregivers’ mental health (Puurveen et al., 2018). In our own research (Lane et al., 2022), we surveyed 673 caregivers of AL residents in the Canadian provinces of Alberta and British Columbia between October 2020 and March 2021 and found significant anxiety in 29% and clinically

meaningful depressive symptoms in 39% of the participants. Those whose concerns about the resident being depressed increased or remained consistently high in the 3 months after (vs. before) the start of the pandemic were more likely (risk ratios between 1.6 and 2.1) to experience moderate or severe depressive and anxiety symptoms (Lane et al., 2022). During the Severe Acute Respiratory Syndrome (SARS) outbreaks in Toronto, Canada, in 2003, caregivers of nursing home residents experienced fear, worry, loss of control, frustration, and guilt as a consequence of visiting restrictions (McCleary et al., 2006). We lack research on these issues in AL, including robust quantitative evidence on modifiable factors associated with caregiver concerns during the COVID-19 pandemic.

This study aimed to assess the prevalence of caregiver concerns about AL residents’ depressive symptoms, loneliness, and anxiety in the 3 months before and after the start of the pandemic in Canada and modifiable factors associated with these concerns during the pandemic. Informed by recent qualitative and descriptive findings (Hindmarch et al., 2021; Mitchell et al., 2021; Nash et al., 2021; O’Caoimh et al., 2020; Yeh et al., 2020), our hypothesis was that adjusting for sociodemographic characteristics, the following caregiver reported outcomes would be significantly associated with decreased levels of caregivers’ concerns about residents’ mental health: (a) residents’ access to care services, (b) adequate information communicated by the assisted living home about restrictions and resident care, and (c) caregivers’ involvement in resident care.

## Method

This cross-sectional analysis used baseline data from a prospective cohort study (COVID-19 and Caregivers of Assisted living Residents: their Experiences and Support needs; COVCARES-AB/BC). The Survey Research Center (SRC) at the University of Waterloo administered an online survey to caregivers of assisted living residents in Alberta and British Columbia, Canada (October 28, 2020 to March 31, 2021). Participants received a \$25 coffee gift card.

## Setting and Sample

We invited all eligible assisted living homes in Alberta ( $n = 163$ ) and British Columbia ( $n = 137$ ) to participate. Homes were eligible if they (a) were licensed and publicly subsidized, (b) had been in operation for 6+ months, (c) served a minimum number of residents aged 65+ years (four in homes below and 10 in homes above regional median bed-size), and (d) did not primarily serve psychiatric clients. Participating homes shared our recruitment materials and online survey link with their caregivers (e.g., via mailing lists, social media, printed hardcopies). We also shared the survey link via social media, websites, mailing lists, and newsletters. Caregivers were eligible if they (a) were 18+

years old, (b) cared for an assisted living resident aged 65+ years who had lived in the assisted living home for 3+ months prior to March 1, 2020, and (c) were the person most informed about or most involved in the resident's care. Our sample size of 673 participants was sufficient to detect differences in our binary outcomes (moderate to extreme caregiver concerns) as small as 10% with 82% power at a 5% significance level (two-sided  $z$  test).

### Measures

Our survey was based on a prior, validated assisted living caregiver survey in Alberta (Strain et al., 2011; Wanless et al., 2011). COVID-19-related items were from national COVID-19 surveys (Raina et al., 2021; Statistics Canada, 2020; Wister et al., 2022) with some modifications for the AL context. The survey assessed caregivers' sociodemographic characteristics, types and frequency of care activities they were involved in, residents' access to care services, concerns about residents' physical and mental health, caregivers' physical and mental health, caregivers' social support, perceived information about the residents' situation communicated by the assisted living home, and opportunities to stay well informed and engaged in the care of the resident. Caregivers rated the outcomes in the 3 months before versus after March 1, 2020, because Alberta and British Columbia initiated visitor restrictions to AL in March 2020 (University of Toronto, 2020).

### Concerns About Resident Mental Health

We asked caregivers about their level of concern with the resident's depressed mood, loneliness, or anxiety in the 3 months pre versus post-March 1, 2020. Caregivers rated each of the three items for each of the two time periods on a 5-point scale ranging from extremely concerned to not at all concerned. Moderate to extreme versus lower levels of concerns post March 1, 2020 were our dependent variables.

### Independent Variables and Covariates

We selected the main independent variables (Table 1) based on previous qualitative and descriptive studies (mostly in long-term care; Hindmarch et al., 2021; Mitchell et al., 2021; Nash et al., 2021; O'Caoimh et al., 2020; Yeh et al., 2020) that suggested possible associations of these variables with assisted living caregiver concerns about resident care. We included demographic variables, caregivers' relationship with the resident, and pandemic-related changes in income as covariates (Table 1).

### Statistical Analyses

We used SAS software version 9.4 (Copyright © 2016 by SAS Institute Inc., Cary, NC, USA) for all analyses. We

compared the frequency and proportion of caregivers who were moderately to extremely concerned about resident mental health (depressed mood, loneliness, anxiety) in the 3 months pre- versus post-March 1, 2020, using MacNemar's test. We report the frequency and proportion of study outcomes and covariates overall, and we assessed bivariate differences in study variables between caregivers who were moderately/severely versus less concerned about resident depressed mood, loneliness, or anxiety after March 1, 2020.

