



Coping competence and hopelessness moderate the influence of perceived burdensomeness on suicidal ideation in undergraduate college students

Joseph D. Hovey¹ · Michelle E. Roley-Roberts² · Gabriela Hurtado³ · Laura D. Seligman¹ · Jason C. Levine⁴ · Prachi Kene⁵ · Rebecca N. Gonzalez¹

Accepted: 15 December 2022

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022

Abstract

According to the interpersonal theory of suicide, the perception of imposing a burden on loved ones increases the risk for suicidal ideation. Little research, however, has examined the interaction of burdensomeness with cognitive variables in predicting suicidal ideation in college students even though the relationship between burdensomeness and ideation may be contingent on levels of cognitive risk factors. The present study thus examined the relationships between burdensomeness, hopelessness, coping competence, and suicidal ideation. Questionnaires were administered to 279 undergraduate students from a university in the Midwest United States. After controlling for depression, hopelessness, and coping competence, burdensomeness significantly predicted ideation and accounted for variance above and beyond the control variables. Moreover, the relationship between burdensomeness and suicidal ideation was significantly moderated by coping competence and hopelessness. The findings suggest that perceived burdensomeness plays a critical role in the risk for suicide in college students. More specifically, the findings suggest that coping competence and hopelessness can be ideal targets for interventions as changes in these variables may attenuate the association between perceived burdensomeness and suicidal ideation.

Keywords Perceived burdensomeness · Coping competence · Hopelessness · Suicidal ideation · College students

Introduction

Suicide is the second leading cause of death in college-aged individuals worldwide (World Health Organization, 2019). Moreover, worldwide, 6% of college-aged individuals have attempted suicide and 18% have experienced suicidal ideation (Lim et al., 2019). In the United States, suicide is the

second leading cause of death in college-aged individuals (Heron, 2019). Furthermore, 9% of students in the United States have attempted suicide and nearly 1 in 4 undergraduate college students in the United States have seriously considered suicide (American College Health Association, 2021; Liu et al., 2019). Suicidal ideation is an important variable to measure in suicide risk and prevention research because it is a modifiable risk factor and a precursor to suicide attempts and completed suicide (Hovey & King, 2002).

In the past dozen years, researchers have utilized the interpersonal theory of suicide (Joiner, 2005) as a framework for examining suicidal ideation in college students across various nations and cultures. According to the interpersonal theory, the presence of perceived burdensomeness and thwarted belongingness leads to suicidal ideation (Joiner, 2005). Thwarted belongingness refers to a perceived sense of social disconnectedness whereas perceived burdensomeness refers to a sense that one is a burden on others. Although social disconnectedness has long been studied as a risk factor for suicide, perceived burdensomeness is a relatively new risk factor in the suicide literature (Hill & Pettit,

✉ Joseph D. Hovey
joseph.hovey@utrgv.edu

¹ Behavioral Health Laboratory, Department of Psychological Science, The University of Texas Rio Grande Valley, 1201 W. University Drive, Edinburg, TX 78539, USA

² Department of Psychiatry, Creighton University School of Medicine, Omaha, NE, USA

³ Prickly Pear Therapy and Training, Austin, TX, USA

⁴ Department of Psychiatry, The University of Toledo Medical Center, Toledo, OH, USA

⁵ Counseling, Educational Leadership and School Psychology Department, Rhode Island College, Providence, RI, USA

2014). Moreover, perceived burdensomeness, in particular, has received strong support as a risk factor for suicidal ideation (Ma et al., 2016).

For example, burdensomeness has significantly predicted suicidal ideation above and beyond depression and demographic variables in college students in Ireland (Bhargav & Swords, 2022), China (Zhang et al., 2013), South Korea (Choi & Bae, 2020), and the United States (Becker et al., 2020; O’Keefe et al., 2014; Servaty-Seib et al., 2021; Van Orden et al., 2008; Wong et al., 2011). In addition, burdensomeness has significantly mediated the relationships between adverse childhood experiences and suicidal ideation in college students in Ireland (Bhargav and Swords, 2022), between future orientation and ideation in college students in Hungary (Chang et al., 2017), and between depression and ideation (Cole et al., 2013), eating disorder symptoms and ideation (Kwan et al., 2014), perfectionism and ideation (Rasmussen et al., 2012), and racial microaggression and ideation in college students in the United States (Hollingsworth et al., 2017). Finally, as the interpersonal theory posits, the interaction between perceived burdensomeness and belongingness has significantly predicted suicidal ideation in college students in South Korea (Seo, 2020) and the United States (O’Keefe et al., 2014; Van Orden et al., 2008; Wong et al., 2011).

