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Factors associated with loneliness in Latin-American family care partners during the COVID-19 pandemic

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Background: COVID-19-related restrictions led to an increase in overall loneliness and social isolation. Before the pandemic, care partners reported higher levels of loneliness and higher loneliness prevalence compared to non-care partners. Because of the spread and severity of the infections, and the access to support spread, we expect a different impact of the COVID-19 pandemic on LATAM care partners.

Objectives: To describe the loneliness levels of LATAM caregivers and to identify socioeconomic and health factors associated.

Design: An international online cross-sectional survey for care partners, embedded within the 'Coping with Loneliness and Isolation during COVID-19' (CLIC) Study conducted between June 2020– and November 2020.

Setting: We analysed data from 246 family care partners living in Latin American countries (46% Mexico, 26% Chile, 18% Brazil, and 10% from Argentina, Peru, Venezuela, Panama, Guatemala y Costa Rica).

Measurements: We assessed loneliness using the 6-items of De Jong Gierveld loneliness Scale. We described the levels of overall, emotional, and social loneliness pre and during Covid, and reported the distribution of care partners who improved, worsened or maintained their levels of loneliness. Moreover, we used longitudinal multiple linear regression models with bootstraps errors of 1,000 iterations to identify factors associated with the levels of overall, emotional, and social loneliness during the pandemic.

Results: Participants were mostly women, 50 years and older, in a partnership, highly educated and with finances meeting their needs, with good to excellent physical and mental health. Among the total of care partners, 55% perceived higher overall loneliness, 56% higher emotional loneliness, and 21% higher social loneliness during the pandemic in comparison with pre-COVID-19 levels. Perceived mental health was associated with the overall, emotional, and social loneliness.

Conclusions: Regardless of their living and health situation, during the pandemic, loneliness increased in all groups of care partners. These should be taken in consideration when planning public health approaches for crises such as pandemics or other large-scale disruptive events.

KEYWORDS

loneliness, family care partners, Latin America, COVID - 19, family caregivers

Introduction

Loneliness is often described as an unpleasant feeling that comes from the desire for a different social life or closer connections (1, 2). Weiss (3) identified two components of loneliness: emotional and social loneliness. Emotional loneliness is associated with the perceived absence or loss of an intimate connection, while social loneliness arises from a perceived lack of a social network (4–9). Research often focuses on overall loneliness (5, 10). Chronic loneliness, characterized by a high frequency and intensity, can have serious health consequences, including sleep disorders, depression, heart disease, dementia, and ultimately reduced life expectancy (10–12).

Loneliness is a steady feature with individual differences, which means, there are people more susceptible to feeling lonely during their lifespan. In the general population, people most at risk of loneliness are women, young adults or the oldest (80 + years), with a low level of education, low household income, living alone, experiencing pain, or living with a disease (10). However, specific individual or contextual factors can also trigger an increase in loneliness levels even for those with a low tendency for loneliness.

Globally, the COVID-19 (SARS-CoV-2) pandemic presented a significant public health challenge (13). Between 2020 and 2021, to

curb the spread of COVID-19, many governments implemented various public health measures such as physical distancing, community lockdowns, closures of schools, workplaces, and public facilities, restrictions on large gatherings, and reduced use of public transport (14). Due to the long periods of confinement and physical restrictions, there was a growing concern about the health impact of social isolation and loneliness (15). At the start of the physical distancing measures, reports of loneliness in the general population significantly increased compared to pre-pandemic levels (16–19). For instance, the Coping with Loneliness, Isolation and COVID-19 (CLIC study) for the general population, from where the present study collected information, reported that among the 20,000 participants from over 100 countries, the prevalence of severe loneliness in adults 18 years old and older went from 6% before the pandemic to 21% during Covid-19 (15). Another study conducted in Japan reported that loneliness increased among younger and older adults, but the change was more intense and detrimental among younger adults (20). Finally, in the UK, four classes of loneliness trajectories were described, with levels of loneliness ranging from low to high at baseline. In the group with the highest levels, loneliness increased during the first year of the pandemic, while it decreased in the group with the lowest levels (16). Women, younger adults, with low income and economically

inactive, or with mental health conditions were more likely to be in the highest-level loneliness group (16).

