



Validating the interpersonal theory of suicide among older adultspre- and peri-COVID-19 pandemic

Ceylan Okan, Lily Bilson, David Zhong, Gabrielle Weidemann & Phoebe E. Bailey

To cite this article: Ceylan Okan, Lily Bilson, David Zhong, Gabrielle Weidemann & Phoebe E. Bailey (2022): Validating the interpersonal theory of suicide among older adultspre- and peri-COVID-19 pandemic, *Aging & Mental Health*, DOI: [10.1080/13607863.2022.2116402](https://doi.org/10.1080/13607863.2022.2116402)

To link to this article: <https://doi.org/10.1080/13607863.2022.2116402>



© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 02 Sep 2022.



[Submit your article to this journal](#)



Article views: 613






[View related articles](#)



[View Crossmark data](#)

Validating the interpersonal theory of suicide among older adults pre- and peri-COVID-19 pandemic

Ceylan Okan^a , Lily Bilson^a, David Zhong^a, Gabrielle Weidemann^a  and Phoebe E. Bailey^{a,b} 

^aSchool of Psychology, Western Sydney University, Sydney, Australia; ^bGraduate School of Health, University of Technology Sydney, Sydney, Australia

ABSTRACT

Objectives: Global suicide rates are highest among older adults, and especially older men, yet proximal predictors of suicidal ideation in older age remain poorly understood. This study tested the Interpersonal Theory of Suicide in older men and women by investigating whether perceived burdensomeness and thwarted belongingness and/or their interaction are proximal predictors of suicidal ideation before versus during the global COVID-19 pandemic.

Methods: The sample ($N=208$) included healthy community-dwelling older Australian persons surveyed face-to-face pre-pandemic ($n=102$), or online peri-pandemic ($n=106$). Depression, social interaction, social satisfaction, thwarted belongingness, and perceived burdensomeness were assessed as predictors of suicidal ideation.

Results: Perceived burdensomeness was a more proximal predictor of suicidal ideation among older adults than depression or thwarted belongingness. Suicidal ideation and perceived burdensomeness were higher in men than women, but sex did not moderate the influence of perceived burdensomeness, thwarted belongingness or social satisfaction on suicidal desire. The interaction between perceived burdensomeness and thwarted belongingness predicted more additional variance in suicidal ideation in the older persons surveyed during the COVID-19 pandemic relative to those surveyed before the pandemic.

Conclusion: Suicidal ideation among older persons peri-pandemic is discussed, and recommendations are made for age-specific suicide prevention strategies.

ARTICLE HISTORY

Received 20 December 2021

Accepted 31 July 2022

KEYWORDS

Suicide; depression; burdensomeness; older persons

Introduction

The World Health Organization (2019) reports that suicide rates are highest in persons aged 70 years or older in almost all parts of the world. Suicide rates increase for both males and females between the ages of 60 and 90 years, and aging populations suggest that this is a growing problem (Shah et al., 2016). There are many changes associated with aging—such as physical capability, energy levels, retiring from work, relocation to more affordable housing, and death of loved ones—that may have a significant negative impact on mental health. Some trends in the older population include increasing sense of loneliness (Pinquart & Sorensen, 2001), sense of social isolation (Cornwell & Waite, 2009), perceived social disconnection (i.e. thwarted belongingness), and feeling they are a burden to others (i.e. perceived burdensomeness; Van Orden et al., 2012a). With the rate of growth in the aging population, the number of older people at risk of suicide is also predicted to increase (Shah et al., 2016).

The Interpersonal Theory of Suicide (Joiner, 2005; van Orden et al., 2010) specifies that whilst perceived burdensomeness is the most proximal predictor of suicidal ideation, the simultaneous presence of perceived burdensomeness and thwarted belongingness contributes to development of the desire for suicide (van Orden et al., 2012a). A large body of literature supports this model (Christensen et al., 2013; Cukrowicz et al., 2011; Joiner et al., 2009; van Orden et al., 2012b).

Perceived burdensomeness relates to a sense of effectiveness or competence, whereby an individual feels ineffective to the point that they are a burden on others which may lead to the desire to die (van Orden et al., 2010). Perceived burdensomeness may also be accompanied by a sense of hopelessness (Tucker et al., 2018). Perceived burdensomeness has been linked to increased risk for suicide, or 'suicidality', when several other variables have been accounted for, such as age, gender, hopelessness, depressive symptoms, and personality disorder status (Joiner, 2005). According to the Interpersonal Theory of Suicide, *belongingness* requires two components to be fully satisfied: interactions with others, and a feeling of being cared about. *Thwarted belongingness* has been associated with greater severity of depression, hopelessness, and suicidal ideation; however, it is not always a significant predictor of suicidal ideation on its own (Fisher et al., 2015).

A meta-analysis of 122 independent samples showed that the interaction of thwarted belongingness and perceived burdensomeness predicted more severe suicidal ideation (Chu et al., 2017). However, research assessing the theory in older adults is modest, and equivocal. Cukrowicz et al. (2011) found that perceived burdensomeness accounts for a significant proportion of suicidal ideation in older age (even after accounting for depression, hopelessness, and functional impairment). Sex was not a moderator of this association, and thwarted belongingness was not assessed. A further study showed that the

interaction between perceived burdensomeness and thwarted belongingness predicted suicidal ideation (Cukrowicz et al., 2013). Additionally, Guidry and Cukrowicz (2016) found that depression in older age moderated the relationship between death ideation and perceived burdensomeness, but not thwarted belongingness. Further research is needed to determine theory-based proximal predictors of suicidal ideation in older age.