Relatively little research, however, has examined the interaction of burdensomeness with other possible key variables in predicting suicidal ideation in college students even though the level of association between burdensomeness and ideation may be contingent on levels of cognitive risk factors (Buitron et al., 2017), for example. Indeed, research (Rasmussen & Wingate, 2011) has found that perceived burdensomeness significantly interacted with optimism to predict suicidal ideation in college students: students with high burdensomeness and low optimism experienced greater ideation than students with high burdensomeness and high optimism. Moreover, perceived burdensomeness significantly interacted with mindfulness such that students with high burdensomeness and low mindfulness reported greater ideation than students with high burdensomeness and high mindfulness (Buitron et al., 2017).

It is important that additional studies examine possible moderators in the relationship between burdensomeness and suicide ideation given that such variables could serve as potential targets in intervention efforts that aim to reduce suicidal ideation in individuals experiencing burdensomeness. The present study thus seeks to extend the literature on the moderating influences of cognitive risk factors on perceived burdensomeness. We examined how burdensomeness interacts with hopelessness in predicting suicidal ideation in college students, given that hopelessness is a prominent cognitive risk factor associated with suicide behavior (Ribeiro et al., 2018). We also examined the interaction

of burdensomeness and coping competence in predicting suicidal ideation. The construct of coping competence is based on helplessness theories and refers to the self-belief that one has the capacity to cope well, irrespective of the method or coping style employed to adapt to a difficult situation (Schroder, 2004). High coping competence would thus be expected to attenuate the relationship between a mental health risk factor and mental health problem. In fact, this is what research has found (e.g., Schroder & Ollis, 2013).

Purposes of study

The specific purposes of our study were to examine the relationships between coping competence, hopelessness, burdensomeness, and suicidal ideation in college students; examine the influence that burdensomeness has on suicidal ideation above and beyond the influence of depression, coping competence and hopelessness; and examine the interactions of burdensomeness with coping competence and hopelessness in predicting suicidal ideation. We expected that the variables would be strongly intercorrelated; burdensomeness would be a significant independent predictor of suicidal ideation; and the relationship between burdensomeness and suicidal ideation would be significantly moderated by coping competence and hopelessness.

Methods

Participants

Participants were 279 undergraduate students (72% female) from a university in the Midwest United States. The mean age of participants was 19.9 ($SD = 1.4$). Seventy percent of participants indicated that they were European American; 16% were African American; 4% were Latino/a American; 3% were Multiracial; 2% were Asian-American; and 5% were “other” ethnicity.

Measures

Demographic information

Participants completed a demographic form, which included questions on gender, age, and ethnicity.

Depression

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) was used to assess depressive symptoms. The BDI-II consists of 21 items, with possible scores ranging from 0 to 63. Higher total scores indicate increased depressive

symptoms. The BDI-II has demonstrated excellent internal consistency reliability and construct validity with college students (Carmody, 2005; Steer & Clark, 1997) and had excellent internal consistency in the present study ($\alpha = .93$).

Hopelessness

The Beck Hopelessness Scale (BHS; Beck & Steer, 1988) was used to assess hopelessness. The BHS consists of 20 true-false items assessing an individual's negative expectations about the future. Possible scores range from 0 to 20 with higher scores indicating greater levels of hopelessness. The BHS has demonstrated excellent internal consistency reliability and construct validity with college students (Hovey et al., 2014a; Steed, 2001). In the present study, the BHS had good internal consistency ($\alpha = .82$).

Perceived burdensomeness

Perceived burdensomeness was assessed by the perceived burdensomeness subscale from the Suicide Cognitions Scale (SCS; Rudd, 2004), which consists of 2 items ("The world would be better off without me"; "I am a burden to my family") scored on a 5-point scale ("Strongly Disagree" to "Strongly Agree"). Previous studies (Jahn et al., 2011; Slee et al., 2008a, b) have used this subscale to assess burdensomeness. Its internal consistency in the present study was good ($\alpha = .78$).

Coping competence

Three items from the SCS (Rudd, 2004) ("No one can help solve my problems"; "Nothing can help solve my problems"; "I can't cope with my problems any longer") were used to measure (lack of) coping competence. For ease of interpretation, these items were reverse scored so that greater scores equaled greater coping competence. The internal consistency for these items was good ($\alpha = .82$).

Suicidal ideation

Suicidal ideation was assessed by The Adult Suicidal Ideation Questionnaire (ASIQ; Reynolds, 1991a), which consists of 25 items that assess the nature and frequency of suicidal ideation within the past month. Each item is rated on a 7-point scale ranging from 0 ("I never had this thought") to 6 ("almost every day"). The ASIQ has excellent internal consistency reliability and construct validity with college students (Reynolds, 1991b) and had excellent internal consistency ($\alpha = .98$) in the present study.