Before the pandemic, care partners reported higher levels of loneliness and lack of social support compared to non-care partners (21–24). However, findings have been inconsistent (23). During the pandemic, English-speaking caregivers experienced an increase in general, emotional and social loneliness and social isolation compared to pre-pandemic levels (25, 26). Moreover, most care partners of people with intellectual disability experienced the highest emotional and social loneliness during the pandemic (26). In the US, in a subsequential mixed method study, out of 82 care partners in Utah, 76.7% reported feelings of loneliness during the pandemic, and 21.9% mentioned they felt lonely every day. The care partners stated that their burden increased because they were their care recipient's single social interaction and had to permanently provide support to their social needs (27).

The COVID-19 pandemic impacted Latin America (LATAM) especially hard, at one point, up to 25% of the global infections occurred in the region (28). During the first wave, eight of the ten countries with higher mortality were from LATAM (28). Because of their living conditions and the accessibility to services, it is expected that the impact on loneliness may differ from other regions (28, 29). Yet, data from LATAM, a region comprising nearly 9% of the world's population, have not been reported.

There are several knowledge gaps regarding the impact of the pandemic on loneliness in LATAM care partners. In consequence, the aims of this study were 1) to describe the mean level of overall, emotional and social loneliness among LATAM care partners during the COVID-19 pandemic, and 2) to identify sociodemographic risk factors for loneliness mean levels during the COVID-19 pandemic.

Methods

Study design

This was a cross-sectional study embedded within the 'Coping with Loneliness, Isolation and COVID-19' (CLIC) project, an international online self-administered survey, conducted between June 2nd, 2020– and November 16th, 2020. CLIC aimed to analyse the changes in loneliness and social isolation during the COVID-19 pandemic among adults 18 years globally. The survey was developed through consensus by the International Loneliness and Isolation Research Network (I-LINK), and it is described elsewhere (15). The CLIC study was approved by the Ethics Committee of Ulster University (RG3) on 15th May 2020. Additional ethical approval was obtained in each country when the local regulation required it. All participants gave informed consent.

The survey's recruitment was coordinated by a nominated investigator for each participating country, who accessed potential participants through the email lists and websites of public or voluntary sector organizations supporting family or informal care partners of people with brain health conditions and snowballed the survey link through social media networks such as Facebook and Twitter. To maximize uptake, each investigator distributed the

survey at least twice during the data collection period, with a minimum of four weeks between distributions. Participants were internet users, and aged eighteen and older. Given that the participants were volunteers recruited online, we acknowledge a representation issue in this sample. At the same time, very few studies have reported the loneliness levels among care partners living at countries in LATAM.

Study participants

Within the CLIC survey, the CLIC-Global Care Partners Sub-Study included 5,236 participants who self-classified as informal care partners (also called family caregivers meaning those who give care to family or friends usually without payment) of people with enduring physical (n=3,234) or brain health-related conditions (n=2,379 dementia; n=855 mental ill-health). Most of the care partner respondents were from USA and Canada (45%) and Europe (33%).

Participants who self-identified as care partners residing in LATAM (n=320; 7% out of the total care partners sample) were considered for the current study. Of them, 55 (17% of the initial sample) were excluded because they had missed three or more items about social and emotional loneliness. Additionally, 24 participants (7.5%) were excluded because of missing data in the covariates. Out of the final sample of 246 caregivers, 68 (27.64%) cared for PLWD and 175 (71.14%) cared for people with other enduring conditions, 3 care partners (1.22%) did not disclose the condition of the care recipient but were included in the analysis because of the availability of sociodemographic and loneliness information. In addition, 46% were care partners from Mexico, 26% from Chile and 18% from Brazil (see Figure 1). See the complete list of countries in the Supplementary Materials Table S1.

Study variables

The online survey encompassed 129 questions, including sociodemographic factors, measures of care partners' burden, loneliness, social isolation, and general health, relating to their status pre and during the COVID-19 pandemic. Information from pre-COVID-19 used as baseline was retrospectively collected by asking the participants to remember the status of their physical and mental health, loneliness, and social isolation.

Measurements

Outcomes: overall, emotional, and social loneliness

The questionnaire included R-UCLA loneliness items and the De Jong Gierveld Scale. Because National Surveys of Ageing measure loneliness using items from the UCLA Loneliness Scale, we selected it to report overall loneliness to allow comparability. Emotional and social loneliness were measured using the De Jong Gierveld Loneliness Scale. Loneliness was measured twice in the questionnaire. At the beginning, participants answered about their