Depression is characterised by low mood, diminished interest or pleasure in activities, the slowing down of thought and movement, feelings of worthlessness, fatigue, and recurrent thoughts of death (American Psychiatric Association, 2015). Major Depressive Disorder consistently presents as the most significant risk factor for suicide in older adults (Minayo & Cavalcante, 2015). Due to ageist perspectives viewing depression as a natural response to increased stressful life events in older age, and negative stigmatism, clinical Depression is thought to be significantly under-diagnosed (De Leo, 2018). Among older adults, depression is prevalent (Djernes, 2006) and potentially the strongest risk factor for suicidal ideation (Kumar et al., 2015; Conwell et al., 2002).

Prevention of factors most proximal to suicide will yield the most significant reduction in late-life suicide rates. With participation in formal social networks a strong protective factor against suicide and depression (Khurana & Raj, 2018), it has been suggested that the single greatest focus of suicide prevention in later life should be increasing social connectedness (van Orden & Conwell, 2011). In line with this idea, Vanderhorst and McLaren (2005) found a strong relationship between fewer social support resources and higher levels of suicidal ideation and depression symptoms in a community sample of older adults. Thus, older adults with varied social networks, a stronger sense of belongingness and overall relationship satisfaction, may be protected against developing suicidal thoughts.

The COVID-19 pandemic has disrupted traditional in-person social networks for older people. In the early stages of the pandemic, older adults did not report increased distress levels relative to young adults (Okan et al., 2021). This is consistent with evidence for better emotion regulation skills in older age (Wolfe & Isaacowitz, 2022). However, psychiatrists suggested that suicide risk factors among older adults—including loneliness, hopelessness, and social isolation—would increase worldwide during the pandemic (Wand et al., 2020). Factors that may influence deterioration in the mental health of older adults during the pandemic include fear of infection, boredom, insufficient access to information (Brooks et al., 2020), increased ageism in social media (Jimenez-Sotomayor et al., 2020), negativity in global aging narratives (Ng et al., 2021), and fears of financial insecurity (Reger et al., 2020).

The current study aimed to examine the utility of the Interpersonal Theory of Suicide (van Orden et al., 2010) for identifying proximal risks for suicidal ideation among two groups of older adults, one surveyed pre-pandemic and the other peri-pandemic. It was hypothesized that perceived burdensomeness, and the interaction between perceived burdensomeness and thwarted belongingness, would predict increased suicidal ideation. We expected that increased depression and reduced social support (i.e. social interaction and social satisfaction) would be associated with higher levels of suicidal ideation. These associations were predicted to be stronger in the peri-pandemic group relative to the pre-pandemic group. We also explored potential sex differences, because men aged 85 years and above have a suicide rate eight times higher than women in the same age group (ABS, 2015).

Method

Participants

The total sample ($N=209$) consisted of two groups of community-dwelling Australian older adults (60+ years). This included pre-pandemic (12 May 2019 to 10 March 2020) face-to-face participants recruited via a university volunteer database ($n=96$) or Wesley Mission independent living units ($n=7$), and peri-pandemic (14 May 2020 to 3 September 2020; at the early stages of the COVID-19 pandemic) online participants recruited via Qualtrics Panels ($n=106$). Both groups were provided with the same information sheet before deciding whether they would participate in the study.

Participants were screened for self-reported psychological or neurological conditions (e.g. Dementia, Stroke, Depression, Anxiety) prior to participating for exclusion purposes. The *Mini-Addenbrooke's Cognitive Examination*, or *MACE-III* (Hsieh et al., 2015) was administered to participants completing face-to-face testing to screen for cognitive decline. One participant who scored less than 21 (diagnostic of a dementia syndrome) out of 30 was excluded from analyses. The final sample ($N=208$; M age = 71.53 years; range = 60–97) consisted of 97 men (M age = 72.28 years; range = 60–90) and 111 women (M age = 70.88 years; range = 60–97). Participants were older in the pre-pandemic group ($n=102$; M age = 74.84 years; range = 62–97) compared to the peri-pandemic group ($n=106$; M age = 68.35 years; range = 60–82), $t(190.27) = 7.43$, $p < .001$. Using G*Power (Faul et al., 2007, 2009), a priori power analysis indicates that a regression model with 8 predictors requires 199 participants to detect a small-medium effect ($f^2 = .10$) with 90% power.

Participants reported their relationship status as Married ($n=113$; 54.3%), Divorced ($n=44$; 21.2%), Widowed ($n=27$; 13%), Never married ($n=12$; 5.8%), Separated ($n=6$; 2.9%), and De Facto (i.e. an unmarried couple living together; $n=6$; 2.9%); with Education Levels as having attained Less than high school and up to year 10 ($n=53$; 25.5%), Some college/university but no degree ($n=49$; 23.6%), Bachelor's degree ($n=45$; 21.6%), High school graduate (up to year 12) or diploma ($n=41$; 19.7%), Master degree ($n=16$; 7.7%), and Doctoral degree ($n=4$; 1.9%).

Face-to-face participants were compensated \$20 Australian, while online participants were compensated \$15 Australian. All participants gave written informed consent, and the research was approved by the Western Sydney University Human Research Ethics Committee (H13109).