Procedures

Before data were collected, the study was approved by the university's Human Subjects Research and Review Committee. Students participated in the study as either part of a course requirement or they were given course extra credit for participation. Data were collected by research assistants in small group settings of six to eight students in a large seminar room. The research assistants were students in a Clinical Psychology Ph.D. program who were trained by the first author in the areas of data collection, questionnaire and interview techniques, clinical research ethicality, suicide risk and warning signs, and crisis intervention techniques in response to suicidal crises.

During each data collection session, research assistants first obtained written informed consent. After consent, research assistants distributed a packet of questionnaires to participants. The questionnaire packet took between 20 to 30 minutes to complete. Upon completion of the questionnaires, research assistants provided a debriefing form to participants that discussed the purpose of the study and gave contact information for available mental health resources. For each data collection session, a licensed clinical psychologist was available for crisis management—in an office down the hallway—in the event that a participant needed care. No participants utilized this service.

Data analyses

Data were entered into, and analyzed via, SPSS v26. Data analyses were conducted, and are presented below, in three steps. First, descriptive statistics were analyzed. Second, bivariate associations among the variables were assessed through Pearson correlation coefficients. Finally, two hierarchical multiple regressions of suicidal ideation were conducted according to Aiken and West (1991) to assess the moderating influences of coping competence and hopelessness.

Results

Table 1 shows the means and standard deviations for the major variables in the study along with the correlations between these variables. The means were within the expected ranges. As expected, coping competence was strongly negatively associated with depression, perceived burdensomeness, and suicidal ideation; and hopelessness, perceived burdensomeness, depression, and suicidal ideation were strongly positively intercorrelated.

As shown in Table 2, the hierarchical multiple regressions of suicidal ideation examined the influence of each predictor variable while controlling for depression; the amount

Table 1 Means, standard deviations and correlations between variables

	Burdensomeness	Coping Competence	Hopelessness	Depression	<i>M (SD)</i>
Burdensomeness	–	–.70*	.64*	.63*	2.6 (1.3)
Coping Competence	–.70*	–	–.66*	–.69*	13.8 (2.1)
Hopelessness	.64*	–.66*	–	.66*	2.6 (3.1)
Depression	.63*	–.69*	.66*	–	9.5 (9.1)
Suicidal Ideation	.63*	–.62*	.54*	.61*	9.2 (18.0)

* $p < .0001$ **Table 2** Hierarchical multiple regression analyses of suicidal ideation

Predictors	β	<i>t</i>	R^2 change
Model 1			
Step 1			.44***
Depression	.34	5.4***	
Coping Competence	–.39	–6.2***	
Step 2			.05***
Depression	.26	4.1***	
Coping Competence	–.23	–3.4***	
Burdensomeness	.30	4.8***	
Step 3			.02**
Depression	.25	4.1***	
Coping Competence	–.18	–2.6**	
Burdensomeness	.17	2.2*	
Coping Competence X Burdensomeness	–.22	–3.2***	
Model 2			
Step 1			.40***
Depression	.44	7.1***	
Hopelessness	.25	4.0***	
Step 2			.07***
Depression	.31	5.0***	
Hopelessness	.10	1.6	
Burdensomeness	.37	6.0***	
Step 3			.02**
Depression	.30	4.9***	
Hopelessness	.06	1.0	
Burdensomeness	.25	3.5***	
Hopelessness X Burdensomeness	.19	2.9*	

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

of variance that perceived burdensomeness contributed to suicidal ideation above and beyond the other predictors; and the interactions between perceived burdensomeness and the cognitive variables in predicting suicidal ideation. Coping competence, hopelessness, and perceived burdensomeness were centered for the analyses. In the first analysis, coping competence and perceived burdensomeness were significant independent predictors of ideation; perceived burdensomeness significantly contributed a unique amount of variance

to ideation; and the interaction of coping competence and perceived burdensomeness significantly predicted ideation. In the second analysis, hopelessness and perceived burdensomeness were significant predictors of ideation; perceived burdensomeness significantly contributed a unique amount of variance to ideation; and the interaction between hopelessness and perceived burdensomeness significantly predicted ideation.

To examine the form of the interactions, we plotted them in accordance with the recommendations by Aiken and West (1991). These are depicted in Figs. 1 and 2. “High” equals 1 standard deviation above the mean for the given variable; “medium” equals the mean; and “low” equals 1 standard deviation below the mean. As seen in Fig. 1, students with high burdensomeness and low coping competence reported greater suicidal ideation than students with high burdensomeness and high coping competence. As seen in Fig. 2, students with high burdensomeness and high hopelessness reported greater suicidal ideation than those with high burdensomeness and low hopelessness. Overall, our moderation analyses provide strong support for our hypotheses that coping competence and hopelessness moderate the relationships between perceived burdensomeness and suicidal ideation.

