




Risk and protective factors associated with hopelessness among Canadian postsecondary students

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Abstract

Hopelessness has been linked to several negative mental health outcomes among young adults and the prevalence of it has increased in recent years. The aim was to identify factors associated with hopelessness among Canadian postsecondary students using a socio-ecological model as a framework. A set of factors for investigation were identified using previously published literature and proxy questions from the American College Health Association's National College Health Assessment II ($n=48,584$). A multivariable logistic regression model was fitted to examine these potential associations. Overall, modifiable factors such as belonging to a community, general health, academic performance, and life stressors were found to be associated with hopelessness. In contrast, hopelessness was also associated with some negative health outcomes: loneliness, depression, and suicide ideation. The findings provide preliminary evidence for integrating hope into well-being programming and campus-based interventions aimed at improving postsecondary student mental health.

Keywords Hope · Mental health · University students · Campus · Higher education

Background

The American College Health Association (ACHA) has used the National College Health Assessment II (NCHA-II) survey to gather data from North American postsecondary students concerning their health behaviors from 2008 until 2022 (American College Health Association, 2022). Data collected through this survey have shown increasing trends among students experiencing hopelessness from 46% in 2009 to 66% in 2022 (American College Health Association, 2019, 2022). This statistic supports previous research using the Beck hopelessness scale, which found a rising trend in hopelessness among students in the USA and worldwide (Beck et al., 1974; Lester, 2013). Hopelessness is often comorbid with several undesirable outcomes such as suicidal ideation, suicide, substance misuse,

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anxiety, depression, and poor academic performance, all of which magnify the significance of this issue (Chang, 2017; Heisel et al., 2003; Jalilian et al., 2014; Lisnyj et al., 2020; Viñas Poch et al., 2004).

Snyder defines hope as “the process of thinking about one’s goals along with the motivation to move toward those goals (agency) and the ways to achieve those goals (pathways)” (Snyder et al., 2002). Despite our current understanding of hope, hopelessness continues to be thought of as a byproduct of unfavorable circumstances or mental illness (Hewitt et al., 2014). However, some research has found hope itself is a malleable construct that can improve a person’s overall mental health (Cheavens et al., 2006; Snyder et al., 2002). Among students experiencing periods of hopelessness, those who had high hope were far less likely to have suicidal ideation during a time of crisis compared to those who had low hope (Chang, 2017). Further research also suggests facilitating hopefulness in college students may be an effective method of discouraging the development of suicidal thoughts (Range & Penton, 1994). These findings, along with Snyder’s contributions (Snyder, 2002; Snyder et al., 2002), suggest that great improvements can be made to post-secondary students’ quality of life by promoting hopefulness instead preventing or treating adverse events caused in part by hopelessness.

There are several common comorbid conditions that have been associated with hopelessness such as loneliness, anxiety, overwhelming stress, and fatigue (Lisnyj et al., 2020; Pompili et al., 2010). In fact, some of these psychopathological dimensions are linked to immune-inflammatory alterations, and these inflammatory markers are associated with negative clinical mental health outcomes (Serafini et al., 2020). This suggests a possible cascading phenomenon may be present and understanding antecedents of hopelessness may elucidate more upstream approaches to protect well-being. Additionally, some of these comorbid conditions are closely linked to emotions, which presents a set of challenges for researchers in Canada. Expression of emotion and what is viewed as normal differs between cultures (Safdar et al., 2009). What may appear as a strong predictor of hopelessness in one context may not necessarily manifest the same in another context. Furthermore, research has shown that the prevalence of mental health disorders varies greatly between cultures (Hofmann et al., 2010) suggesting that social constructs play a role in prevalence of these disorders, while also providing further justification for the need to explore factors in a Canadian context.

While hopelessness has steadily increased in the last 12 years, debilitating depression, anxiety, mental exhaustion, loneliness, and stress varied among postsecondary students (American College Health Association, 2019). Evidence indicates that some of the peak onset of mental health disorders overlaps with the age most young adults choose to pursue higher education (Kessler et al., 2007a, 2007b), suggesting a possible synergistic effect which may present itself in many postsecondary students (Reavley & Jorm, 2010). International studies have found that lifelong prevalence and age of onset can vary greatly between countries as well, providing further justification for the need to gather data in a Canadian context (Kessler et al., 2007a, 2007b).

Previous research shows individual actions greatly affect one’s perceived mental health, and those who are more physically active may experience a protective effect due to the number of social interactions they have while exercising (Taliaferro et al., 2009). This advances the findings that proposed mental health disorders cluster among health risk behavior groups. The observed associations between mental health disorders and infrequent exercise, poor diet, and frequent drug and alcohol use provide a target for upstream interventions that may greatly improve the mental health of high-risk behavior groups (Vermeulen-Smit et al., 2015). The current literature surrounding hope therapy has shown

that instilling hope in an individual can improve a person's well-being, while reducing their symptoms of distress (Gallagher & Lopez, 2018). This may also suggest that if a person can be lifted from an environment of hopelessness and placed into a more supportive setting, their interactions within the new community can also aid their recovery.