Measures

The 15-item *Interpersonal Needs Questionnaire* (van Orden et al., 2012b) consists of nine items measuring perceived social disconnection (i.e. *thwarted belongingness*), and six items measuring feelings of being a burden to others (i.e. *perceived burdensomeness*). Items are rated on a scale from 0 (not at all true for me) to 6 (very true of me); higher scores imply increased feelings of Thwarted Belongingness and Perceived Burdensomeness. Cronbach's alpha indicated acceptable high internal consistency of items for both *thwarted belongingness* ($\alpha = .92$) and *perceived burdensomeness* ($\alpha = .92$) in the current sample.

The *Depression, Anxiety, Stress Scale* (Lovibond & Lovibond, 1995) 21-item tool was used to measure depression. The subscale consists of seven items. Participants rate how much each statement applied to them within the past week on a scale

from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Higher scores indicate greater depression. The DASS-21 has been found to have good internal consistency ($\alpha \geq .86$), excellent convergent validity and good discriminant validity, particularly for the depression scale, amongst older adults (Gloster et al., 2008). Internal consistency in the current sample was high for the depression subscale ($\alpha = .89$). This measure was chosen over the *Beck Anxiety Index* (BAI) and *Beck Depression Index* (BDI) as it is shorter, reducing participant fatigue. Anxiety and stress were measured but not analyzed here.

The 11-item *Duke Social Support Index* (Goodger et al., 1999) contains two subscales consisting of four items measuring *social interaction* and seven items measuring *satisfaction with social support* ('social satisfaction'). Higher scores indicate higher levels of social interaction and social satisfaction, respectively. This index has been validated in an Australian population aged 70+ years (Goodger et al., 1999). Internal consistency in the current sample was acceptable for *social interaction* ($\alpha = .53$) and strong for *satisfaction with social support* ($\alpha = .80$), in line with a separate validation study ($N = 565$; social interaction $\alpha = .58$, social satisfaction $\alpha = .80$) (Goodger et al., 1999).

The 10-item Suicide Ideation subscale of the original 31-item *Geriatric Suicide Ideation Scale* (Heisel & Flett, 2006) was used to measure late life suicide risk. This subscale has demonstrated strong reliability and validity and is supported as a brief measure of late-life suicide ideation (Heisel & Flett, 2006). Participants rate level of agreement from 1 (strongly disagree) to 5 (strongly agree) in response to questions such as, "I want to end my life". Scores range from 10 to 50; higher scores reflect greater suicidal ideation. Internal consistency in the current sample was high ($\alpha = .92$).

Procedure

Participants were advised prior to participating that the study involved answering questions about elder abuse (data not reported here) and thoughts about suicide and assisted dying

(data not reported here). The primary researcher followed up participants who indicated abuse, or suicidal thoughts or urges, to ensure participant safety. Participants provided informed consent and reported background information. The face-to-face participants completed the *M-ACE III* before answering the survey questions. Questionnaires were randomly presented using Qualtrics software (Qualtrics, Provo, UT).

Results

Sex and pandemic group differences

A series of 2×2 Analyses of Variance (ANOVAs) were performed with Sex (men and women) and Pandemic (pre-pandemic and peri-pandemic) as between-subjects factors. The main effects of Sex (Table 1) showed that men scored higher than women on perceived burdensomeness, thwarted belongingness, and suicidal ideation. Men scored lower than women on social interaction and social support. The main effects of Pandemic (Table 2) showed that scores on perceived burdensomeness, thwarted belongingness, and suicidal ideation were higher peri-pandemic than pre-pandemic, while scores on social interaction were higher pre-pandemic than peri-pandemic.

Correlations and stepwise regression

Pearson product-moment correlations ($\alpha = .05$) were calculated between scores for all variables (see Table 3). Depression, Thwarted Belongingness, and Perceived Burdensomeness were positively correlated with Suicidal Ideation, while Social Interaction and Social Satisfaction were negatively correlated with Suicidal Ideation.

A stepwise multiple regression explored which measures best predicted Suicidal Ideation. All predictor variables, Sex, and the TB*PB interaction were entered. At step 1, the TB*PB interaction was the best predictor, $R = .75$, $R^2 = .56$, adjusted $R^2 = .56$, $F(1, 206) = 261.89$, $p < .001$. At step 2, the addition of Depression slightly improved the model, $R = .77$, $R^2 = .59$, adjusted $R^2 = .59$,

Table 1. Descriptive and ANOVA Statistics for Sex Differences.

	M (SD)			F	p	η_p^2
	Overall	Men	Women			
Depression*	2.59 (3.15)	2.75 (3.42)	2.44 (2.90)	0.37	.550	.00
Perceived Burdensomeness*	0.50 (0.88)	0.68 (1.00)	0.34 (0.72)	6.95	.010	.03
Thwarted Belongingness	1.18 (1.22)	1.40 (1.32)	0.99 (1.10)	5.25	.020	.03
Social Interaction	12.48 (4.40)	11.76 (4.53)	13.10 (4.21)	3.92	.049	.02
Social Satisfaction	15.45 (2.46)	15.07 (2.44)	15.78 (2.45)	3.98	.047	.02
Suicidal Ideation*	14.03 (6.02)	15.36 (7.16)	12.87 (4.54)	8.27	< .001	.04

Note. $df = 204$ and $F(1, 204)$. *Where assumptions of normality and homogeneity were unsatisfactory with Levene's Test being significant ($p < .003$), we report the statistics for equal values not assumed. All Sex \times Pandemic interactions were not significant; we have not reported these results here ($F_s < 3.69$, $p_s > .06$).