Discussion

As mentioned earlier, although previous research has examined the predictive value of perceived burdensomeness in studies of suicidal ideation in college students, very little research has examined how perceived burdensomeness *interacts* with cognitive variables in predicting suicidal ideation in college students. The present study thus extends this scant literature as we found strong evidence that the relationship between perceived burdensomeness and suicidal ideation in college students is moderated by coping competence and hopelessness. In addition, we found strong associations between coping competence, hopelessness, perceived burdensomeness, and suicidal ideation. Furthermore, when controlling for depression, coping competence and hopelessness, we found that perceived burdensomeness had a significant influence on suicidal ideation above and beyond the

Fig. 1 Coping competence moderates the relationship between burdensomeness and suicidal ideation

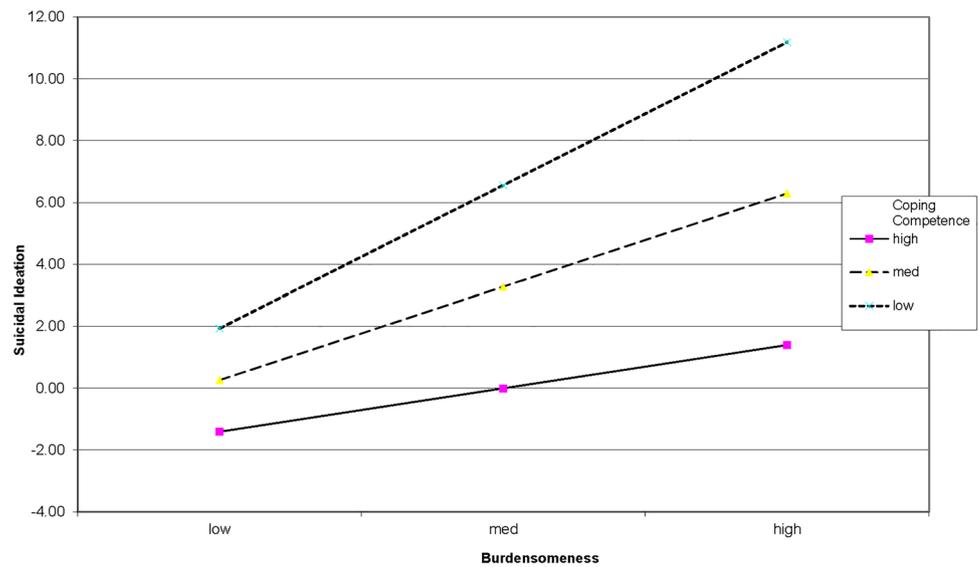
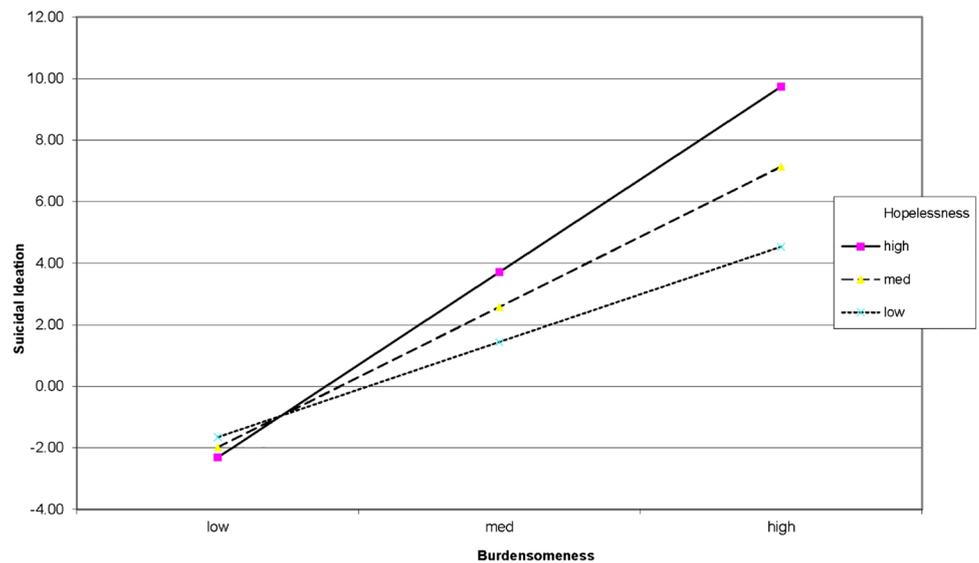


Fig. 2 Hopelessness moderates the relationship between burdensomeness and suicidal ideation



influence of these variables. Finally, to our knowledge, our study is the first to examine the concept of coping competence within the interpersonal theory of suicide framework.