Rationale and Objectives

To our knowledge, no research to-date has examined risk and protective of hopelessness among Canadian postsecondary students. Considering that existing research shows the increasing prevalence of hopelessness (American College Health Association, 2019, 2022), finds evidence of hope as potentially being protective of mental health (Chang, 2017; Range & Penton, 1994) and even promoting well-being (Cheavens et al., 2006), an in-depth investigation of the possible risk and protective factors of hopelessness among university and college students could be useful in identifying campus-based interventions as well as individual-level supports for this priority group. This would fill a gap in the literature and further our understanding to find areas for further investigation and intervention.

Thus, the primary objective of this study is to use data collected from the ACHA which includes nearly 49,000 students across 58 Canadian postsecondary institutions to identify various risk and protective factors associated with hopelessness among postsecondary students. A secondary objective is to apply the socioecological model as a guiding framework to frame recommendations that postsecondary institutions can use in developing upstream, targeted interventions to increase hope among Canadian postsecondary students. We hypothesize that negative mental health outcomes will be statistically significantly associated with experiencing hopelessness. We also hypothesize that individuals without social support and lower academic performance will be more likely to experience hopelessness.

Methods

Study Design and Survey Instrument

We used a cross-sectional study design of self-reported data collected from 55,284 respondents across 58 Canadian postsecondary institutions from the Canadian NCHA-II online survey. Of these, 52 were public institutions and 6 were private. The NCHA-II is a nationally recognized survey conducted throughout North America. The survey aims to gather data about the students' behaviors, health habits, and perceptions. The survey has been previously tested for its validity and reliability (American College Health Association, 2019). The mean response rate across institutions was 20%.

The spring 2019 NCHA-II survey was conducted entirely online using a random sample from each participating institution via emails sent directly to students' institutional email addresses. The research team was granted access to the secondary use of this data for the purposes of this investigation.

Framework

It is challenging to comprehensively discuss complex issues such as mental health without the inclusion of a framework. One such framework is the Centre for Disease Control's

(CDC) socioecological model which categorizes risk and protective factors into four levels (Centers for Disease Control and Prevention, 2020). This socioecological model consists of four nested categories at the individual, relationship, community, and societal levels. This model recognizes that many determinants can influence individuals' mental health. As such, determinants in multiple cascading categories should be considered simultaneously. Previous literature has found that it is beneficial to have an interdisciplinary approach when dealing with mental health problems in society for this exact reason (McLaughlin, 2011). While this specific study only addressed depression, others have established a positive association between hopelessness and depression, while also providing evidence for the mitigating effects of social support (Lamis et al., 2016).

Respondents

Only respondents aged 18–30 were eligible for analysis to make the findings applicable to the typical student demographic. This resulted in 48,874 responses being eligible for inclusion in the subsequent analysis. Sex, gender, and gender identity were evaluated over three questions. If the respondents' sex and gender aligned, and did not identify as transgender, they were categorized into their respective cisgender categories. If respondents identified as transgender or their biological sex and gender identity did not align, they were categorized as non-binary. If respondents skipped any of these three questions, they were classified as missing and omitted from the analysis.

Variables of Interest

The outcome of interest was whether students self-reported experiencing hopelessness in the past year. The NCHA-II survey question had five response options: (i) no, never; (ii) no, not in the last 12 months; (iii) yes, in the last 2 weeks; (iv) yes, in the last 30 days; and (v) yes, in the last 12 months. We dichotomized the variable of students experiencing hopelessness any time within the last 12 months (i.e., have not felt hopeless in the last 12 months vs. have left hopeless within the last 12 months).

Next, we identified potential risk and protective factors a priori based on previous research that indicated factors contributing to hopelessness (Jalilian et al., 2014; Nicpon et al., 2006; Stevens et al., 2018). This resulted in a total of 14 explanatory variables in our analysis. Specifically, these included 4 sociodemographic variables, 3 academic and social related variables, and 7 mental health-related variables. The categorization of these variables can be seen in Table 1. Proxy questions and response options used in this study are provided in the Online Resource.

Based on the socioecological model, we examined factors at the individual, relationship, community, and societal levels. Under the individual level, we examined the associations between hopelessness and sex, age, race, suicidal ideation, suicide attempts, diagnoses of depression, stress, and chronic illness. At the relationship level, we examined the relationship between hopelessness, loneliness, and participation in athletics. At the community level, cumulative grade point average and academic stress were selected as proxies for risk factors within the institution's control. These factors were selected to observe the association between stress imposed by universities and how this affects hope. Living accommodations and a sense of belonging to a community were also assessed to gauge how a student's surroundings contribute to or protect them from feelings of hopelessness. At the societal

Table 1 Descriptive statistics from selected variables used in the analysis of Canadian students from the National College Health Assessment II 2019 survey