To assess the association of covariates with each of the three dichotomous concern variables, we specified generalized linear mixed models with a log link and a binary distribution. Therefore, model estimates are risk ratios (Zou, 2004), which are less biased than odds ratios if outcomes are not rare in all strata (Cummings, 2009). We first ran unadjusted models and then added covariates one at a time, starting with our independent variables, followed by caregiver characteristics. Multicollinearity assessments did not suggest any issues. We excluded 3 covariates from our adjusted models due to a lack of variance (assisted living homes informing caregivers about infection control policies and measures, and assisted living homes informing caregivers about visitor restrictions) or lack of an association ( $p \geq .1$ ) with either of the three caregiver concern variables in our bivariate analyses (assisted living homes informing caregivers about COVID-19 outbreaks among residents). We included all other covariates in all three adjusted models for comparability. Missing data rates were generally small (well below 5%) for most variables but relatively higher for caregiver relationship to the resident (13.4%) and household income (13.7%), and responses were not missing completely at random. Therefore, we performed multiple imputations (16 imputed data sets, corresponding to the proportion of records with missing data), using the fully conditional method (van Buuren, 2007) and a generalized logit distribution (Rubin, 1987).

We conducted sensitivity analyses to assess whether adding facility-level variables (province, for-profit vs. not-for-profit ownership, and large vs. small size) to the models, and adding a facility-level random intercept (based on a multi-level model to account for clustering of caregivers within assisted living homes and to assess the level of intracluster correlation) altered our conclusions.

### Ethics Approval

Our study received ethics approval from the Research Ethics Boards at the Universities of Alberta (Pro00101048), Calgary (REB20-1544), British Columbia (H20-01732), and Waterloo (ORE#42494). We obtained operational approvals from participating assisted living homes and health regions (five Health Zones in Alberta and five Regional Health Authorities in British Columbia) as needed. The study information was provided to participants at the beginning of the survey and participants agreed to participate in the study by submitting their survey.

**Table 1.** Dependent Variables and Covariates.

Variable	Wording	Response options	Derived variable
Dependent variables			
Resident access to counseling	Thinking about the 3 months <b>AFTER</b> March 1, 2020: Did your [family member/friend] have access to the following therapies or health care if needed? <b>Counseling from a mental health or social work provider</b>	No Yes I don't know Prefer not to answer	NA
Informed about outbreak among residents	Were you made aware of whether or not the facility experienced an outbreak (i.e., two or more cases) of COVID-19 among <u>residents</u> ?	No, I was not informed of an outbreak among residents Yes, I was informed of an outbreak among residents There were no known outbreaks among residents during this time period	NA
Informed about outbreak among staff	Were you made aware of whether or not the facility experienced an outbreak (i.e., two or more cases) of COVID-19 among <u>staff</u> ?	No, I was not informed of an outbreak among residents Yes, I was informed of an outbreak among residents There were no known outbreaks among residents during this time period	NA
Informed about COVID-19 testing and test results	Were you made aware of whether or not your [family member/friend] was tested for COVID-19?	No, I was not informed s/he was tested Yes, I was informed s/he was tested There was no known testing during this time period	No testing Neither informed about test nor results Informed about test but not results
Information about infection prevention and control policies	Did the facility/staff inform you about COVID-19 testing results for <b>your</b> [family member/friend]?	No Yes Not applicable	Informed about test and results NA
Information about visitor restrictions	Did the facility/staff inform you about visitor restrictions preventing your access to the facility to see and care for your [family member/friend]?	No Yes	NA
Feeling well informed and involved	During the 3 months <b>AFTER</b> March 1, 2020, do you feel the facility/staff created or facilitated opportunities for you to be well informed and involved in the care and wellbeing of your [family member/friend]?	No Yes	NA

(continued)

Table 1. (continued)

Variable	Wording	Response options	Derived variable
Involvement in mental health care of the residents	Thinking about the 3 months <b>BEFORE</b> March 1, 2020: Did you provide help to your [family member/friend] with the following activities? <b>Attending to Mental Health Needs. For example, reassuring if anxious, providing/arranging for supportive care for symptoms of depression.</b> Thinking about the 3 months <b>AFTER</b> March 1, 2020: Did you provide help to your [family member/friend] with the following activities? <b>Attending to Mental Health Needs. For example, reassuring if anxious, providing/arranging for supportive care for symptoms of depression.</b>	No Yes  No Yes	Not involved before and after Involved before but not after Involved before and after or only after
Covariates			
Relationship to the resident	What is your relationship to the family member or friend you [help] care for?	Son/daughter Parent/sibling/spouse Other Woman Man Prefer to self-describe (please specify) Prefer not to answer	NA NA
Gender	What best describes your gender?	<55 years 55–64 years 65+ years	NA
Age	Which age group do you belong to?	Married or common-law Widowed Divorced or separated Never married Other, specify:	Married/common-law (yes/no)
Marital status	At present, are you married, in a common-law relationship, widowed, divorced, separated, or have you never been married?	High school or less College or trade Academic Various options	NA
Education	What is the highest level of formal education that you have <b>completed</b> ?	No Yes	White (yes/no) There was an income reduction and participant was very or extremely concerned (yes/no)
Ethnic/cultural identity	What is your ethnic or cultural identity?	Not at all Somewhat Very Extremely	
Concerned about income reduction	During the 3 months <b>AFTER</b> March 1, 2020, was there a reduction in your total household income? How concerned are you about these financial changes?		