Stressors associated with the rapid developmental trajectory experienced by many college students may increase their vulnerability for mental health difficulties. For example, transitioning from dependence to autonomy (while possibly moving away from home) may lead to feelings of instability and reduced emotional support from family and long-time friends, and some students may have difficulty in forming new relationships thus leading to social isolation and loneliness. Additionally, students may struggle with more intensive academic curricula, which may increase stress related to academic success and career-related issues. Students may also have to balance academic and job

responsibilities which, in turn, may lead to financial stress. Students may experience physical and mental exhaustion from being overwhelmed by the transitional stressors.

It may be the case that the stress that emanates from such stressors exacerbates one's risk for depression (Kroshus et al., 2020) and hopelessness, increases one's perception of self as incompetent, and increases one's sense that she or he is a burden on others. The experience of these, in turn, may increase one's risk for suicidal thoughts. Previous research indeed provides evidence for the deleterious effects of these transitional stressors on college students. For example, in a sample of undergraduate college students from four large universities in the United States (Westefeld et al., 2005), every student who attempted suicide ($n = 93$) cited stress related to school, family problems, and trouble with

relationships as primary reasons contributing to their suicide attempt. Moreover, 78% of students who attempted suicide reported financial stress as a primary reason contributing to their suicide attempt and 76% reported social isolation as a primary reason contributing to their attempt.

Clinical implications

Our study has important implications for the prevention, assessment, and treatment of suicidal thoughts and behavior in college students. First, our theoretical framework and findings identify coping competence and hopelessness as ideal targets for interventions as changes in these variables may modify the association between perceived burdensomeness and suicidal ideation. In specific, for a college student seriously considering suicide who perceives oneself as an extreme burden on others, enhancing the student's sense of coping competence could reduce her or his level of suicidal ideation and, in turn, reduce her or his risk for attempting suicide. Similarly, for a student suffering from burdensomeness and ideation, increasing the student's sense of hopefulness could reduce the severity of her or his suicidal thoughts and behavior. Second, because the moderators we examined are cognitive variables, our findings are especially relevant for cognitive and cognitive-behavioral interventions, which utilize cognitive strategies to combat suicidal thoughts and behavior (Hovey et al., 2014b).

Unfortunately, a number of factors may make effective suicide prevention and interventions for college students difficult to achieve. The inherent nature of burdensomeness may present itself as an obstacle towards treatment. In other words, college students may be hesitant to reach out for help as they may be particularly sensitive to perceiving any type of reaching out for assistance as an inappropriate demand on others—i.e., being a burden (Servaty-Seib et al., 2021). Moreover, up to three-fourths of college students may be unaware of available campus resources for dealing with suicide (Westefeld et al., 2005). Because being unaware of mental health resources has been shown (Ogueji & Okoloba, 2022) to exacerbate mental health difficulties, outreach to students is imperative. For example, information about campus resources for mental health and suicide can be distributed as part of the information packet given to students during college orientation sessions. Colleges and universities can also use electronic communications, social media, and an online presence as means of keeping students abreast of mental health services and suicide prevention programs that are available within the campus setting, surrounding communities, and nationally (e.g., the 988 suicide and crisis lifeline newly available within the United States). Such widespread messaging may help to destigmatize the seeking of mental health assistance. Finally, in the effort to curb suicide behavior in college students, college and

university counseling centers should include an assessment of perceived burdensomeness, hopelessness, and sense of coping competence as part of their screening protocols and they should provide crisis intervention training to staff that covers the critical roles that these variables play in determining suicide risk in college students. The provision of training should also be considered for other individuals who may have the opportunity to intervene in the welfare and functioning of students. These include student health center staff, residence hall staff, and other student affairs personnel.

As we navigate through the tail-end of the COVID-19 pandemic, it is important to consider how the pandemic has influenced college students' psychological functioning. Longitudinal research (Huckins et al., 2020; Mack et al., 2021) that tracked the mental health of college students in the United States found that, during the first month of the pandemic, students reported an increase in anxiety and depression and that these increases were linked to an increase in social isolation. Over the next two months, these same students reported a continued increase in social isolation, which remained linked to anxiety and depression. Moreover, during this latter period, students sensing COVID fatigue reported greater anxiety and depression. Given that social isolation appeared to drive these increases in anxiety and depression, it would not be surprising if hopelessness, burdensomeness, and suicidal ideation in college students were similarly affected.

Research on the psychological impact of COVID-19 on college students *after* the reopening of schools suggests that the pandemic has had a lingering negative influence on college student mental health. For example, continued social isolation (as measured by self-quarantine and quarantine of classmates) and increased financial stressors (as measured by the degree to which the pandemic influenced family economic status) were significantly associated with anxiety and depression in college students from five universities across China (Ren et al., 2021). Moreover, students closer to graduation reported greater anxiety and depression, thus suggesting that missing school may have intensified academic and career-related stress experienced by senior-level students.