Variable	Respondents (<i>n</i>)	Respondents (%)
Hopelessness		
No, not in the last 12 months	16,740	34.6
Yes, in the last 12 months	31,679	65.4
Living accommodations		
Campus or residence hall	5884	12.1
Fraternity or sorority house	83	0.2
Other college/university housing	1013	2.1
Parent/guarding home	17,252	35.5
Other off-campus housing	19,772	40.7
Other	4561	9.4
Cumulative GPA		
A	18,059	37.2
B	21,547	44.4
C	7309	15.0
D/F	692	1.4
N/A	889	1.8
Sex and gender		
Male	14,413	29.5
Female	32,933	67.4
Non-binary	1308	2.7
Self-identified as Indigenous		
Yes	2035	4.2
No	46,819	95.8
Self-identified as Caucasian		
Yes	28,658	58.9
No	20,196	41.1
General health		
Excellent	4658	9.7
Very good	15,063	31.4
Good	17,111	35.7
Fair	8955	18.7
Poor	1756	3.7
Don't know	395	0.8
Belonging to a community		
Never	4293	12.6
Once or twice	4816	14.1
About once a week	4229	12.4
About 2 or 3 times a week	6953	20.4
Almost everyday	8583	25.2
Everyday	5254	15.4
Academic stress		
No	18,747	38.9
Yes	29,484	61.1

Table 1 (continued)

Variable	Respondents (<i>n</i>)	Respondents (%)
Relationship stress		
No	31,835	65.7
Yes	16,592	34.3
Financial stress		
No	27,509	57.0
Yes	20,804	43.0
Seriously considered suicide		
No, never	31,690	65.5
No, not in the last 12 months	8388	17.3
Yes, in the last 2 weeks	1821	3.8
Yes, in the last 30 days	1417	2.9
Yes, in the last 12 months	5089	10.5
Attempted suicide		
No, never	41,455	85.7
No, not in the last 12 months	5464	11.3
Yes, in the last 2 weeks	274	0.6
Yes, in the last 30 days	161	0.3
Yes, in the last 12 months	1007	2.1
Depression		
No	36,986	76.7
Yes	11,236	23.3
Loneliness		
No, never	6498	13.4
No, not in the last 12 months	7247	15.0
Yes, in the last 2 weeks	15,819	32.7
Yes, in the last 30 days	7264	15.0
Yes, in the last 12 months	11,582	23.9

level, there were no appropriate proxy questions which would give us accurate conclusions on the Canadian population.

Statistical Analysis

We calculated descriptive statistics to view the distribution of all variables selected for inclusion. Collinearity was assessed using Pearson and Spearman's rank correlation test to assess for any highly correlated variables. If any variables were found to be highly correlated (i.e., ≥ 0.70), the most causally plausible variable of interest was selected for subsequent analysis. Univariable logistic regression models were fitted for each of the 14 variables to estimate unadjusted associations between independent variables and the outcome of interest using a significance level of $\alpha = 0.05$.

From this, a final multivariable logistic regression model was fitted using a stepwise backwards elimination approach. All statistically significant variables from the univariable analyses were introduced into the model (i.e., $p < 0.05$). These were sequentially removed until all remaining variables were significant. A likelihood ratio test was conducted

following the removal of each subsequent variable to assess the model fit. If the test was not significant ($p > 0.05$), the variable was successfully removed. Variables were reintroduced if these caused $\geq 20\%$ change in the coefficient of any significant variable upon removal, and if it was considered an explanatory antecedent or distorter variable given that it was also a non-intervening variable. Two-way interaction effects were tested based on biological plausibility and information from the literature, which resulted in one significant interaction term being included in the model: individuals who had a positive diagnosis of depression and those who identified as having financial stress in the last 12 months ($p < 0.05$).

The Hosmer–Lemeshow test was used to determine and confirm goodness-of-fit (Hosmer et al., 1997). Outliers were assessed using Pearson and deviance residuals, and no observations or covariates were removed from the analysis. Odds ratios (ORs), 95% confidence intervals (95% CI), and the resulting p values were estimated for each parameter. All statistical analyses were performed using StataSE 15.1 (StataCorp, College Station, Texas).

Ethical Approval

The original dataset involved anonymous collection and informed consent from all respondents, and the ACHA went through an independent Institutional Review Board process. We sought and received approval for the use of data from the participating institution (REB#[REDACTED]).

Results

Descriptive Statistics

Of the 48,419 respondents who answered the hopelessness question, 65.4% of them reported feeling hopeless within the last year. Most were females (71.6%), while only a small fraction identified as something other than cis-male or cis-female (2.7%). Most respondents (85.1%) were enrolled in undergraduate studies, with 26.7% and 23.5% being within their first and second year, respectively. More than one-third of the respondents reported living at a parent/guardian's home (35.5%), and more than another third reported living off-campus (40.7%). Regarding depression and suicide, 26.3% reported being diagnosed with depression and 17.6% reported seriously considering suicide in the last 12 months. Less than half of the respondents reported feeling a sense of belonging to a community almost every day in the last month (39.48%). Table 1 provides a descriptive breakdown of survey responses. Results from the univariable analyses are provided as supplementary information in the Online Resource.