**Table 2.** Distribution of Assisted Living Home Characteristics and Distribution of Caregiver Surveys by Assisted Living Home Characteristics.

Assisted living home characteristics	Assisted living homes ( <i>n</i> = 136)		Caregiver surveys ( <i>n</i> = 669)	
	<i>N</i>	%	<i>N</i>	%
<b>Province/Region</b>				
Alberta	94	69.12	544	81.32
Calgary Zone	15	11.03	29	4.33
Central Zone	15	11.03	80	11.96
Edmonton Zone	35	25.74	221	33.03
North Zone	11	8.09	60	8.97
South Zone	18	13.24	154	23.02
British Columbia	42	30.88	125	18.68
Fraser Health	17	12.5	62	9.27
Interior Health	15	11.03	28	4.19
Vancouver Coastal Health	5	3.68	17	2.54
Vancouver Island Health	5	3.68	18	2.69
<b>Ownership model</b>				
For-profit	79	58.09	365	54.56
Not-for-profit	57	41.91	304	45.44
<b>Location</b>				
Rural	45	33.09	203	30.34
Urban	91	66.91	466	69.66
<b>Size category</b>				
Large	83	61.03	445	66.52
Small	53	38.97	224	33.48

## Results

Our sample included 673 caregivers who cared for residents in one of 136 identified AL homes (45% of all eligible homes). Due to our sampling and recruitment approach, we have no information on the number of caregivers who received our online survey link and cannot provide an accurate caregiver response rate. AL homes (Table 2) included small/large, urban/rural, and for-profit/not-for-profit facilities in 5/5 Health Zones in Alberta and 4/5 Regional Health Authorities in British Columbia. Most caregivers (Table 3) were women, 55 years or older, married, White, had higher levels of education, and reported a household income of \$50,000 or more.

Almost 36% of the participants indicated that the resident did not have access to counseling during the first wave of the pandemic. Of those who reported outbreaks among residents (*n* = 211) or staff (*n* = 264) in their resident's home, more than 25% and 30%, respectively, were not informed about the outbreak. Of the 364 caregivers whose resident was tested for COVID-19, more than 50% said they were not informed about the test being done, the test result, or both. Although almost all caregivers were informed about infection control policies and visitor restrictions, 25% of the caregivers felt the AL home did not create opportunities for them to be well informed or involved in the resident's care. Almost half of the caregivers were involved in attending to the resident's mental health needs

before and after the start of the pandemic, whereas 13% were involved before but not after.

Caregiver concerns about all three mental health conditions of interest were high before the start of the pandemic (Figure 1) and substantially increased during Wave 1 of the pandemic. In all three adjusted models (Table 4), caregivers' reports about residents' lack of access to counseling and their involvement in resident mental health care (pre- and/or both pre-post March 1, 2020) were strong positive correlates of their concern about resident mental health. After adjustment, women were more likely to be concerned about the resident's depressed mood, and non-White caregivers were more concerned about the resident's depressed mood and anxiety. Not being informed about COVID-19 outbreaks among care staff, relationship to the resident, caregiver age, and concerns about changes in income were statistically nonsignificant in the adjusted models. Learning that the resident received a COVID-19 test increased caregiver likelihood of being concerned about the resident's depressed mood (but not loneliness and anxiety) regardless of the extent of information provided by the AL home.

No facility variables were associated with caregiver concerns. Their addition to the models decreased model fit and did not change our conclusions. The same is true for adding a facility-level random intercept. The intracluster correlations were small and statistically nonsignificant (depressed mood: 0.000, *p* = 1.000; loneliness: 0.010, *p* = .390, anxiety: 0.003, *p* = .454).

**Table 3.** Caregiver Characteristics, Caregiver Involvement in the Resident's Mental Health Care, and Caregiver-Reported Information and Support by Assisted Living Homes—Overall and by Presence/Absence of Caregiver Concerns About the Resident's Mental Health.