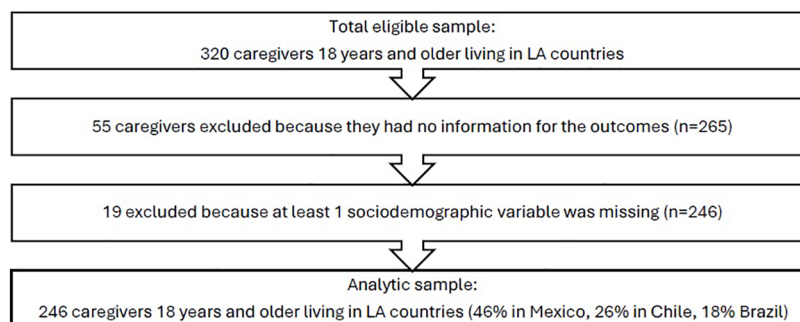


FIGURE 1
Study flowchart.

pre-COVID-19 loneliness, and at the end, they answered about their current levels of loneliness (during COVID-19). We reported both measurements but only modelled during COVID-19 loneliness due to the risk of recall-biased results in the pre-COVID-19 measurement.

Overall loneliness

Loneliness was assessed using the revised 3-item UCLA loneliness scale (30). The three items ask how often people feel “left out”, “lack of companionship” and “isolated”. The response scale was from hardly ever (1), some of the time (2), and often (3), providing a total score between 3 and 9 with higher scores denoting a higher level of loneliness.

Emotional and social loneliness

Emotional and social loneliness were measured using the 6-items version of the De Jong Gierveld Scale (5). The three items that measured emotional loneliness were ‘emptiness’, ‘miss people around’, and ‘rejected’, while the three items that measured social loneliness were ‘plenty I can rely on’, ‘many people I trust’, and ‘enough people I feel close to’. The total scores for both subscales ranged from 0 to 3, where 0 represents the least lonely and 3 represents the loneliest participants.

Independent variables

Sociodemographic and health characteristics

Based on the original CLIC study (15) and the factors previously described in association with loneliness (10, 31) we selected potential risk and protective factors for the study. We used self-classified binary gender (men or women). A small number of participants chose the “other” or “prefer not to say” options, so they were recoded as missing because of power analysis considerations. Age was measured in 13 groups in the questionnaire (18-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-99). However, considering the sample size of our study and distribution, we used age in five groups (a) 18-34, (b) 35-44, (c) 45-54, (d) 55-69, (e) 70 and over). Marital status referring to people legally married or in

relationships was categorised in two groups 1 “married/with partner/cohabiting” and 0 “never/not currently”. Education was measured using four categories “elementary” “diploma” “degree” and “postgraduate” studies. Considering the number of observations within all the categories (7% elementary, 5% diploma, 31% degree, and 56% postgraduate), we recoded the variable into two groups “postgraduate studies” and “less than postgraduate studies”. Participants were also asked about their living situations. We created the variable living alone where 1 refers to people living alone and 0 people living with others (partners, family, or friends). Among the 320 LATAM care partners included in the initial analytic sample, only 6 of them self-classified as living in rural areas. Because of the lack of observations, the variable was not included in the multiple regression analysis.

Classification of family care partners

Participants selected the diagnosis of their care recipients from four categories: care partners of people living with dementia (PLWD), mental health problems, intellectual disabilities, chronic physical disabilities, other disabilities, or dual disability issues. Because of the sample and the mental health issues largely described for caregivers of PLWD, the variable was also recoded into two groups, care partners of PLWD and non-dementia care partners. Additionally, we used the type of kin relationship within the care dyads classified into three groups: spouses (1), family members (2), and non-relatives (3).

Social isolation

Social isolation changes were measured by modifying the response scale of the six-item Lubben Social Network Scale (LSNS-6) (15). The LSNS-6 includes three items about family contacts and three items about contact with friends. To assess the changes from pre to during the pandemic, the participants answered if isolation was “about the same” (0), “more than usual” (+1), or “less than usual” (−1). We created the categorical variable “worse social isolation” where 1) was “worse social isolation” encompassing those who answered, “more than usual” and 0) “as usual or better social isolation” including the participants who used the options “less than usual” or “about the same”.

Perceived physical and mental health

The participants self-rated their physical and mental health as poor to excellent. We recodified their answers as binary dummy variables. Responses of “excellent”, “very good” or “good” were categorized as 1 “Good Ph/M health” and fair or poor as 0 “Poor to fair Ph/M health”.

Care partners’ burden

Burden was measured using the question “How often do you feel burdened by the caring role?”. The participants answered in a scale of five categories: 1) “never”, 2) “rarely”, 3) “sometimes”, 4) “quite frequently”, and 5) “nearly always”. Considering the number of observation available, we added burden as an ordinal variable into the models, where closer the scores to five, higher level of burden.