Multivariable Regression Results

Relative to their referent groups, poor academic performance, poor general health, academic stress, financial stress, relationship stress, having seriously considered suicide, being diagnosed with depression, and loneliness all increased the odds of feeling hopeless (Table 2). Among these risk factors, an inverse association was observed between cumulative GPA, general health, and hopelessness. As cumulative GPA and general health rose, the odds of feeling hopeless decreased. A rising trend was again observed between

Table 2 Results of multivariable logistic regression between factors associated with hopelessness among Canadian postsecondary students

Variable	OR	<i>p</i> value	95% CI
Sex and gender			
Female	Referent		
Male	0.78	<0.001	0.73, 0.83
Non-binary	1.04	0.743	0.84, 1.28
Living accommodations			
Campus or residence hall	0.90	0.033	0.81, 0.99
Fraternity or sorority house	1.25	0.568	0.58, 2.70
Other college/university housing	0.96	0.664	0.78, 1.17
Parent/guarding home	Ref		
Other off-campus housing	0.86	<0.001	0.80, 0.92
Other	0.91	0.083	0.81, 1.01
Cumulative GPA			
A	Referent		
B	1.16	<0.001	1.09, 1.24
C	1.39	<0.001	1.252, 1.54
D/F	1.91	0.001	1.32, 2.77
N/A	1.16	0.257	0.90, 1.51
Self-identified as Indigenous			
No	Referent		
Yes	0.81	0.006	0.70, 0.94
Self-identified as Caucasian			
No	Referent		
Yes	0.75	<0.001	0.70, 0.80
General health			
Excellent	Referent		
Very good	1.26	<0.001	1.13, 1.40
Good	1.56	<0.001	1.40, 1.74
Fair	2.06	<0.001	1.82, 2.34
Poor	3.41	<0.001	2.55, 4.56
Don't know	3.28	<0.001	1.96, 5.48
Belonging to a community			
Never	Referent		
Once or twice	0.94	0.334	0.82, 1.07
About once a week	0.84	0.010	0.73, 0.96
About 2 or 3 times a week	0.79	<0.001	0.70, 0.89
Almost everyday	0.62	<0.001	0.55, 0.69
Everyday	0.47	<0.001	0.41, 0.53
Academic stress			
No	Referent		
Yes	2.18	<0.001	2.05, 2.33
Relationship stress			
No	Referent		
Yes	1.51	<0.001	1.41, 1.62
Financial stress			
No	Referent		
Yes	1.35	<0.001	1.26, 1.45

Table 2 (continued)

Variable	OR	<i>p</i> value	95% CI
Seriously considered suicide			
No, never	Referent		
No, not in the last 12 months	1.62	<0.001	1.48, 1.79
Yes, in the last 2 weeks	10.26	<0.001	6.78, 15.54
Yes, in the last 30 days	20.31	<0.001	11.16, 36.95
Yes, in the last 12 months	17.51	<0.001	13.43, 22.83
Attempted suicide			
No, never	Referent		
No, not in the last 12 months	0.69	<0.001	0.60, 0.78
Yes, in the last 2 weeks	0.17	<0.001	0.10, 0.31
Yes, in the last 30 days	0.28	0.010	0.11, 0.74
Yes, in the last 12 months	0.70	0.232	0.39, 1.26
Depression			
No	Referent		
Yes	1.46	<0.001	1.30, 1.63
Loneliness			
No, never	Referent		
No, not in the last 12 months	2.13	<0.001	1.90, 2.38
Yes, in the last 2 weeks	13.37	<0.001	11.93, 14.99
Yes, in the last 30 days	10.48	<0.001	9.28, 11.84
Yes, in the last 12 months	7.78	<0.001	6.98, 8.67
Financial stress and depression interaction			
Interaction term	0.83	0.022	0.70, 0.97

hopelessness and the last time a student felt lonely or seriously considered suicide. Relative to their referent groups, being Indigenous, White, living in residence, off-campus housing, a sense of belonging to a community, and having attempted suicide, reduced the odds of feeling hopeless (Table 2). Among these protective factors, an inverse relationship was once again observed between the frequency of feeling a sense of belonging to a community and feeling hopeless. As respondents felt a sense of belonging more frequently, their odds of reporting feeling hopeless greatly reduced. A protective association between having attempted suicide in the last 2 weeks, and within the last month was also observed as those who fell into these groups were at lower odds of reporting hopelessness.

Interactions

An individual who had a positive diagnosis of depression and financial stress were at greater odds of feeling hopeless compared to someone without depression or financial stress (OR = 1.63, $p < 0.05$, 95% CI: 1.44, 1.85). An individual who had a positive diagnosis of depression and financial stress was at greater odds of feeling hopeless than someone with financial stress alone (OR = 1.20, $p < 0.05$, 95% CI: 1.06, 1.36). A student with depression and no financial stress was at greater odds of feeling hopeless compared to someone without depression or financial stress (OR = 1.48, $p < 0.05$, 95% CI: 1.36, 1.46). A student with financial stress alone was significantly more likely to report feeling hopeless compared to a student with neither financial stress nor depression (OR = 1.36, $p < 0.05$,

95% CI: 1.26, 1.46). A person with a positive diagnosis of depression and financial stress was no more or less likely than a person with depression alone to feel hopeless. A person with depression compared to a person with just financial stress is also equally likely to feel hopeless. Results from the interactions are provided as supplemental information in the Online Resource.