Participant characteristics	Caregiver moderately or severely concerned about resident's . . .						
	Total	Depressive mood		Loneliness		Anxiety	
		Yes	No	Yes	No	Yes	No
Number of participants	673	332	333	409	255	312	349
Age							
<55 years	125 (18.6%)	74 (22.4%)	49 (14.7%)	85 (20.9%)	38 (14.9%)	64 (20.6%)	59 (16.9%)
55–64 years	284 (42.3%)	141 (42.7%)	139 (41.7%)	185 (45.5%)	95 (37.3%)	138 (44.5%)	141 (40.4%)
65+ years	262 (39.1%)	115 (34.8%)	145 (43.5%)	137 (33.7%)	122 (47.8%)	108 (34.8%)	149 (42.7%)
<i>p</i> value	—	<b>.0140</b>	—	<b>.0009</b>	—	<b>.1062</b>	—
Women	515 (76.8%)	268 (81.2%)	239 (71.8%)	325 (79.9%)	181 (71.0%)	248 (80.0%)	255 (73.1%)
<i>p</i> value	—	<b>.0061</b>	—	<b>.0150</b>	—	<b>.0568</b>	—
Married/common law	555 (83.1%)	270 (82.1%)	278 (84.0%)	335 (82.5%)	213 (84.2%)	256 (82.8%)	290 (83.6%)
<i>p</i> value	—	<b>.8242</b>	—	<b>.9820</b>	—	<b>.9685</b>	—
Relationship to resident							
Daughter or son	502 (74.6%)	244 (73.5%)	250 (75.1%)	311 (76.0%)	183 (71.8%)	232 (74.4%)	258 (73.9%)
Parent, sibling, spouse	81 (12.0%)	41 (12.3%)	40 (12.0%)	39 (9.5%)	41 (16.1%)	37 (11.9%)	44 (12.6%)
Other	90 (13.4%)	47 (14.2%)	43 (12.9%)	59 (14.4%)	31 (12.2%)	43 (13.8%)	47 (13.5%)
<i>p</i> value	—	<b>.8761</b>	—	<b>.0388</b>	—	<b>.9664</b>	—
Education							
High school or less	176 (26.6%)	79 (24.3%)	95 (28.9%)	99 (24.6%)	75 (29.9%)	76 (24.9%)	95 (27.5%)
College or trade	283 (42.8%)	137 (42.2%)	141 (42.9%)	169 (42.0%)	109 (43.4%)	133 (43.6%)	144 (41.7%)
Academic	203 (30.7%)	109 (33.5%)	93 (28.3%)	134 (33.3%)	67 (26.7%)	96 (31.5%)	106 (30.7%)
<i>p</i> value	—	<b>.2566</b>	—	<b>.1495</b>	—	<b>.7494</b>	—
White race/ethnicity	598 (89.9%)	286 (87.5%)	305 (92.4%)	362 (89.6%)	228 (90.5%)	267 (87.3%)	320 (92.2%)
<i>p</i> value	—	<b>.0380</b>	—	<b>.7902</b>	—	<b>.0380</b>	—
Household income before March 1, 2020							
<\$50,000	136 (23.4%)	76 (26.2%)	57 (20.1%)	42 (23.7%)	49 (22.2%)	74 (27.5%)	57 (18.8%)
\$50,000–<\$80,000	160 (27.5%)	76 (26.2%)	84 (29.6%)	92 (26.0%)	67 (30.3%)	79 (29.4%)	80 (26.4%)
\$80,000–<\$100,000	101 (17.4%)	45 (15.5%)	54 (19.0%)	55 (15.5%)	45 (20.4%)	36 (13.4%)	63 (20.8%)
\$100,000 or more	184 (31.7%)	93 (32.1%)	89 (31.3%)	123 (34.7%)	60 (27.1%)	80 (29.7%)	103 (34.0%)
<i>p</i> value	—	<b>.4093</b>	—	<b>.2495</b>	—	<b>.0313</b>	—
Concerning income reduction after March 1, 2020	54 (8.3%)	37 (11.5%)	16 (4.9%)	40 (10.1%)	13 (5.2%)	37 (12.3%)	16 (4.7%)
<i>p</i> value	—	<b>.0025</b>	—	<b>.0382</b>	—	<b>.0005</b>	—
Resident access to counseling after March 1, 2020							
Yes	139 (21.4%)	58 (18.0%)	81 (25.2%)	65 (16.4%)	73 (29.7%)	56 (18.5%)	82 (24.1%)
No	232 (35.6%)	148 (45.8%)	82 (25.5%)	173 (43.6%)	56 (22.8%)	141 (46.7%)	88 (25.9%)
Don't know, prefer not to answer	280 (43.0%)	117 (36.2%)	159 (49.4%)	159 (40.1%)	117 (47.6%)	105 (34.8%)	170 (50.0%)
<i>p</i> value	—	<b>&lt;.0001</b>	—	<b>&lt;.0001</b>	—	<b>&lt;.0001</b>	—
Informal about COVID-19 outbreak among residents							
No outbreak	458 (68.5%)	220 (66.3%)	233 (70.6%)	274 (67.0%)	177 (70.2%)	204 (65.4%)	244 (70.5%)
Informed	157 (23.5%)	81 (24.4%)	75 (22.7%)	100 (24.5%)	56 (22.2%)	78 (25.0%)	78 (22.5%)