Statistical analysis

Descriptive analysis

We described the sociodemographic and health characteristics by gender using Chi2 and Kruskal Wallis analysis. Moreover, we described the levels of overall, emotional, and social loneliness, the number of care partners with the same level of loneliness before and during the pandemic, and the percentage of them who increased or decreased their levels.

Association analysis

First, we tested different exposures and covariates using single regression models (see [Supplementary Tables S2-S4](#) in the [Supplementary Material](#)). The covariates “gender”, “age” and “social isolation” of the care partners were included regardless of the significance level in the bivariate analysis, while for the rest, only those with a p-value < 0.05 at least in the follow-up were included in the final model.

We used the mean level of overall, emotional, and social loneliness during COVID-19 and performed a multiple linear regression using the STATA command “reg”. Given that loneliness scales (overall emotional, and social loneliness) produced a non-normally distributed discrete variable (see [Supplementary Figure S1](#) in the [Supplementary Materials](#)), we used bootstrap errors with 1000 iterations to estimate more precise confidence intervals. We chose the final models by balancing the goodness of fit (AIC) and the adjusted total percentage of variance explained (R2). The variables type of care partners (two or six groups), kin relationships, alcohol consumption, smoking, sleeping hours, anyone who died during Covid, Covid-related deaths, hospitalisation due to Covid, and physical perceived health were only associated in the bivariate analysis; therefore, not included in the models.

We determined factors associated with the caregiver’s overall loneliness levels during the pandemic ([Equation 1](#)), the caregiver’s emotional loneliness during the pandemic ([Equation 2](#)), and the caregiver’s social loneliness during the pandemic ([Equation 3](#)). We used conventional levels to consider a statistically significant association with a p-value lower than 0.05 and confidence intervals without the null value.

$$Y_1 = \beta_0 + \beta_1 * \% > Age (\%)_i + \beta_2 * \% Women_i + \beta_3 * \% people\ with\ postgraduate\ education_i + \beta_5 * Burden_i + \beta_5 * perceived\ mental\ health_i + \beta_6 * \Delta social\ isolation_i + \mu_c \quad (1)$$

$$Y_I = \beta_0 + \beta_1 * Age (\%)_i + \beta_2 * \% Women_i + \beta_3 * \% fairly\ well\ finances_i + \beta_4 * \% poorly\ finances_i + \beta_5 * \Delta mental\ health_i + \beta_6 * \Delta social\ isolation_i + \mu_c \quad (2)$$

$$Y_1 = \beta_0 + \beta_1 * Age (\%)_i + \beta_2 * \% Women_i + \beta_3 * \% people\ with\ postgraduate\ education_i + \beta_4 * Burden_i + \beta_5 * \% good/excelente\ physical\ health_i + \beta_6 * \% good/excelente\ mental\ health_i + \beta_7 * \Delta social\ isolation_i + \mu_c \quad (3)$$

Y refers to the overall loneliness, emotional or social loneliness, respectively; and “i” refers to variables measured at the individual level. Cross-sectional linear regression models were used. Δ stands for variation between the period pre-COVID and during COVID.

Results

Care partners’ sociodemographic and health characteristics

Latin American family care partners were mainly women (79%), highly educated (44% had a degree and 56% had a postgraduate degree) and with finances that met their needs very to fairly well (88%), caring for a relative other than their spouse (87%) with disability due to dementia (22.22%), a physical illness (27.16%) or other conditions (23.87%). Eight percent of the care partners reported their care recipients having two different diagnosis. Men participants age was between 18 and 74 years, while women were up to 99 years old (see [Supplementary Materials, Supplementary Figure S2](#)). The age groups were recodified using five groups (the majority of the participants were fifty years and older (55%)) ([Table 1](#)).

Most of the participants had an excellent to good physical and mental health and reported similar or better social isolation during the COVID-19 pandemic than before the pandemic. Men and women differed in their alcohol and smoking consumption, as well as the changes in their social isolation and the burden due to caring role ([Table 2](#)).