Table 2. Descriptive and ANOVA statistics for pandemic differences.

	M (SD)		F	p	η_p^2
	Pre-pandemic	Peri-pandemic			
Depression*	2.27 (2.65)	2.89 (3.55)	1.89	.170	.00
Perceived Burdensomeness*	0.29 (0.44)	0.70 (1.12)	12.44	< .001	.06
Thwarted Belongingness	0.98 (1.12)	1.38 (1.29)	.562	.020	.03
Social Interaction	14.26 (4.36)	10.75 (3.72)	36.98	.001	.15
Social Satisfaction	15.66 (2.31)	15.25 (2.60)	1.12	.280	.01
Suicidal Ideation*	13.14 (4.04)	14.90 (7.37)	4.16	.040	.02

Note. $df = 204$ and $F(1, 204)$. *Where assumptions of normality and homogeneity were unsatisfactory with Levene's Test being significant ($p < .003$), we report the statistics for equal values not assumed. All Sex \times Pandemic interactions were not significant; we have not reported these results here ($F_s < 3.69$, $p_s > .06$).

$F(2, 205) = 149.72, p < .001$. At the final step 3, the addition of Perceived Burdensomeness further slightly improved the model, $R = .78, R^2 = .61$, adjusted $R^2 = .60, F(3, 204) = 106.23, p < .001$. The variables of Sex, Thwarted Belongingness, Social Satisfaction, and Social Interaction were excluded from the stepwise regression model because they did not significantly improve model fit.

To test whether sex interacted with any of the other predictors, a second stepwise regression analysis was conducted including interaction variables (i.e. Sex*Depression, Sex*Perceived Burdensomeness, Sex*Thwarted Belongingness, Sex*Social Interaction, Sex*Social Satisfaction, and Sex*Suicidal Ideation). At step 1, Perceived Burdensomeness remained the best predictor of suicidal ideation, $R = .73, R^2 = .53$, adjusted $R^2 = .53, F(1, 206) = 237.10, p < .001$. At step 2, the addition of Depression was retained, $R = .77, R^2 = .59$, adjusted $R^2 = .59, F(2, 205) = 148.76, p < .001$. However, at the final step 3, the addition of the interaction variable of Sex*Social Satisfaction instead of Thwarted Belongingness, slightly improved the model, $R = .78, R^2 = .60$, adjusted $R^2 = .60, F(3, 204) = 103.45, p < .001$. The variables of Sex, Social Satisfaction, Social Interaction, Thwarted Belongingness, and the interaction factors of Sex*Depression, Sex*Social Interaction and Sex*Thwarted Belongingness, were excluded as they did not significantly improve model fit. The Sex*Social Satisfaction interaction did not change the level of prediction of the model from the previous stepwise analyses, and in fact, accounted for the same amount of variance as Thwarted Belongingness in the previous model.

Hierarchical regression

With alpha set at .05, a hierarchical multiple regression was then performed to examine predictors that had a significant influence on suicidal ideation in the stepwise regression (see Table 4). After accounting for Depression at Step 1 which is a confirmed risk factor for suicidal ideation, variables were subsequently entered into the model, in order of weakest to strongest predictors: Sex, Social Interaction, Social Satisfaction, Thwarted Belongingness, Sex*Social Satisfaction, Perceived Burdensomeness, and TB*PB. This hierarchy was chosen to explore cumulative additional variance in suicidal ideation. At the final step 8, the addition of TB*PB reliably improved R^2 , with $R = .79, R^2 = .62$, adjusted $R^2 = .61, F(8, 199) = 40.61, p < .001$. Perceived Burdensomeness alone accounted for 17% of additional variance in suicidal ideation and was the largest single predictor following Depression.

Pre- vs. peri-COVID-19 pandemic moderated mediation

We adopted an exploratory approach to mediation given the novelty of our study with sampling occurring before and during the COVID-19 pandemic. We tested whether suicidal ideation was mediated by individual differences in mental and social health factors using the same hierarchical multiple regression model in Table 4, within the pandemic sample groups.

First, we tested whether Predictors were entered in the same order as shown in Table 5. For the pre-pandemic group, step 7 yielded the best model for predicting variance in suicidal

Table 3. Correlations.

	1	2	3	4	5
1. Depression	–				
2. Perceived Burdensomeness	.507**	–			
3. Thwarted Belongingness	.660**	.587**	–		
4. Social Interaction	–.260**	–.216**	–.446**	–	
5. Social Satisfaction	–.472	–.386**	–.683**	.320**	–
6. Suicidal Ideation	.577**	.731**	.603**	–.244**	–.441**

**Correlation is significant at the 0.01 level (2-tailed); df = 206.

Table 4. Hierarchical multiple regression predicting suicidal ideation.

Step	Variables	B	β	R^2 change	Final B	Final β
1	Depression	1.10	.58	.33**	0.38	.20**
2	Sex	–2.15	–.18	.03*	1.15	.10
3	Social Interaction	–0.10	–.08	.01	0.01	.00
4	Social Satisfaction	–0.45	–.18	.03*	0.08	.03
5	Thwarted Belongingness	1.75	.36	.04**	0.26	.05
6	Sex*Social Satisfaction	0.31	.48	.00	–0.13	–.19
7	Perceived Burdensomeness	3.63	.53	.17**	2.14	.31*
8	TB*PB	0.61	.29	.01**	0.61	.29*
	Constant				10.96	

TB, Thwarted Belongingness; PB, Perceived Burdensomeness.