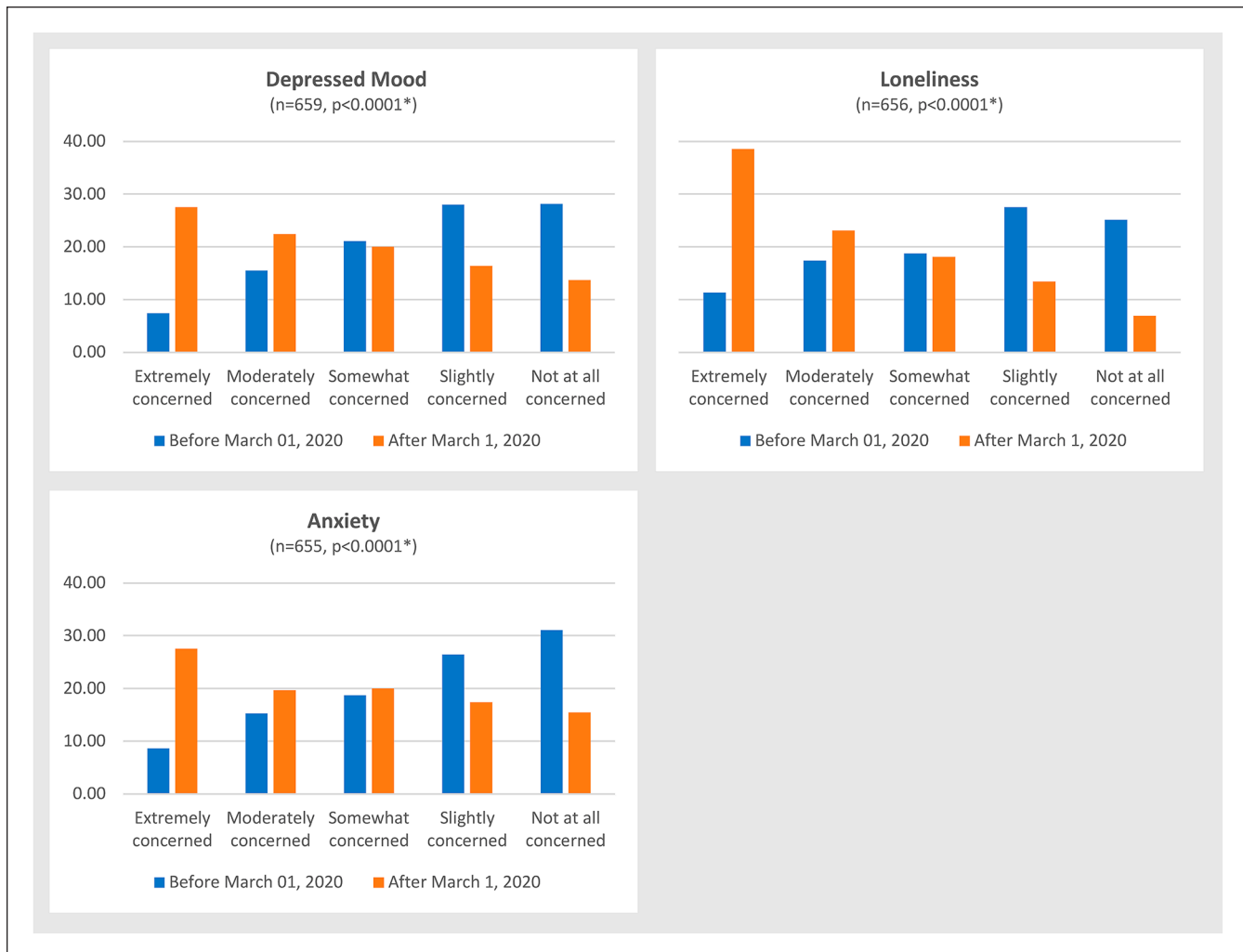
(continued)