Discussion

The discussion is framed using the socioecological model emphasizing the interconnected nature of independent variables and the outcome.

Individual Level Factors

Of the variables present in the final model, a diagnosis of depression, general health, sex, seriously considered suicide, and attempted suicide were associated with hopelessness. The odds of feeling hopeless in the last year were 20 times greater for individuals who had seriously considered suicide in the last 2 weeks compared to those who had never considered suicide. What might be puzzling to some is the odds of feeling hopeless were only 0.2 times as that for respondents who had attempted suicide in the last 2 weeks, compared to those who had never attempted suicide. This association was studied by a previous study which reported the second most common feeling following a suicide attempt was hopefulness (Chesley and Loring-McNulty, 2003). The observed association here may be, in part due to survival bias. It is worth noting that this protective factor also existed, but was not as strong, for those who had attempted suicide in the last month, and those who had attempted suicide within the last year, suggesting the protective association diminishes over time as the memory of the suicide attempt and the feelings proceeding it fade.

Suicidality was of particular interest to the research team, as its association with hopelessness was very strong. Understanding the complex relationship between hopelessness and suicide can help shape more effective intervention programs. If better interventions are implemented, the benefits may be observed in hopefulness, and reduced suicidality among students. According to the US Centers for Disease Control, awareness, intervention, and methodology are the cornerstones to an effective suicide prevention program (U.S. Public Health Services, 1999; U.S. Surgeon General, 2012). This theory is further validated by Chesley and Loring-McNulty (2003) who concluded the primary reason for not attempting suicide again among survivors was receiving treatment by a professional. Another study among suicidal patients found a short, patient-centered suicide intervention program with an emphasis on early therapeutic alliance could result in an 83% reduction in risk of suicide between treatment and control groups (Gysin-Maillart et al., 2016). In Canada, 55% of students in postsecondary institutions in 2019 reported not receiving information about suicide prevention from their school, despite 69.2% expressing interest in these resources (American College Health Association, 2019). Our study's findings suggest students who are feeling suicidal are at far greater odds of feeling hopeless and would benefit greatly from mental health services from a professional. However, access to these services continues to be a significant obstacle for many students for a variety of reasons, including long wait times, and social stigma associated with getting help (Giamos et al., 2017). Universities are an excellent setting for early interventions like information campaigns to raise awareness about suicide prevention to target upstream determinants that lead to

hopelessness. Most institutions have an excellent information dissemination network that may prove valuable in improving student welfare surrounding this.

Relationship Level Factors

Canadian postsecondary students who reported feeling adept at managing the daily responsibilities of life experienced significant protective effects against anxiety on their academic performance (Lisnyj et al., 2020). The same study also found a significant relationship between hopelessness and anxiety adversely affecting their academic performance, suggesting that instilling hope within students can serve as a protective factor against many adverse outcomes. Further research by Chang et al. (2019) observed a protective association between hopeful adults and anxious symptoms, suicidal ideations, and depressive symptoms. Their conclusion suggests hopefulness, in all instances, acts as a protective factor against adverse outcomes such as suicidal ideation (Chang et al., 2019). According to our findings, individuals who reported feeling lonely more frequently had a greater likelihood of feeling hopeless. Although loneliness is a relationship factor, it can be influenced by personal decisions, community decisions, and societal factors on many levels, which can either benefit or hinder the ability to improve this feeling. The intersectionality of many of these protective and risk factors lends further support to the importance of using the socioecological model which suggests targeting interventions at multiple levels to see the greatest improvements. We recommend universities promote programs, clubs, and sports on campus to help students find a group where they belong. These changes may reduce feelings of loneliness, which in turn may improve hopefulness.

Community Level Factors

Our findings suggest GPA was a strong predictor of hopelessness. Academic success is the most important achievement for a university student and failing to meet these goals results in a significant blow to their self-esteem (Pacht, 1984), and may explain the associations from our study. For some students, self-worth and academic success are highly correlated (Crocker et al., 2003), and one study found an inverse association between resiliency and hopelessness, while also finding a positive association between self-esteem and resiliency (Karatas & Cakar, 2011). A rising trend in perfectionism among college students has also been observed over the last two decades (Curran & Hill, 2019), which could result in more students feeling hopeless. The link between low self-esteem and hopelessness explains why students who are performing poorly in school may feel more hopeless than those performing well, especially those whose self-esteem is closely tied to their academic success (Crocker et al., 2003; Kulick & Wright, 2008; Schoon et al., 2007). Universities should reconsider how they deliver course material and how they assess students' understanding of concepts. A possible solution to this problem could be the use of recorded lectures. Researchers have found that students who attend lectures and supplement their learning by watching recordings of online lectures do significantly better on assessments that test their knowledge base, but not the higher-order thinking skills which require the application of knowledge (Bos et al., 2016). Further research has also found that for some students, who struggle to pay attention, online learning presents its own set of challenges (Loh et al., 2016). The results of these studies point benefits of hybrid learning that was generally not present in postsecondary institutions in Canada prior to the COVID-19 pandemic. We

recommend that postsecondary institutions consider the use of technology to allow students to identify pathways to achieving their academic goals.