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

Table 5. Hierarchical multiple regression predicting suicidal ideation for the peri-pandemic sample.

Step	Variables	B	β	R^2 change	Final B	Final β
1	Depression	1.10	.58	.33**	0.38	3.31**
2	Sex	–2.15	–.18	.03*	1.15	0.32
3	Social Interaction	–0.10	–.08	.01	0.01	0.08
4	Social Satisfaction	–0.45	–.18	.03*	0.08	0.19
5	Thwarted Belongingness	1.75	.36	.04**	0.26	0.65
6	Sex*Social Satisfaction	0.31	.48	.00	–0.13	–0.55
7	Perceived Burdensomeness	3.63	.53	.17**	2.14	2.89**
8	TB*PB	0.61	.29	.01*	0.06	2.34*
	Constant				10.96	

TB, Thwarted Belongingness; PB, Perceived Burdensomeness.

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

ideation, which include variables of Depression, Sex, Social Interaction, Social Satisfaction, Thwarted Belongingness, Sex*Social Satisfaction and Perceived Burdensomeness ($R = .68$, $R^2 = .46$, adjusted $R^2 = .42$, $F(7, 94) = 11.48$, $p < .001$).

For the peri-pandemic group, the final step 8 was the best predictor model, including all variables of Depression, Sex, Social Interaction, Social Satisfaction, Thwarted Belongingness, Sex*Social Satisfaction, Perceived Burdensomeness, and TB*PB, in predicting the variance in suicidal ideation ($R = .82$, $R^2 = .67$, adjusted $R^2 = .64$, $F(8, 97) = 24.27$, $p < .001$).

Discussion

The role of depression in suicidal ideation among older adults is well established (Szanto et al., 2002; Kumar et al., 2015; Choi et al., 2015; Wand et al., 2020). However, evidence for the influence of perceived burdensomeness and thwarted belongingness on suicidal ideation in older age is both mixed and preliminary (Chu et al., 2017; Cukrowicz et al., 2011; van Orden et al., 2012a). To our best knowledge, this is the first study to examine the Interpersonal Theory of Suicide within the context of the COVID-19 pandemic, comparing groups sampled before and during the pandemic. The results provide support for the theory that greater perceived burdensomeness and thwarted belongingness increase risk of suicidal ideation in older age. However, perceived burdensomeness is the more proximal predictor. Moreover, the interaction of these two factors even more strongly predicts suicidal ideation in a sample of older adults surveyed during the pandemic relative to a group surveyed pre-pandemic. This likely reflects the higher suicidal ideation scores from pre- to peri-pandemic. This is consistent with the Interpersonal Theory of Suicide as well as psychiatrists' predictions that as distress levels increase during the COVID-19 pandemic, suicidal ideation will also increase among older adults during this time of distress (Reger et al., 2020).

In line with men over the age of 85 years being the most represented age and sex group attempting suicide (ABS, 2015), men scored higher than women on suicidal ideation, as well as thwarted belongingness and perceived burdensomeness. This provides support for the explanatory power of the Interpersonal Theory of Suicide among older men, while also noting that sex only moderated the association between reduced social satisfaction and suicidal ideation. This may be because, relative to men, women invest more time and effort into their social relationships (Eagly & Wood, 1999). The correlational data suggest that older persons experiencing depression are more likely to report increased feelings of thwarted belongingness than perceived burdensomeness. Further, those experiencing higher levels of perceived burdensomeness are more likely to experience suicidal ideation than older persons experiencing any of the other predictors.

The results suggest that risk factors associated with suicidality include feeling down and 'blue' (Depression) and feeling a burden to families, friends, and/or support services (Perceived Burdensomeness). Given the COVID-19 pandemic could affect mental health of older adults in various ways (Okan et al., 2021), the difference in the distress levels experienced between the two groups within this study may be attributed to the older adults in only one of the groups experiencing the COVID-19 pandemic. Our results also support findings from other studies, whereby the interaction between perceived burdensomeness and thwarted belongingness predicts additional variance in

suicidal ideation in older adults, and we extend this evidence to older adults sampled during the COVID-19 pandemic. Considering that Cukrowicz et al. (2013) results were based on a primary care setting, it is possible that the distress levels of their sample (subjective perceived burdensomeness and thwarted belongingness) were higher than the general community population. For the peri-pandemic group in the current study, stay-at-home lockdown restrictions in Australia at the time of testing prevented households from interacting with other households—thus, if family or friends of the older person did not live with them in the same household, they were not allowed to see each other in person. The restrictions also included a 5 km travel limit, and people were only able to leave their homes for essential reasons, including accessing health-care and medical attention, and obtaining necessary items such as food. It is possible that these restrictions contributed to the distress reported by this sample. This is consistent with Van Orden et al.'s (2010) second hypothesis that simultaneous presence of perceived burdensomeness and thwarted belongingness is associated with suicidal desire. Although, that hypothesis specifies that feeling hopeless that these states will remain the same, is a further requirement for suicidal desire (also see Tucker et al., 2018).