**Table 3. (continued)**

Participant characteristics	Caregiver moderately or severely concerned about resident's . . .							
	Depressive mood		Loneliness		Anxiety			
	Yes	No	Yes	No	Yes	No	Yes	No
Not informed	31 (9.3%)	22 (6.7%)	35 (8.6%)	19 (7.5%)	30 (9.6%)	24 (6.9%)		
<i>p</i> value	.3448		.6900		.2952			
Informed about COVID-19 outbreak among staff								
No outbreak	184 (56.1%)	214 (64.9%)	230 (56.9%)	167 (66.1%)	167 (54.1%)	226 (65.5%)		
Informed	93 (28.4%)	89 (27.0%)	113 (28.0%)	69 (27.3%)	93 (30.1%)	89 (25.8%)		
Not informed	51 (15.6%)	27 (8.2%)	61 (15.1%)	17 (6.7%)	49 (15.9%)	30 (8.7%)		
<i>p</i> value	.0077		.0025		.0033			
Informed about resident's COVID-19 test								
No test	125 (38.2%)	172 (52.1%)	167 (41.2%)	130 (51.8%)	124 (40.3%)	171 (49.6%)		
Test and results	81 (24.8%)	90 (27.3%)	96 (23.7%)	75 (29.9%)	74 (24.0%)	96 (27.8%)		
Test, not results	57 (17.4%)	35 (10.6%)	65 (16.0%)	25 (10.0%)	51 (16.6%)	39 (11.3%)		
Neither test nor results	64 (19.6%)	33 (10.0%)	77 (19.0%)	21 (8.4%)	59 (19.2%)	39 (11.3%)		
<i>p</i> value	.0001		<.0001		.0031			
Informed about infection control policies/measures	314 (94.9%)	315 (94.6%)	382 (93.6%)	246 (96.5%)	292 (93.9%)	333 (95.4%)		
<i>p</i> value	1.0000		.1523		.3910			
Informed about visitor restrictions	318 (96.7%)	321 (97.0%)	390 (96.3%)	248 (97.6%)	297 (96.1%)	338 (97.4%)		
<i>p</i> value	.8287		.3737		.3810			
Feeling well informed/involved	221 (67.0%)	278 (84.0%)	275 (67.9%)	224 (87.8%)	204 (65.8%)	293 (84.4%)		
<i>p</i> value	<.0001		<.0001		<.0001			
Involvement in attending to resident's mental health needs								
Pre and post or only post	193 (58.7%)	115 (34.8%)	220 (54.2%)	88 (34.9%)	190 (61.3%)	115 (33.3%)		
Pre, not post	54 (16.4%)	31 (9.4%)	60 (14.8%)	24 (9.5%)	50 (16.1%)	35 (10.1%)		
Neither pre nor post	82 (24.9%)	184 (55.8%)	126 (31.0%)	140 (55.6%)	70 (22.6%)	195 (56.5%)		
<i>p</i> value	<.0001		<.0001		<.0001			

*p* values are based on Fisher's exact tests. *p* values >0.05 (bold) were considered statistically significant.





**Figure 1.** Distribution of caregiver concerns about the resident's depressed mood, loneliness and anxiety in the 3 months before and after March 1, 2020.

\*MacNemar's test comparing the rate of caregivers who expressed moderate or extreme concerns about the resident's mental health in the 3 months before versus after March 1, 2020.

## Discussion

This study examined caregiver concerns about assisted living residents' depressed mood, loneliness and anxiety, and associated factors in the 3 months after the start of the COVID-19 pandemic (March 1, 2020) in Canada. We found high levels of caregiver concerns about residents' depressed mood (23%), loneliness (29%), and anxiety (24%) in the 3 months before the start of the pandemic, and these doubled to 50%, 62%, and 47%, respectively, in the 3 months after. Modifiable factors, including residents' access to counseling services and keeping caregivers informed about and involved in resident care, reduced caregivers' risk for concerns. Caregivers who attended to the resident's mental health needs before and/or after the start of the pandemic were more likely to express concerns than those not involved in such activities. Caregivers who learned that the resident

was tested for COVID-19 and those who identified as women were more likely to be concerned about residents' depressed mood. Non-White caregivers reported more concerns about residents' depressed mood and anxiety than white caregivers.

Two other studies focusing on assisted living assessed caregiver concerns about resident care during the COVID-19 pandemic. Semi-structured interviews with 32 caregivers of older adults (including five caregivers of assisted living residents) in Alberta, Canada, suggested that caregivers were generally more concerned about the resident's situation than about their own (Parmar et al., 2021). They raised concerns about residents' emotional, social, and physical care needs, but the study focused on the support needs of caregivers and did not discuss caregiver concerns about the resident in more detail. A U.S. study (Nash et al., 2021) surveyed 512 caregivers of nursing home and assisted living residents but did not

**Table 4.** Unadjusted and Adjusted Associations (Risk Ratios [95% Confidence Intervals]) of Caregiver-Reported Communication and Support by Assisted Living Homes, Caregiver Involvement in the Resident's Mental Health Care, and Caregiver Characteristics With Caregiver Concerns About Resident Mental Health.