Limitations and recommendations for future research

Limitations of our study include its self-report methodology and cross-sectional design. Although the perceived burdensomeness subscale from the SCS has been used by other researchers (e.g., Jahn et al., 2011; Slee et al., 2008a, b) and its internal consistency is sound, future research should use a more comprehensive measure of burdensomeness to fully ensure that the construct is thoroughly assessed. Finally, future research should assess the replicability and generalizability of our findings and examine whether additional

cognitive variables serve as moderators in the relationship between burdensomeness and suicidal thoughts and behaviors.

Data availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval This study was approved by The University of Toledo's Human Subjects Research and Review Committee and it was conducted in accordance with the 1964 Helsinki Declaration.

Consent to participate Written informed consent was obtained from all participants.

Consent to publish Participants were provided informed consent regarding publishing their data.

Conflict of interest/Competing interests We have no conflicts of interest to disclose and no competing interests to disclose.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications.
- American College Health Association. (2021). *National College Health Assessment III, undergraduate student reference group: Executive summary fall 2020*. American College Health Association.
- Becker, S. P., Foster, J. A., & Luebbe, A. M. (2020). A test of the interpersonal theory of suicide in college students. *Journal of Affective Disorders, 260*, 73–76. <https://doi.org/10.1016/j.jad.2019.09.005>
- Beck, A. T., & Steer, R. A. (1988). *Manual for Beck hopelessness inventory*. Psychological Corporation.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck depression inventories-IA and-II in psychiatric outpatients. *Journal of Personality Assessment, 67*, 588–597. https://doi.org/10.1207/s15327752jpa6703_13
- Bhargav, M., & Swords, L. (2022). Role of thwarted belongingness, perceived burdensomeness and psychological distress in the association between adverse childhood experiences and suicidal ideation in college students. *BJPsy Open, 8*, 1–7. <https://doi.org/10.1192/bjo.2021.1087>
- Buitron, V., Hill, R. M., & Pettit, J. W. (2017). Mindfulness moderates the association between perceived burdensomeness and suicide ideation in adults with elevated depressive symptoms. *Suicide and Life-threatening Behavior, 47*, 580–588. <https://doi.org/10.1111/sltb.12314>
- Carmody, D. P. (2005). Psychometric characteristics of the Beck depression inventory-II with college students of diverse ethnicity. *International Journal of Psychiatry in Clinical Practice, 9*, 22–28. <https://doi.org/10.1080/13651500510014800>
- Chang, E. C., Change, O. D., Martos, T., & Sallay, V. (2017). Future orientation and suicide risk in Hungarian college students: Burdensomeness and belongingness as mediators. *Death Studies, 41*, 284–290. <https://doi.org/10.1080/07481187.2016.1270371>
- Choi, B., & Bae, S. (2020). Suicide ideation and suicide attempts of undergraduate students in South Korea: Based on the interpersonal psychological theory of suicide. *Children and Youth Services Review, 117*, 1–7. <https://doi.org/10.1016/j.childyouth.2020.105282>
- Cole, A. B., Wingate, L. R., Sligh, M. L., Tucker, R. P., Hollingsworth, D. W., & O'Keefe, V. M. (2013). Burdensomeness, depression, and suicide in a sample of American-Indian college students. *Ethnicity and Inequalities in Health and Social Care, 6*, 77–86. <https://doi.org/10.1108/EIHC-10-2013-0026>