With the increasing size of the older-person population, and an indefinite end to the COVID-19 pandemic, it is important to understand specific risk factors when assessing for the possibility of developing suicidal ideation. The current results provide support for the Interpersonal Theory of Suicide (Joiner, 2005; van Orden et al., 2010) in older persons, and in doing so identify factors most proximal to developing suicidal ideation that may be targeted by prevention measures. Reducing perceived burdensomeness may yield the most significant reduction in late-life suicide rates. This is consistent with Van Orden et al.'s (2010) first hypothesis that *either* thwarted belonging or perceived burdensomeness may increase passive suicidal ideation. The hierarchical regression models in the current study showed that, averaged across the entire sample, as well as within the peri-pandemic sample, depression is the strongest predictor of suicidal ideation, accounting for 33% of the variance in suicidal ideation. Perceived burdensomeness was the second greatest overall predictor, accounting for 17% of variance in suicidal ideation. However, because perceived burdensomeness is the strongest correlate with suicidal ideation ($r = .73$), it likely accounts for more variance than depression when occurring independently (see Figure 1). Indeed, older persons living with physical disability are more likely to develop suicidal ideation if they also have increased perceived burdensomeness, and low perceived social support (Shim et al., 2017).

Social connectedness may inadvertently decrease later in life due to limited mobility or capability. Participation in formal social networks is a protective factor against suicide and depression, and therefore, if the older person has a relatively limited social network, they might perceive themselves as a burden to that support network (Khurana & Raj, 2018). This is consistent with Vanderhorst and McLaren (2005) findings of a strong relationship between fewer social support resources and higher levels of suicidal ideation and depression. By increasing social support resources, this may in turn reduce the levels of burden on those resources. Theoretically, this should also decrease distress levels including depression and perceived burdensomeness. One limitation of the current study is the between-subjects, cross-sectional design that prevents an analysis of causality.

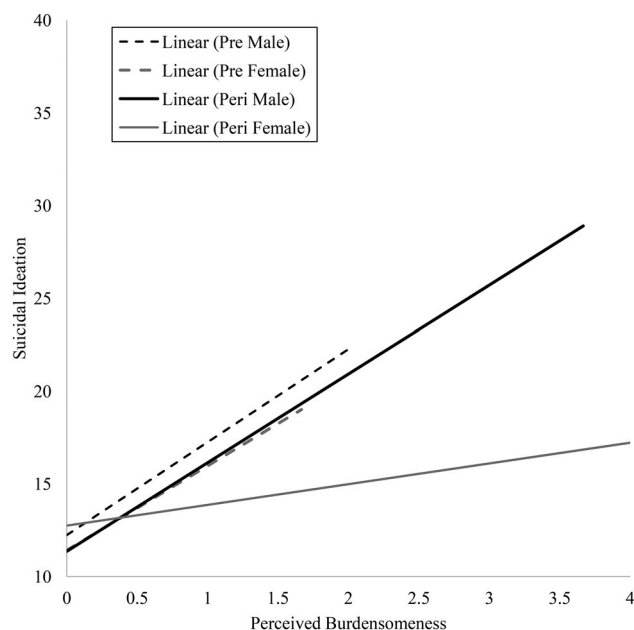


Figure 1. The relationship between Perceived Burdensomeness and Suicidal Ideation in Pre-COVID-19 (Pre) Males (black broken line) and Females (grey broken line) and Peri-COVID-19 (Peri) Males (black solid line) and Females (grey solid line).

Nevertheless, the current findings and previous body of research suggest that any attempt to design suicide prevention strategies peri-pandemic, and potentially post-pandemic, must consider the interaction between thwarted belongingness and perceived burdensomeness for the effective assessment, diagnosis, and treatment of suicidal ideation and depression in older adults.

The current study explored the validity of the Interpersonal Theory of Suicide for identifying proximal risk factors for suicidal ideation among older adults before, and during, the COVID-19 pandemic. Greater perceived burdensomeness and thwarted belongingness predicted increased suicidal ideation. This relationship was not moderated by sex, even though, relative to older women, older men reported higher levels of suicidality, thwarted belongingness, and perceived burdensomeness. The results imply that older persons experiencing depression, perceived burdensomeness, low social interaction, and low social satisfaction, are more likely to experience suicidal ideation. Older adults experiencing both perceived burdensomeness and thwarted belongingness are also more likely to experience suicidal ideation during the pandemic relative to pre-pandemic. These findings offer a unique and original 'first look' into suicide ideation levels of older adults surveyed either before, or during, the COVID-19 pandemic, through the theoretical lens of the Interpersonal Theory of Suicide. Studies to date primarily suggest that enhanced emotion regulation among older adults is associated with relatively stable wellbeing during the early stages of the COVID-19 pandemic (Wolfe & Isaacowitz, 2022). The current data provide an important alternative view by identifying proximal predictors of increased suicidal ideation among this cohort during the pandemic.

Acknowledgements

We would like to thank Tim Sussman and Wesley Mission (Wesley LifeForce) Sydney South, for his facilitation of testing participants living in the Independent Living Units.

Disclosure statement

The authors report no conflict of interest.

Funding

This research was supported under Australian Research Council's Discovery Projects funding scheme (project DP200100876).