Levels of overall, emotional, and social loneliness and their self-perceived changes

[Table 3](#) depicts the levels of total, emotional, and social loneliness pre and during the COVID-19 pandemic and the distribution of the changes between measurements. During the

pandemic, there was an increase in the loneliness mean levels of overall, emotional, and social loneliness. Accordingly, 55% of the care partners reported higher levels of overall loneliness during the pandemic while 56% of them reported higher levels of emotional loneliness. Surprisingly, 70% of the care partners reported the same level of social loneliness before and during the pandemic, while 21%

perceived they had a higher level of social loneliness. There were no differences between care partners of PLWD and other health conditions. Based on Pearson correlations, pre and during COVID overall, and emotional loneliness had a moderate association ($r=0.37$, $r=0.28$, respectively), while the pre and during social loneliness had a high association ($r=0.60$).

TABLE 1 Socioeconomic characteristics of the participants.

	Men (21.14%)		Women (78.86%)		Total		p-value
	n	%	n	%	n	%	
Age							
18-34	12	23.08	30	15.46	42	17.07	0.280
35-44	5	9.62	36	18.56	41	16.67	
45-54	12	23.08	57	29.38	69	28.05	
55-69	21	40.38	61	31.44	82	33.33	
70+	2	3.85	10	5.15	12	4.88	
Marital status							
Never/not currently	22	42.31	82	42.27	104	42.28	0.996
Married/current partner/cohabiting	30	57.69	112	57.73	142	57.72	
Educational level							
Postgraduate	24	46.15	113	58.25	137	55.69	0.119
Other educational level	28	53.85	81	41.75	109	44.31	
Finances meet needs							
Very well	14	26.92	68	35.05	82	33.33	0.532
Fairly well	26	50	84	43.3	110	44.72	
Poorly	12	23.08	42	21.65	54	21.95	
Location							
City	44	86.27	181	93.3	225	91.84	0.090
Town	5	9.8	12	6.19	17	6.94	
Rural	2	3.92	1	0.52	3	1.22	
Kin relationship							
Spouse	3	5.77	23	11.86	26	10.57	0.384
Family relative	48	92.31	165	85.05	212	86.59	
Non-relative	1	1.92	6	3.09	7	2.85	
Diagnose of the care recipient							
Dementia	11	21.15	43	22.51	54	22.22	0.510
Physical issues	16	76.92	50	26.18	66	27.16	
Mental Health issues	5	9.62	29	15.18	34	13.99	
Intellectual issues	5	9.62	6	3.14	11	4.53	
Others	11	21.15	47	24.61	58	23.87	
Dual	4	7.69	16	8.38	20	8.23	

p-values came from linear regression models and Chi2 tests.

TABLE 2 Health characteristics of the participants.

	Men (21.14%)		Women (78.86%)		Total		
	n	%	n	%	n	%	
Someone died during the pandemic							
No	34	65.38	131	67.53	165	69.07	0.770
Yes	18	34.62	63	32.47	81	32.93	
Alcohol consumption							
Less than before	12	23.08	30	15.46	42	17.07	0.022
More than before	2	3.85	19	9.79	21	8.54	
About the same	20	38.46	44	22.68	64	26.02	
Don't partake	18	34.62	101	52.06	119	48.37	
Smoking consumption							
Less than before	2	3.85	3	1.55	5	2.04	0.001
More than before	2	3.85	10	5.18	12	4.90	
About the same	9	17.31	4	2.07	13	5.31	
Don't partake	39	75	176	91.19	215	87.76	
Sleeping hours							
Less than before	6	11.54	10	5.15	16	6.50	0.168
More than before	21	40.38	98	50.52	119	48.37	
About the same	25	48.08	86	44.33	111	45.12	
Perceived physical health							
Excellent/very good/good	45	86.54	155	79.9	200	81.30	0.275
Fair/poor	7	13.46	39	20.1	46	18.70	
Perceived mental health							
Excellent/very good/good	45	86.54	165	85.05	210	85.37	0.788
Fair/poor	7	13.46	29	14.95	36	14.63	
Δ Social isolation							
Better or equal	45	86.54	142	73.2	187	76.02	0.045
Worse	7	13.46	52	26.8	59	23.98	
Burden by caring role							
Never/rarely/sometimes	42	80.77	118	60.82	160	65.04	0.007
Frequently/Always	10	19.23	76	39.18	86	34.96	

p-values came from linear regression models and Chi2 tests.

Factors associated with total, emotional, and social loneliness among Latin American family care partners during the COVID-19 pandemic

Table 4 displays the results of the multiple linear regression models for the mean level of overall, emotional, and social loneliness during the pandemic.