- Heron, M. (2019). Deaths: Leading Causes for 2017. *National Center for Health Statistics, National Vital Statistics Reports, 68*.
- Hill, R. M., & Pettit, J. W. (2014). Perceived burdensomeness and suicide-related behaviors in clinical samples: Current evidence and future directions. *Journal of Clinical Psychology, 70*, 631–643. <https://doi.org/10.1002/jclp.22071>
- Hollingsworth, D. W., Cole, A. B., O'Keefe, V. M., Tucker, R. P., Story, C. R., & Wingate, L. R. (2017). Experiencing racial microaggressions influences suicide ideation through perceived burdensomeness in African Americans. *Journal of Counseling Psychology, 64*, 104–111. <https://doi.org/10.1037/cou0000177>
- Hovey, J. D., Hurtado, G., Morales, L. R. A., & Seligman, L. D. (2014a). Religion-based emotional social support mediates the relationship between intrinsic religiosity and mental health. *Archives of Suicide Research, 18*, 376–391. <https://doi.org/10.1080/13811118.2013.833149>
- Hovey, J. D., Hurtado, G., & Seligman, L. D. (2014b). Findings for a CBT support group for Latina farmworkers in western Colorado. *Current Psychology, 33*, 271–281. <https://doi.org/10.1007/s12144-014-9212-y>
- Hovey, J. D., & King, C. A. (2002). The spectrum of suicidal behavior. In D. T. Marsh, & M. A. Fristad (Eds.), *Handbook of serious emotional disturbance in children and adolescents* (pp. 284–303). John Wiley & Sons.
- Huckins, J. F., DaSilva, A. W., Wang, W., Hedlund, E., Rogers, C., Nepal, S. K., Wu, J., Obuchi, M., Murphy, E. I., Meyer, M. L., Wagner, D. D., Holtzheimer, P. E., & Campbell, A. T. (2020). Mental health and behavior of college students during the early phases of the COVID-19 pandemic: Longitudinal smartphone and ecological momentary assessment study. *Journal of Medical Internet Research, 22*, 1–13. <https://doi.org/10.2196/20185>
- Jahn, D. R., Cukrowicz, K. C., Linton, K., & Prabhu, F. (2011). The mediating effect of perceived burdensomeness on the relation between depressive symptoms and suicide ideation in a community sample of older adults. *Aging and Mental Health, 15*, 214–220. <https://doi.org/10.1080/13607863.2010.501064>
- Joiner, T. (2005). *Why people die by suicide*. Harvard University Press.
- Kroskus, E., Hawrilenko, M., & Browning, A. (2020). Stress, self-compassion, and well-being during the transition to college. *Social Science and Medicine*. Advance online publication. <https://doi.org/10.1016/j.socscimed.2020.113514>
- Kwan, M. Y., Gordon, K. H., Carter, D. L., Minnich, A. M., & Grossman, S. D. (2014). An examination of the connections between eating disorder symptoms, perceived burdensomeness, thwarted belongingness, and suicide risk among undergraduate students. *Suicide and Life-threatening Behavior, 47*, 493–508. <https://doi.org/10.1111/sltb.12304>
- Lim, K. S., Wong, C. H., McIntyre, R. S., Wang, J., Zhang, Z., Tran, B. X., Tan, W., Ho, C. S., & Ho, R. C. (2019). Global lifetime and 12-month prevalence of suicidal behavior, deliberate self-harm and non-suicidal self-injury in children and adolescents between 1989 and 2018: A meta-analysis. *International Journal of Environmental Research and Public Health, 16*, 1–26. <https://doi.org/10.3390/ijerph16224581>
- Liu, C. H., Stevens, C., Wong, S. H. M., Yasui, M., & Chen, J. A. (2019). The prevalence and predictors of mental health diagnoses and suicide among U.S. college students: Implications for addressing disparities in service use. *Depression and Anxiety, 36*, 8–17. <https://doi.org/10.1002/da.22830>