Data Availability statement

Dataset Link, uploaded to OSF https://osf.io/dvf6h/?view_only=4dce5f1d9c1a49518c321f4892d8542f

ORCID

Ceylan Okan <http://orcid.org/0000-0002-7284-0610>

Gabrielle Weidemann <http://orcid.org/0000-0002-1469-8089>

Phoebe E. Bailey <http://orcid.org/0000-0001-8960-1897>

References

- ABS (2015). Australian Bureau of Statistics 2016. 3303.0 - Causes of death.
- American Psychiatric Association. (2015). *Depressive Disorders: DSM-5® Selections*. American Psychiatric Pub.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920. [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8)
- Choi, N. G., DiNitto, D. M., & Marti, C. N. (2015). Middle-aged and older adults who had serious suicidal thoughts: Who made suicide plans and nonfatal suicide attempts? *International Psychogeriatrics*, 27(3), 491–500. <https://doi.org/10.1017/S1041610214002464>
- Christensen, H., Batterham, P. J., Soubelet, A., & Mackinnon, A. J. (2013). A test of the interpersonal theory of suicide in a large community-based cohort. *Journal of Affective Disorders*, 144(3), 225–234. <https://doi.org/10.1016/j.jad.2012.07.002>
- Chu, C., Buchman-Schmitt, J. M., Stanley, I. H., Hom, M. A., Tucker, R. P., Hagan, C. R., Rogers, M. L., Podlogar, M. C., Chiurliza, B., Ringer, F. B., Michaels, M. S., Patros, C. H. G., & Joiner, T. E. (2017). The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. *Psychological Bulletin*, 143(12), 1313–1345. <https://doi.org/10.1037/bul0000123>
- Conwell, Y., Duberstein, P. R., & Caine, E. D. (2002). Risk factors for suicide in later life. *Biological Psychiatry*, 52(3), 193–204. [https://doi.org/10.1016/S0006-3223\(02\)01347-1](https://doi.org/10.1016/S0006-3223(02)01347-1)
- Cornwell, E. Y., & Waite, L. J. (2009). Measuring social isolation among older adults using multiple indicators from the NSHAP study. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 64(suppl_1), i38–i46.
- Cukrowicz, K. C., Cheavens, J. S., Van Orden, K. A., Ragain, R. M., & Cook, R. L. (2011). Perceived burdensomeness and suicide ideation in older adults. *Psychology and Aging*, 26(2), 331–338. <https://doi.org/10.1037/a0021836>
- Cukrowicz, K. C., Jahn, D. R., Graham, R. D., Poindexter, E. K., & Williams, R. B. (2013). Suicide risk in older adults: Evaluating models of risk and predicting excess zeros in a primary care sample. *Journal of Abnormal Psychology*, 122(4), 1021–1030. <https://doi.org/10.1037/a0034953>
- De Leo, D. (2018). Ageism and suicide prevention. *The Lancet. Psychiatry*, 5(3), 192–193. [https://doi.org/10.1016/S2215-0366\(17\)30472-8](https://doi.org/10.1016/S2215-0366(17)30472-8)
- Djernes, J. K. (2006). Prevalence and predictors of depression in populations of elderly: A review. *Acta Psychiatrica Scandinavica*, 113(5), 372–387. <https://doi.org/10.1111/j.1600-0447.2006.00770.x>
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54(6), 408–423. <https://doi.org/10.1037/0003-066X.54.6.408>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191.
- Fisher, L. B., Overholser, J. C., Ridley, J., Braden, A., & Rosoff, C. (2015). From the outside looking in: Sense of belonging, depression, and suicide risk. *Psychiatry*, 78(1), 29–41.