One of the strongest protective factors against hopelessness is a sense of belonging to a community. The model suggests that compared to living at home, students living among other students feel a greater sense of community and, therefore, are less likely to feel hopeless. However, competing interests may mask this association. While living on campus is likely to increase the social interactions and protective bonds that students would experience, not all residences facilitate this equally. One study examined the association between residence design and factors including sense of belonging, quality of life, and agreeableness (Rodger & Johnson, 2005). They identified significant differences between students' sense of belonging to a community in suite-style residences versus traditional residences, with fewer common areas and more students (Rodger & Johnson, 2005). These findings strongly align with Shaikh and Deschamps' (2006) work which concluded some residence halls, while community-oriented, still leave much to be desired. Students living in university residences reported mental health issues, cultural shock, insomnia, problems with their diet, and a lack/difficulty of access to student health services as some of their greatest issues (Shaikh & Deschamps, 2006), which can all contribute to a sense of hopelessness. Residences are where students sleep, live, socialize, relax, and study. Similar research has shown that office design directly affects worker productivity, efficiency, health, and happiness (Brown et al., 2019; Ornstein, 2011; Ulrich et al., 2006). Recently, researchers observed that students in socially designed residences had better first semester GPA than those in isolation designed residences (Brown et al., 2019). This observation is relevant to our work because students with higher GPAs were less likely to feel hopeless than those who had lower GPAs, providing further justification for the importance of approaching hopelessness as an intersectional issue that should be examined as resulting from the combination of multiple risk factors acting simultaneously. Postsecondary institutions should recognize the importance of the student environment on their health and promote a positive atmosphere for learning and living.

Societal Factors

We were unable to identify societal factors from the original questionnaire for analysis. Since university students in different regions will have distinct societal factors which impact their mental health, it is likely that societal pressures affect hopelessness. One qualitative study centered on Canadian postsecondary student mental health resources found stigma around mental health continued to exist in society, but the topic was being discussed more in the postsecondary institutions (Giamos et al., 2017), with participants citing stigma as a barrier to accessing mental health resources. This student goes on to cite their university's counselling services being located at the end of a long hallway in the basement of their university center, making the commute down to the office a "walk of shame" (Giamos et al., 2017). Future work surrounding this topic should explore and identify societal pressures on mental health, or simply focus on the individual environment within each institution to best address areas of improvement to make findings and recommendations applicable to those settings and regions.

Limitations

This study used data from a large national sample across 58 Canadian postsecondary institutions using validated and reliable data collection instruments. However, there were some limitations in this study. First, our investigation used a cross-sectional study design, and therefore, we were unable to establish any causal or temporal relationships. While logistic regression can identify associations between independent variables of interest and the dependent variable, the causal pathway was not elucidated since associations may be bidirectional. Statistically significant associations identified in this study must be verified using a longitudinal sample or ethically-sound experimental study designs (e.g., hope therapy). Additionally, there was a possibility of recall bias in this study because some questions asked about students' experiences dating back to the last 12 months. This may have resulted in differential misclassification of groups of students. Furthermore, approximately 82% of respondents had an A or B cumulative GPA, which is likely not representative of the general student population. The timing of data collection in April may have skewed the respondents. Future surveys can benefit from including multiple data collection periods or using survey weighting techniques to attempt to correct this. In our study particularly, hopelessness was measured as being present versus absent in the past year. Thus, our study cannot comment on the magnitude of hopelessness that postsecondary students experience, and we recommend future investigations examine whether the magnitude of hope (e.g., Likert scale) is increasingly associated with well-being. Lastly, we were concerned about non-response bias in the dataset because students who are very hopeless may lack the motivation to participate in a voluntary questionnaire or may have already dropped out of university due to their hopelessness. This group would have unintentionally been excluded from the analysis, and thus have masked potentially statistically significant associations, or move associations towards the null. Due to these reasons, the generalizability of the study findings is low despite the large sample size and these findings must be corroborated through other study designs and methods.

Conclusions

Based on the findings from this multivariable analysis, important modifiable factors such as a sense of belonging to a community, general health, academic performance, and life stressors were found to be associated with hopelessness. More importantly, hopelessness was associated with some negative mental health outcomes including loneliness, depression, and suicidal behavior, which supports our hypotheses. Therefore, hope may be a valuable trait or skill worth developing in the student population to protect against negative mental health outcomes and perhaps even bolster overall well-being.

Our study was intended to be exploratory rather than establish any causal or temporal links. Thus, more exploration of the magnitude of hopefulness using a scale and assessing its role as a mediator or moderator of other mental outcomes in this population is needed. Importantly, implementing some interventions of hope (e.g., hope therapy, well-being programs) to establish a temporal link would be useful for educators and well-being programming in determining whether programs and interventions aimed at students should emphasize hope. Our investigation serves as one of the first to map potential risk and protective of hopelessness. More qualitative and quantitative studies are needed to clarify the role of hope in student well-being and which causal pathways hopelessness acts on to impact mental health outcomes.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11469-023-01050-w>.