The final model for overall loneliness during the pandemic considered age, gender, educational level, burden, perceived mental health, and the changes in social isolation. The factors accounted for

14% of the adjusted variance. Worse social isolation during the pandemic (β coef. = 0.850; 95% CI: 0.348, 1.351), frequent feelings of burden because of care duties (β coef. = 0.919; 95% CI: 0.451, 1.388), and poor mental health (β coef. = 0.719; 95% CI: 0.045, 1.394) were associated with higher overall loneliness during the pandemic. Marital Status and Kin relationship were also associated with loneliness in the bivariate analysis but excluded from the multilevel models due to their low contribution to the Goodness of fit. Visual analysis of the residuals showed an adequate goodness of fit for the model (see [Supplementary Materials](#), [Supplementary Figure S3](#)).

TABLE 3 levels of overall, emotional, and social loneliness and their changes during the pandemic.

	Before the pandemic	During the pandemic
Overall loneliness (mean(sd))	4.06 (1.33)***	5.16 (1.84)***
Emotional loneliness (mean(sd))	0.84 (0.99)***	1.66 (0.98)***
Social loneliness (mean(sd))	1.93 (1.32)***	2.20 (1.23)***
Δ Overall loneliness	Freq.	%
The same	73	29.67
Higher loneliness	135	54.88
Lower loneliness	38	15.45
Δ Emotional loneliness		
The same	84	34.15
Higher loneliness	137	55.69
Lower loneliness	25	10.16
Δ Social loneliness		
The same	173	70.33
Higher loneliness	52	21.14
Lower loneliness	21	8.54

Δ stands for changes between measurements. The same is the % of people that perceived the same mean levels of loneliness. Higher loneliness is the % of people who perceived an increment in their mean levels during the pandemic. Lower loneliness is the % of people who perceived a decrease in their mean levels during the pandemic. *** $p < 0.001$.

The final model for emotional loneliness encompassed age, gender, whether finances met needs, perceived mental health, and the change in social isolation. It explained 13% of the emotional loneliness variance. According to conventional levels, finances poorly meeting participant's needs was associated with higher levels of emotional loneliness (β coef. = 0.428; 95% CI: 0.097, 0.759). Similarly, family care partners who perceived a poor mental health (β coef. = 0.454; 95% CI: 0.145, 0.764) and had worse social isolation during the pandemic reported higher emotional loneliness (β coef. = 0.515; 95% CI: 0.267, 0.764). Finally, care partners who were between 35 and 44 years old had lower levels of emotional loneliness compared to those 18-34 (β coef. = -0.422; 95% CI: -0.839, -0.005).

Interestingly, age, gender, educational level, burden, perceived physical and mental health and the changes in social isolation accounted for only 5% of the total variance of social isolation during the pandemic. Participants with less than postgraduate education (β coef. = 0.490; 95% CI: 0.182, 0.799) had higher levels of social loneliness than those with postgraduate education.

Discussion

To our knowledge, this is the first study exploring the levels of overall, emotional, and social loneliness during the COVID-19 pandemic among care partners of people with chronic conditions living in LATAM. Care partners in this study were primarily

women 50 years and older, in a partnership, highly educated and with finances meeting their needs. They were caring for a non-spouse family member with a physical, mental, or cognitive disability other than dementia.

Our study found that care partners experienced higher levels of overall, emotional, and social loneliness during the COVID-19 pandemic. We call upon interpreting the pre-COVID loneliness levels with caution due to potential recall bias. Nevertheless, our results confirm what was observed in the general sample of the CLIC Global Care Partners Study (25, 26) and other studies conducted among the general population (25, 32)—showing higher levels of loneliness during the pandemic and no differences by region. Given that loneliness is considered a risk factor for depression (33, 34), these findings should raise concern about the mental health of care partners even during the post-social restrictive measures' time. The mental health consequences might remain, especially if countries face a humanitarian crisis after the COVID-19 emergency (35).

Very few studies have described the levels of loneliness among family care partners of PLWD (21, 36), and other family care partners (37). Although in general, care partners of people living with dementia (PLWD) have shown worse mental health, including loneliness and burden, than care partners of people with other chronic conditions (38), in our study, the overall, emotional, and social loneliness did not differ between care partner of PLWD and other conditions. The recently published report of the CLIC Global Care Partners Study ($n=3,930$), where care partners of PLWD were one of the groups compared, found that the most affected groups of care partners were those taking care of relatives with intellectual disability and dual conditions (26). LATAM countries have been improving their health and social care systems to provide universal care and support people living in socially deprived conditions. However, it varies by country. Some LATAM countries are low-income, with a low public expenditure, and an important health gap, including a lack of hospital beds, and specialists (14). Additionally, as in the rest of the world, public and private systems were highly impacted by the pandemic, affecting usual care. All these factors might have decreased the level of support that people living with any long-term physical, cognitive, or mental health conditions received, indirectly affecting care partners' mental health regardless of the care recipient's diagnosis or condition (35).