- Gloster, A. T., Rhoades, H. M., Novy, D., Klotsche, J., Senior, A., Kunik, M., Wilson, N., & Stanley, M. A. (2008). Psychometric properties of the Depression Anxiety and Stress Scale-21 in older primary care patients. *Journal of Affective Disorders*, 110(3), 248–259. <https://doi.org/10.1016/j.jad.2008.01.023>
- Goodger, B., Byles, J., Higgsbotham, N., & Mishra, G. (1999). Assessment of a short scale to measure social support among older people. *Australian and New Zealand Journal of Public Health*, 23(3), 260–265. <https://doi.org/10.1111/j.1467-842x.1999.tb01253.x>
- Guidry, E. T., & Cukrowicz, K. C. (2016). Death ideation in older adults: Psychological symptoms of depression, thwarted belongingness, and perceived burdensomeness. *Aging & Mental Health*, 20(8), 823–830. <https://doi.org/10.1080/13607863.2015.1040721>
- Heisel, M. J., & Flett, G. L. (2006). The development and initial validation of the Geriatric Suicide Ideation Scale. *The American Journal of Geriatric Psychiatry*, 14(9), 742–751. <https://doi.org/10.1097/01.JGP.0000218699.27899.f9>
- Hsieh, S., McGrory, S., Leslie, F., Dawson, K., Ahmed, S., Butler, C. R., Rowe, J. B., Mioshi, E., & Hodges, J. R. (2015). The Mini-Addenbrooke's Cognitive Examination: A new assessment tool for dementia. *Dementia and Geriatric Cognitive Disorders*, 39(1–2), 1–11. <https://doi.org/10.1159/000366040>
- Jimenez-Sotomayor, M. R., Gomez-Moreno, C., & Soto-Perez-de-Celis, E. (2020). Coronavirus, ageism, and Twitter: An evaluation of tweets about older adults and COVID-19. *Journal of the American Geriatrics Society*, 68(8), 1661–1665. <https://doi.org/10.1111/jgs.16508>
- Joiner, T. E. (2005). *Why people die by suicide*. Harvard University Press.
- Joiner, T. E., Jr, Van Orden, K. A., Witte, T. K., Selby, E. A., Ribeiro, J. D., Lewis, R., & Rudd, M. D. (2009). Main predictions of the interpersonal–psychological theory of suicidal behavior: Empirical tests in two samples of young adults. *Journal of Abnormal Psychology*, 118(3), 634–646. <https://doi.org/10.1037/a0016500>
- Khurana, H., & Raj, A. (2018). Aging and suicide. In *Handbook of research on geriatric health, treatment, and care 2018* (pp. 409–429). IGI Global.
- Kumar, P. N. S., Anish, P. K., & George, B. (2015). Risk factors for suicide in elderly in comparison to younger age groups. *Indian Journal of Psychiatry*, 57(3), 249–254. <https://doi.org/10.4103/0019-5545.166614>
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- Minayo, M. C. S., & Cavalcante, F. G. (2015). Suicide attempts among the elderly: A review of the literature (2002/2013). *Ciencia & Saude Coletiva*, 20(6), 1751–1762. <https://doi.org/10.1590/1413-81232015206.10962014>
- Ng, R., Chow, T. Y. J., & Yang, W. (2021). Culture Linked to Increasing Ageism during Covid-19: Evidence from a 10-billion-word Corpus across 20 Countries. *The Journals of Gerontology: Series B*, 76(9), 1808–1816. <https://doi.org/10.1093/geronb/gbab057>
- Okan, C., Weidemann, G., & Bailey, P. E. (2021). "Alone, but not lonely": The impact of COVID-19 on older persons and the role of technology in staying connected. *Mental Health Effects of COVID*, 19, 117–131. <https://doi.org/10.1016/B978-0-12-824289-6.00017-9>
- Pinquart, M., & Sorensen, S. (2001). Influences on loneliness in older adults: A meta-analysis. *Basic and Applied Social Psychology*, 23(4), 245–266. https://doi.org/10.1207/S15324834BASP2304_2
- Reger, M. A., Stanley, I. H., & Joiner, T. E. (2020). Suicide mortality and coronavirus disease 2019 – A perfect storm? *JAMA Psychiatry*, 77(11), 1093–1094. <https://doi.org/10.1001/jamapsychiatry.2020.1060>
- Shah, A., Bhat, R., Zarate-Escudero, S., DeLeo, D., & Erlangsen, A. (2016). Suicide rates in five-year age-bands after the age of 60 years: The international landscape. *Aging & Mental Health*, 20(2), 131–138. <https://doi.org/10.1080/13607863.2015.1055552>
- Shim, E. J., Song, Y. W., Park, S. H., Lee, K. M., Go, D. J., & Hahm, B. J. (2017). Examining the relationship between pain catastrophizing and suicide risk in patients with rheumatic disease: The mediating role of depression, perceived social support, and perceived burdensomeness. *International Journal of Behavioral Medicine*, 24(4), 501–512. <https://doi.org/10.1007/s12529-017-9648-1>
- Szanto, K., Gildengers, A., Mulsant, B. H., Brown, G., Alexopoulos, G. S., & Reynolds, C. F. (2002). Identification of suicidal ideation and prevention of suicidal behaviour in the elderly. *Drugs & Aging*, 19(1), 11–24. <https://doi.org/10.2165/00002512-200219010-00002>
- Tucker, R. P., Hagan, C. R., Hill, R. M., Slish, M. L., Bagge, C. L., Joiner, T. E., Jr, & Wingate, L. R. (2018). Empirical extension of the interpersonal theory of suicide: Investigating the role of interpersonal hopelessness. *Psychiatry Research*, 259, 427–432. <https://doi.org/10.1016/j.psychres.2017.11.005>
- van Orden, K. A., Bamonti, P. M., King, D. A., & Duberstein, P. R. (2012a). Does perceived burdensomeness erode meaning in life among older adults? *Aging & Mental Health*, 16(7), 855–860. <https://doi.org/10.1080/13607863.2012.657156>
- van Orden, K. A., & Conwell, Y. (2011). Suicides in late life. *Current Psychiatry Reports*, 13(3), 234–241. <https://doi.org/10.1007/s11920-011-0193-3>
- van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. Jr. (2012b). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, 24(1), 197–215. <https://doi.org/10.1037/a0025358>
- van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The Interpersonal Theory of Suicide. *Psychological Review*, 117(2), 575–600. <https://doi.org/10.1037/a0018697>
- Vanderhorst, R. K., & McLaren, S. (2005). Social relationships as predictors of depression and suicidal ideation in older adults. *Aging & Mental Health*, 9(6), 517–525. <https://doi.org/10.1080/13607860500193062>
- Wand, A. P. F., Zhong, B. L., Chiu, H. F. K., Draper, B., & De Leo, D. (2020). COVID-19: The implications for suicide in older adults. *International Psychogeriatrics*, 32(10), 1225–1230. <https://doi.org/10.1017/S1041610220000770>
- Wolfe, H. E., & Isaacowitz, D. M. (2022). Aging and emotion regulation during the COVID-19 pandemic. *Aging & Mental Health*, 26(5), 890–897. <https://doi.org/10.1080/13607863.2021.1910797>
- World Health Organization (2019, May 10). *Ageing and Health 2018*. www.who.int/news-room/fact-sheets/detail/ageing-and-health.