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Data Availability The report is available through the American College Health Association's repository here: https://www.acha.org/documents/ncha/NCHA-II_SPRING_2019_CANADIAN_REFERENCE_GROUP_DATA_REPORT.pdf. Raw data is available through the ACHA website upon reasonable request.

Declarations

Ethics Approval The American College Health Association granted permission to use their anonymized data for this work. Ethics approval for this study was received from the institutional Research Ethics Board where the research was completed (#19-01-024).

Informed Consent The American College Health Association granted permission and access the data for this work. Additional approval from the authors' institutional Research Ethics Board was received for this work (#19-01-024), in accordance with the ethical standards presented in the 1964 Declaration of Helsinki and its later amendments. All participants provided informed consent before completing the National College Health Assessment-II survey, and all data was collected anonymously.

Competing Interests The authors declare no competing interests.

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References

- American College Health Association. (2019). *Reference Group Executive Summary*. Retrieved from https://www.acha.org/NCHA/ACHA-NCHA_Data/Publications_and_Reports/NCHA/Data/Publications_and_Reports.aspx. Accessed 13 Nov 2022
- American College Health Association. (2022). *American College Health Association-National College Health Assessment III: Canadian Reference Group Data Report Spring 2022*. Retrieved from https://www.acha.org/documents/ncha/NCHA-III_SPRING_2022_CANADIAN_REFERENCE_GROUP_DATA_REPORT.pdf. Accessed 13 Nov 2022
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology*, 42(6), 861–865.
- Bos, N., Groeneveld, C., van Bruggen, J., & Brand-Gruwel, S. (2016). The use of recorded lectures in education and the impact on lecture attendance and exam performance. *British Journal of Educational Technology*, 47(5), 906–917.
- Brown, J., Volk, F., & Spratto, E. M. (2019). The hidden structure: The influence of residence hall design on academic outcomes. *Journal of Student Affairs Research and Practice*, 56(3), 267–283.

- Centers for Disease Control and Prevention. (2020). *The social-ecological model: A framework for prevention | violence prevention | injury center | CDC*. Retrieved from <https://www.cdc.gov/violenceprevention/publichealthissue/social-ecologicalmodel.html>. Accessed 13 Nov 2022
- Chang, E. C. (2017). Hope and hopelessness as predictors of suicide ideation in Hungarian college students. *Death Studies, 41*(7), 455–460.
- Chang, E. C., Chang, O. D., Martos, T., Sallay, V., Zettler, I., Steca, P., ... & Cardenoso, O. (2019). The positive role of hope on the relationship between loneliness and unhappy conditions in Hungarian young adults: How pathways thinking matters! *Journal of Positive Psychology, 14*(6), 724–733.
- Cheavens, J. S., Feldman, D. B., Gum, A., Michael, S. T., & Snyder, C. R. (2006). Hope therapy in a community sample: A pilot investigation. *Social Indicators Research, 77*(1), 61–78.
- Chesley, K., & Loring-McNulty, N. E. (2003). Process of suicide: Perspective of the suicide attempter. *Journal of the American Psychiatric Nurses Association, 9*(2), 41–45.
- Crocker, J., Karpinski, A., Quinn, D. M., & Chase, S. K. (2003). When grades determine self-worth: Consequences of contingent self-worth for male and female engineering and psychology majors. *Journal of Personality and Social Psychology, 85*(3), 507.
- Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin, 145*(4), 410.
- Gallagher, M. W., & Lopez, S. J. (Eds.). (2018). *The Oxford handbook of hope*. Oxford University Press.
- Giamos, D., Lee, A. Y. S., Suleiman, A., Stuart, H., & Chen, S.-P. (2017). Understanding campus culture and student coping strategies for mental health issues in five Canadian colleges and universities. *Canadian Journal of Higher Education, 47*(3), 136–151.
- Gysin-Maillart, A., Schwab, S., Soravia, L., Megert, M., & Michel, K. (2016). A novel brief therapy for patients who attempt suicide: A 24-months follow-up randomized controlled study of the Attempted Suicide Short Intervention Program (ASSIP). *PLOS Medicine, 13*(3), e1001968–e1001968.
- Heisel, M. J., Flett, G. L., & Hewitt, P. L. (2003). Social hopelessness and college student suicide ideation. *Archives of Suicide Research, 7*(3), 221–235.
- Hewitt, P. L., Caelian, C. F., Chen, C., & Flett, G. L. (2014). Perfectionism, stress, daily hassles, hopelessness, and suicide potential in depressed psychiatric adolescents. *Journal of Psychopathology and Behavioral Assessment, 36*(4), 663–674.
- Hofmann, S. G., Anu Asnaani, M. A., & Hinton, D. E. (2010). Cultural aspects in social anxiety and social anxiety disorder. *Depression and Anxiety, 27*(12), 1117–1127.
- Hosmer, D. W., Hosmer, T., Le Cessie, S., & Lemeshow, S. (1997). A comparison of goodness-of-fit tests for the logistic regression model. *Statistics in Medicine, 16*(9), 965–980.
- Jalilian, F., Karami Matin, B., Ahmadpanah, M., Motlagh, F., Mahboubi, M., & Eslami, A. A. (2014). Substance abuse among college students: Investigation the role of hopelessness. *Life Science Journal, 11*(9 SPEC. ISSUE), 396–399.
- Karatas, Z., & Cakar, F. S. (2011). Self-esteem and hopelessness, and resiliency: An exploratory study of adolescents in Turkey. *International Education Studies, 4*(4), 84–91.
- Kessler, R. C., Amminger, G. P., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Üstün, T. B. (2007a). Age of onset of mental disorders: A review of recent literature. *Current Opinion in Psychiatry, 20*(4), 359–364.
- Kessler, R. C., Angermeyer, M., Anthony, J. C., De Graaf, R. O. N., Demyttenaere, K., Gasquet, I., ... & Üstün, T. B. (2007b). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry: Official Journal of the World Psychiatric Association, 6*(3), 168–176.
- Kulick, G., & Wright, R. (2008). The impact of grading on the curve: A simulation analysis. *International Journal for the Scholarship of Teaching and Learning, 2*(2), 5.
- Lamis, D. A., Ballard, E. D., May, A. M., & Dvorak, R. D. (2016). Depressive symptoms and suicidal ideation in college students: The mediating and moderating roles of hopelessness, alcohol problems, and social support. *Journal of Clinical Psychology, 72*(9), 919–932.
- Lester, D. (2013). Hopelessness in undergraduate students around the world: A review. *Journal of Affective Disorders, 150*(3), 1204–1208.
- Lisnyj, T. K., Russell, R., & Papadopoulos, A. (2020). View of risk and protective factors for anxiety impacting academic performance in postsecondary students. *Canadian Journal of Higher Education, 50*(2), 71–88.
- Loh, K. K., Tan, B. Z. H., & Lim, S. W. H. (2016). Media multitasking predicts video-recorded lecture learning performance through mind wandering tendencies. *Computers in Human Behavior, 63*, 943–947.
- McLaughlin, K. A. (2011). The public health impact of major depression: A call for interdisciplinary prevention efforts. *Prevention Science, 12*(4), 361–371.