Independent variables	Caregiver concern about resident's . . .					
	Depressive mood		Loneliness		Anxiety	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Resident access to counseling (ref.: Had access)						
Had no access	1.54 [1.24; 1.92]	1.42 [1.12; 1.80]	1.60 [1.32; 1.94]	1.43 [1.16; 1.77]	1.52 [1.21; 1.90]	1.40 [1.10; 1.78]
Don't know/prefer not to answer	1.02 [0.80; 1.29]	1.03 [0.81; 1.31]	1.22 [1.00; 1.50]	1.16 [0.94; 1.43]	0.94 [0.73; 1.21]	0.98 [0.76; 1.25]
Outbreak among staff (ref.: No outbreak)						
Not informed	1.41 [1.17; 1.72]	1.22 [0.93; 1.61]	1.35 [1.17; 1.56]	1.15 [0.90; 1.47]	1.46 [1.19; 1.80]	1.07 [0.83; 1.39]
Informed	1.11 [0.93; 1.32]	0.99 [0.81; 1.20]	1.07 [0.93; 1.23]	1.07 [0.92; 1.25]	1.20 [1.00; 1.44]	1.17 [0.94; 1.44]
Information about resident's COVID-19 test (ref.: No test)						
Neither test nor results	1.57 [1.29; 1.91]	1.34 [1.01; 1.77]	1.40 [1.21; 1.61]	1.20 [0.95; 1.52]	1.43 [1.16; 1.77]	1.08 [0.82; 1.43]
Test, not result	1.47 [1.20; 1.81]	1.29 [1.04; 1.61]	1.28 [1.09; 1.51]	1.11 [0.92; 1.34]	1.35 [1.08; 1.69]	1.05 [0.84; 1.33]
Test and result	1.13 [0.92; 1.39]	1.27 [1.02; 1.58]	1.00 [0.85; 1.18]	1.06 [0.88; 1.28]	1.04 [0.83; 1.29]	1.02 [0.81; 1.28]
Feeling well informed/involved	0.66 [0.57; 0.76]	0.85 [0.71; 1.01]	0.68 [0.61; 0.76]	0.82 [0.71; 0.94]	0.62 [0.53; 0.72]	0.78 [0.64; 0.94]
Attending to resident's mental health needs (pre/post March 1, 2020) (ref.: No involvement)						
Pre, not post	1.85 [1.49; 2.31]	1.79 [1.38; 2.32]	1.42 [1.19; 1.68]	1.35 [1.11; 1.66]	1.89 [1.48; 2.41]	2.07 [1.55; 2.75]
Pre/post or post only	1.90 [1.60; 2.27]	1.83 [1.49; 2.24]	1.44 [1.26; 1.65]	1.44 [1.24; 1.67]	2.05 [1.70; 2.48]	2.14 [1.71; 2.68]
Relationship to resident (ref.: other)						
Son/daughter	0.95 [0.76; 1.18]	1.01 [0.81; 1.27]	0.96 [0.82; 1.13]	1.01 [0.86; 1.19]	0.99 [0.78; 1.25]	0.98 [0.77; 1.25]
Parent/sibling/spouse	0.97 [0.72; 1.30]	1.16 [0.84; 1.61]	0.74 [0.57; 0.98]	0.95 [0.72; 1.27]	0.96 [0.69; 1.32]	1.07 [0.75; 1.51]
Caregiver identified as woman	1.34 [1.08; 1.66]	1.26 [1.01; 1.58]	1.22 [1.04; 1.44]	1.08 [0.91; 1.28]	1.25 [1.01; 1.55]	1.08 [0.86; 1.34]
Age (ref.: <55 years)						
55–64 years	0.84 [0.70; 1.01]	0.88 [0.70; 1.11]	0.96 [0.83; 1.11]	0.99 [0.82; 1.18]	0.95 [0.77; 1.17]	1.02 [0.81; 1.29]
65+ years	0.74 [0.60; 0.90]	0.81 [0.63; 1.04]	0.77 [0.65; 0.90]	0.83 [0.68; 1.01]	0.81 [0.65; 1.01]	0.93 [0.73; 1.18]
Married	0.93 [0.77; 1.12]	0.90 [0.72; 1.13]	0.95 [0.82; 1.11]	0.93 [0.77; 1.11]	0.96 [0.78; 1.19]	0.98 [0.78; 1.23]
Concerned about changes in income	1.45 [1.19; 1.77]	1.10 [0.79; 1.51]	1.25 [1.06; 1.48]	1.05 [0.82; 1.35]	1.55 [1.27; 1.90]	1.20 [0.94; 1.53]
Education (ref.: High school or less)						
College/trade	1.09 [0.89; 1.33]	0.98 [0.80; 1.21]	1.07 [0.91; 1.25]	1.07 [0.90; 1.26]	1.08 [0.88; 1.33]	0.95 [0.77; 1.17]
Academic	1.19 [0.97; 1.46]	1.06 [0.86; 1.31]	1.17 [1.00; 1.38]	1.12 [0.94; 1.33]	1.07 [0.86; 1.34]	0.93 [0.75; 1.16]
Race/ethnicity other than white	1.27 [1.03; 1.56]	1.31 [1.00; 1.71]	1.03 [0.84; 1.25]	1.07 [0.83; 1.39]	1.28 [1.02; 1.60]	1.32 [1.01; 1.71]

report results by care setting. Almost half of the participants expressed concerns about the residents' isolation, 40% about rapid decline (open text responses mostly referring to emotional decline), and 30% about inhumane care (Nash et al., 2021). Rates of caregiver concerns reported in nursing homes are similar. In a U.S. study (Jun 2020 to Aug 2021; Mitchell et al., 2021), 30% of the 125 caregivers were concerned about the resident's social isolation and 26% about deteriorating mental, physical, or cognitive health. In a Taiwanese study (April 2020; Yeh et al., 2020), 38% of the 156 caregivers were concerned about the resident's psychological stress. Caregivers in a Dutch study ( $n = 1,997$ , April to May 2020; Wammes et al., 2020) reported concerns about residents' increased loneliness (76%), sadness (66%), and decreased quality of life (62%). These high rates of caregiver concerns about resident mental health in both, AL and nursing home settings, point to the need to develop public health measures that (a) better balance residents' mental health needs with safety concerns and (b) ensure continued inclusion of caregivers in resident care (Dys et al., 2021; Hindmarch et al., 2021; Mitchell et al., 2021; Nash et al., 2021; Parmar et al., 2021; Prins et al., 2021; Wammes et al., 2020).