Perceived mental health was associated with overall, and emotional loneliness. The protective role of a positive perception of mental health has been described for loneliness and other health outcomes (11, 39, 40). Moreover, even though, we did not report depressive symptoms or other mental health conditions, our results might reflect the previously described link between stress, anxiety, depression, and loneliness (31, 33, 41, 42).

The experience of burden due to care tasks was associated with overall loneliness. Previously, a study in Singapore reported that care partners moderately connected but lonely reported higher levels of burden (43). Noteworthy, the analysis of the English-speaker CLIC participants showed an increased burden among participants with severe emotional loneliness.

Educational level was the only factor associated with social loneliness regardless of age, gender, self-reported physical and mental

TABLE 4 multiple linear regression models for overall, emotional, and social loneliness (n=246).

	Overall loneliness			Emotional loneliness			Social loneliness		
	β coef.	95% CI		β coef.	95% CI		β coef.	95% CI	
35-44	-0.112	-0.863	0.639	-0.422*	-0.839	-0.005	-0.054	-0.517	0.410
45-54	0.126	-0.542	0.793	-0.113	-0.469	0.242	-0.405	-0.864	0.053
55-69	0.268	-0.345	0.882	-0.014	-0.343	0.315	-0.300	-0.720	0.119
70 and over	-0.009	-1.303	1.285	-0.339	-1.028	0.350	-0.161	-0.886	0.565
Gender	0.285	-0.257	0.827	0.239	-0.057	0.536	0.174	-0.208	0.556
Educational level	0.429	-0.044	0.903				0.490**	0.182	0.799
Burden	0.919***	0.451	1.388				0.205	-0.108	0.518
Finances met needs									
Fairly well	-			0.172	-0.091	0.435	-		
Poorly	-			0.428*	0.097	0.759	-		
Physical Health				-			-0.115	-0.491	0.261
Mental health	0.719*	0.045	1.394	0.454**	0.145	0.764	0.283	-0.055	0.620
Δ social isolation	0.850***	0.348	1.351	0.515***	0.267	0.764	0.257	-0.044	0.612
Constant	4.024***	3.348	4.700	1.231***	0.831	1.632	1.919***	1.441	2.398
Model specifications									
R2	0.171			0.157			0.089		
Adjusted R2	0.139			0.125			0.051		
AIC	968.131			665.095			798.702		
Chi2 (p-value)	53.04 (<0.001)			54.33 (<0.001)			30.32 (<0.001)		

*<0.05 **<0.01 ***<0.001. Ref category for age “18 to 34”. Ref category for agender “Men”. Ref category for educational level “Less than postgraduate education”. Ref category for mental health “Good/excellent”. Ref category for burden “never to sometimes”. Ref category for finances “Very well”. Ref category for worse social isolation “less or equal social isolation”. Models were conducting using bootstrap errors. 95% CI first column depicts min value; second column depicts max values.

health, and the changes in social isolation. Even though our sample was conformed mostly of highly educated people, those with a postgraduate degree had a significantly lower level of overall loneliness. Education level has been linked to overall, emotional and social loneliness (24, 36, 44); and it has been used before as a proxy for socioeconomic status. High socioeconomic status can be associated with loneliness because it provides positive living conditions, including the possibility for social connections and leisure activities (45, 46). In our study, we also used an additional measure of economic status, asking how well care partners’ finances met their needs. The finances were only statistically significantly associated with emotional loneliness and were not included in the overall and social loneliness models. We hypothesize that people with a postgraduate degree had more skills to cope with the economic and other consequences of the pandemic, being able to switch to remote work, maintaining their salaries, and finding ways to replace their regular social interactions. On the other hand, those who had a poor financial situation might have needed more emotional support. Socioeconomic status using different proxies has been previously linked to loneliness in the general population and among care partners (24, 45, 47).