- Ma, J., Batterham, A. L., Calear, A. L., & Han, J. (2016). A systematic review of the predictions of the interpersonal-psychological theory of suicidal behavior. *Clinical Psychology Review, 46*, 34–45. <https://doi.org/10.1016/j.cpr.2016.04.008>
- Mack, D. L., DaSilva, A. W., Rogers, C., Hedlund, E., Murphy, E. I., Vojdanovski, V., Plomp, J., Wang, W., Nepal, S. K., Holtzheimer, P. E., Wagner, D. D., Jacobson, N. C., Meyer, M. L., Campbell, A. T., & Huckins, J. F. (2021). Mental health and behavior of college students during the COVID-19 pandemic: Longitudinal mobile smartphone and ecological momentary assessment study: Part II. *Journal of Medical Internet Research, 23*, 1–13. <https://doi.org/10.2196/28892>
- Ogueji, I. A., & Okoloba, M. M. (2022). Seeking professional help for mental illness: A mixed-methods study of Black family member in the UK and Nigeria. *Psychological Studies, 67*, 164–177. <https://doi.org/10.1007/s12646-022-00650-1>
- O'Keefe, V. M., Wingate, L. R., Tucker, R. P., Rhoades-Kerswill, S., Slish, M. L., & Davidson, C. L. (2014). Interpersonal suicide risk for American Indians: Investigating thwarted belongingness and perceived burdensomeness. *Cultural Diversity and Ethnic Minority Psychology, 20*, 61–67. <https://doi.org/10.1037/a0033540>
- Rasmussen, K. A., Slish, M. L., Wingate, L. R., Davidson, C. L., & Grant, D. M. (2012). Can perceived burdensomeness explain the relationship between suicide and perfectionism? *Suicide and Life-Threatening, 42*, 121–128. <https://doi.org/10.1111/j.1943-278X.2011.00074.x>
- Rasmussen, K. A., & Wingate, L. R. (2011). The role of optimism in the interpersonal-psychological theory of suicidal behavior. *Suicide and Life-Threatening Behavior, 41*, 137–148. <https://doi.org/10.1111/j.1943-278X.2011.00022.x>
- Ren, Z., Xin, Y., Ge, J., Zhao, Z., Liu, D., Ho, R. C. M., & Ho, C. S. H. (2021). Psychological impact of COVID-19 on college students after school reopening: A cross-sectional study based on machine learning. *Frontiers in Psychology, 12*, 1–13. <https://doi.org/10.3389/fpsyg.2021.641806>
- Reynolds, W. M. (1991a). *Adult suicidal ideation questionnaire: Professional manual*. Psychological Assessment Resources.
- Reynolds, W. M. (1991b). Psychometric characteristics of the adult suicidal questionnaire in college students. *Journal of Personality Assessment, 56*, 289–307. https://doi.org/10.1207/s15327752jpa5602_9
- Ribeiro, J. D., Huang, X., Fox, K. R., & Franklin, J. C. (2018). Depression and hopelessness as risk factors for suicide ideation, attempts and death: Meta-analysis of longitudinal studies. *British Journal of Psychiatry, 212*, 279–286. <https://doi.org/10.1192/bjp.2018.27>
- Rudd, M. D. (2004). Rethinking hopelessness and suicide [Keynote address]. The American Association of Suicidology Annual Conference, Miami, FL.
- Schroder, K. E. E. (2004). Coping competence as predictor and moderator of depression among chronic disease patients. *Journal of Behavioral Medicine, 27*, 123–145. <https://doi.org/10.1023/B:JOBM.0000019848.84779.a9>
- Schroder, K. E. E., & Ollis, C. L. (2013). The coping competence questionnaire: A measure of resilience to helplessness and depression. *Motivation and Emotion, 37*, 286–302. <https://doi.org/10.1007/s11031-012-9311-8>
- Seo, J. (2020). Thwarted belongingness and perceived burdensomeness in Korean college students: Psychometric properties and cultural considerations for the interpersonal needs questionnaire-10. *Death Studies, 44*, 261–269. <https://doi.org/10.1080/07481187.2018.1541938>
- Servaty-Seib, H. L., Williams, P., & Liew, C. H. (2021). Interpersonal and intrapersonal predictors of suicidal thoughts and actions in first-year college students. *Journal of American College Health*. Advance online publication. <https://doi.org/10.1080/07448481.2021.1904950>
- Slee, N., Garnefski, N., Spinhoven, P., & Arensman, E. (2008a). The influence of cognitive emotion regulation strategies and depression severity on deliberate self-harm. *Suicide and Life-Threatening Behavior, 38*, 274–285. <https://doi.org/10.1521/suli.2008.38.3.274>
- Slee, N., Garnefski, N., van der Leeden, R., Arensman, E., & Spinhoven, P. (2008b). Cognitive-behavioral intervention for self-harm: Randomized control trial. *British Journal of Psychiatry, 192*, 202–211. <https://doi.org/10.1192/bjp.bp.107.037564>
- Steed, L. (2001). Further validity and reliability evidence for Beck hopelessness scale scores in a nonclinical sample. *Educational and Psychological Measurement, 61*, 303–316. <https://doi.org/10.1177/00131640121971121>
- Steer, R. A., & Clark, D. A. (1997). Psychometric characteristics of the Beck depression inventory-II with college students. *Measurement and Evaluation in Counseling and Development, 30*, 128–136. <https://doi.org/10.1080/07481756.1997.12068933>
- Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2008). Suicide desire and the capability for suicide: Tests of the interpersonal-psychological theory of suicidal behavior among adults. *Journal of Consulting and Clinical Psychology, 76*, 72–83. <https://doi.org/10.1037/0022-006X.76.1.72>
- Westefeld, J. S., Homaifar, B. H., Spotts, J., Furr, S., Range, L., & Werth, J. L. (2005). Perceptions concerning college student suicide: Data from four universities. *Suicide and Life-Threatening Behavior, 35*, 640–645. <https://doi.org/10.1521/suli.2005.35.6.640>
- Wong, Y. J., Koo, K., Tran, K. K., Chiu, Y., & Mok, Y. (2011). Asian American college students' suicide ideation: A mixed-methods study. *Journal of Community Psychology, 58*, 197–209. <https://doi.org/10.1037/a0023040>
- World Health Organization (2019). *Suicide: One person dies every 40 seconds* [News release]. Retrieved November 22, 2022 from www.who.int/news/item/09-09-2019-suicide-one-person-dies-every-40-Seconds
- Zhang, Z., Lester, D., Zhao, S., & Zhou, C. (2013). Suicidal ideation and its correlates: Testing the interpersonal theory of suicide in Chinese students. *Archives of Suicide Research, 17*, 236–241. <https://doi.org/10.1080/13811118.2013.805643>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.