A Dutch study surveyed 958 caregivers of nursing home residents between April and May 2020 and measured the level of caregiver worries using a 9-item scale ranging from 0 (*never worried*) to 5 (*almost always worried*; Prins et al., 2021). Similar to our study, the authors found that caregivers with greater involvement before the pandemic were more worried during the pandemic. The authors also found that at least minimal weekly contact during the pandemic decreased caregivers' worries. However, unlike our study, this study focused on worries in general and did not assess specific areas of caregiver concerns.

In line with other studies—prior to (Harper et al., 2021), as well as during the COVID-19 pandemic (Hindmarch et al., 2021; Mitchell et al., 2021; O'Caomh et al., 2020; Wammes et al., 2020)—we found that caregivers often judged communication by the AL home as sub-optimal. However, our study is the first to assess the association of specific communication topics related to COVID-19 in AL with caregiver concerns about resident mental health. Being informed about outbreaks among residents or care staff was not associated with caregiver concerns about resident mental health. However, caregivers were 30% more likely to be concerned about the resident's depressed mood if their resident was tested for COVID-19. This focus on the specific resident experience is supported by the finding that feeling well-informed about and involved in the care of the resident decreased the likelihood of caregiver concerns about residents' loneliness and anxiety by about 20%. We also found that caregivers' perception that residents did not have access to counseling services increased the risk of concerns about resident mental health by 40%. Access to mental health services for AL and nursing home residents was poor even before the pandemic and deteriorated further due to the

lockdown measures (Flint et al., 2020; Perlman et al., 2019). This is concerning, given the higher prevalence of dementia, depression, and anxiety among older adults living in congregate, compared with community settings (Seitz et al., 2010). In addition to infection prevention, future public health measures must ensure AL and nursing home residents' continued access to mental health services.

### **Strengths and Limitations**

Research on the impact of COVID-19 on caregivers of AL residents is emerging but limited by the lack of robust, quantitative studies applying advanced statistical modeling approaches. Previous studies often excluded caregivers of assisted living residents (Hindmarch et al., 2021; Mitchell et al., 2021; O'Caomh et al., 2020; Prins et al., 2021; Wammes et al., 2020; Yeh et al., 2020), only included small samples of assisted living caregivers (Anderson et al., 2021; Parmar et al., 2021), and/or did not report subgroup analyses (Nash et al., 2021). Our study is one of the few to address this important research gap. Other strengths of our study include the use of a validated survey with a large sample of caregivers of assisted living residents in 2 Canadian provinces. The cross-sectional design of our study is a limitation, not allowing temporal precedence of outcomes, which prevents causal conclusions. The generalizability of our results is limited as most participants were White, spoke English as the primary language, and had relatively high household incomes. The nature and amount of caregiver concerns may differ in equity-seeking groups. Our study found that non-White caregivers were more likely to express concerns about residents' depressed mood and anxiety. However, as our study did not include resident data, we cannot assess whether these differences were due to inequities among residents, cultural differences in caregiver perceptions, or both. Generally, the lack of resident data limits our ability to further contextualize the caregiver perceptions. For example, from our previous studies in AL in Alberta (Strain et al., 2011; Wanless et al., 2011), we know that 71% of the residents were widowed, 8% were divorced and 6% were never married. In that study, 78% of the homes had private rooms only, 31% had spousal suites (range from one to 10 suites per home), and only few of these were used by spouses. This suggests that most assisted living residents live alone and that support from caregivers may be critical as residents' social contacts within the home are limited. However, due to the pandemic conditions and restrictions, we were not able (and permitted as per our ethics approvals) to obtain resident data that would have helped to investigate these issues.

### **Conclusion**

Caregivers of assisted living residents are at high risk of experiencing moderate to extreme concerns about residents' depressed mood, loneliness, and anxiety. Caregiver concerns

are important indicators of unmet resident care needs, and they put caregivers at risk of poor mental health. The pandemic substantially increased caregivers' concerns about resident's mental health. We found that modifiable factors that can be influenced by nurses, including continued resident access to counseling, and keeping caregivers informed about and involved in resident care reduced the risk of caregiver concerns. Facility-level factors (outbreaks among care staff and residents in general, and information about infection control measures and visitor restrictions) were less relevant for caregivers' concerns than the individual resident's situation. Public health policies, AL settings, and nurses working in these settings need to ensure continued resident access to mental health services, and caregivers' continued access to information and involvement in resident care. AL settings and nurses working in these settings need to be aware of the relevance, types and amount, and factors associated with caregiver concerns about residents. This can help prevent or mitigate unmet resident care needs and caregiver mental health issues.

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