We found an association between the changes in social isolation and overall and emotional loneliness, while the changes in social isolation were not statistically significantly associated with social

loneliness. Previous studies have shown that socially isolated people can feel lonely, but not all lonely people are socially isolated (48). Theoretical models of loneliness and social exclusion have described the interplay between individuals’ needs, expectations, and their existing connections. These expectations stem from comparing one’s social connections with those of others (1, 46, 47). In a global context where social interactions were limited, emotional connections may have held greater significance than social contacts, potentially accounting for the absence of statistical association between social isolation and social loneliness. Interestingly, the dimension of physical loneliness has recently been brought to attention, considering that most restriction measures limited physical contact rather than social or emotional contact. In Germany, the first study about physical loneliness reported that its prevalence differed from the emotional and social dimensions of loneliness, and it increase during the first weeks of COVID-19 restrictions measures (49).

The present study has certain limitations. Firstly, this was a cross-sectional measure of the loneliness levels during the COVID-19 pandemic; therefore, no causal inferences can be made. Secondly, the sample size for Latin American care partners might be biasing our estimations. We used bootstrap error to obtain more precise confidence intervals. Thirdly, only 10% of our sample comes from countries other than Mexico, Chile, and Brazil (see Supplementary Table S1 published

as [Supplementary Materials](#)), so the results might have external validity issues. Fourthly, the sample analysed in this study had mostly care partners with postgraduate education which is expected in online surveys because of computer access and the required skills to use the survey platforms. Thus, our sample is not necessarily representing the reality of all Latin American care partners and our results should be interpreted with caution. Fifthly, the respondents were volunteer participants who answered an online survey, which means selection bias might be present. Sixthly, pre-COVID-19 loneliness was retrospectively measured and was potentially affected by recall bias. To overcome this issue, we only modelled the during-COVID-19 measures, as they reflect the present of the care partners at the moment of the survey. Seventhly, physical restriction measures varied not only across countries but across time in the same country, therefore the impact might vary depending on where and when the survey was answered. Finally, despite the long list of variables explored, the explained variance for all the models was very low, which is an indication of unmeasured predictor factors and potential confounders. Additionally, the models for emotional and social isolation need to be taken as an exploratory attempt to describe the factors associated. We selected the best solution for both outcomes, but the models' residuals were not normally distributed, which might indicate unmeasured variables better associated with emotional and social loneliness. There is a need for further exploration with a higher statistical power. Noteworthy, the model for overall loneliness showed an adequate goodness of fit. Finally, because of the nature of the survey, we were not able to calculate response rate and participation rates, and the missing data was up to 25%. We did not impute the data but, in order to improve the precision of the standard errors, bootstrap analyses using 1000 iterations with robust error were carried to calculate our regression models (50).

Conclusion

To our knowledge, this is the first multinational study that evaluated Latin American care partners of persons with any enduring health condition, including physical and mental diseases. The results should be considered as an exploratory approach to describe the levels of overall, emotional, and social loneliness among family care partners pre and during the pandemic of COVID-19.

The COVID-19 pandemic, and the physical restrictions implemented, impacted global society at several levels to an extent that only time will tell. An increase in loneliness was a particularly relevant effect in vulnerable populations, such as care partners of people with long-term physical, cognitive, or mental health conditions.

The increase in the levels of social and emotional subtypes showed in our results should be considered when planning for public health interventions for mental health particularly for those with lower education and worse previous mental health. After the COVID-19 pandemic, a rise in mental health problems is expected and governments should focus their effects on at-risk populations like care partners.

The pre-pandemic levels of social and emotional loneliness were predictors of overall and specific loneliness during the pandemic. Future research should look for more evidence on risk factors for

loneliness and its impact on care partners' physical and mental health. In addition, longitudinal studies are required to provide more details about how loneliness impacts care partners and the general population.

Data availability statement

Restrictions apply to the availability of the CLIC data. To request data access, readers should contact the research leader Roger O'Sullivan (Roger.OSullivan@publichealth.ie).

Ethics statement

The study was approved by the Ethics Committee of Ulster University (RG3) on 15 May 2020 and, where required, it was additionally ratified by ethics committees in participating countries. The participants provided their written informed consent to participate in this study.

Author contributions

TL: Writing – original draft, Writing – review & editing. TT: Writing – original draft, Writing – review & editing. AS: Writing – original draft, Writing – review & editing. BB: Writing – review & editing. FA: Writing – review & editing. CN: Writing – review & editing. MV: Writing – review & editing. PG-R: Writing – review & editing. LO: Writing – original draft. AP: Writing – original draft. LC: Writing – original draft. TG: Writing – original draft. RG: Writing – original draft. YC: Writing – original draft. IL: Writing – review & editing. BL: Writing – original draft, Writing – review & editing. CD: Writing – review & editing. RO: Writing – review & editing. CM: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsy.2024.1286141/full#supplementary-material>

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