- Nicpon, M. F., Huser, L., Blanks, E. H., Sollenberger, S., Befort, C., & Kurpius, S. E. R. (2006). The relationship of loneliness and social support with college freshmen's academic performance and persistence. *Journal of College Student Retention: Research, Theory & Practice*, 8(3), 345–358.
- Ornstein, S. (2011). The hidden influences of office design. *Academy of Management Executive*, 3(2), 144–147.
- Pacht, A. R. (1984). Reflections on perfection. *American Psychologist*, 39(4), 386–390.
- Pompili, M., Innamorati, M., Narciso, V., Kotzalidis, G. D., Dominici, G., Talamo, A., Girardi, P., Lester, D., & Tatarelli, R. (2010). Burnout, hopelessness and suicide risk in medical doctors. *Clinica Terapeutica*, 161(6), 511–514.
- Range, L. M., & Penton, S. R. (1994). Hope, hopelessness, and suicidality in college students. *Psychological Reports*, 75(1 Pt 2), 456–458.
- Reavley, N., & Jorm, A. F. (2010). Prevention and early intervention to improve mental health in higher education students: A review. *Early Intervention in Psychiatry*, 4(2), 132–142.
- Rodger, S. C., & Johnson, A. W. (2005). The impact of residence design on freshman outcomes: Dormitories versus suite-style residences. *Canadian Journal of Higher Education*, 35(3), 83–99.
- Safdar, S., Friedmeier, W., Matsumoto, D., Yoo, S. H., Kwantes, C. T., Kakai, H., & Shigemasa, E. (2009). Variations of emotional display rules within and across cultures: A comparison between Canada, USA, and Japan. *Canadian Journal of Behavioural Science*, 41(1), 1–10.
- Schoon, I., Martin, P., & Ross, A. (2007). Career transitions in times of social change. His and her story. *Journal of Vocational Behavior*, 70(1), 78–96.
- Serafini, G., Parisi, V. M., Aguglia, A., Amerio, A., Sampogna, G., Fiorillo, A., ... & Amore, M. (2020). A specific inflammatory profile underlying suicide risk? Systematic review of the main literature findings. *International Journal of Environmental Research and Public Health*, 17(7), 2393.
- Shaikh, B. T., & Deschamps, J. P. (2006). Life in a university residence: Issues, concerns and responses. *Education for Health: Change in Learning and Practice*, 19(1), 43–51.
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13(4), 249–275.
- Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams, V. H., & Wiklund, C. (2002). Hope and academic success in college. *Journal of Educational Psychology*, 94(4), 820–826.
- Stevens, E., Guerrero, M., Green, A., & Jason, L. A. (2018). Relationship of hope, sense of community, and quality of life. *Journal of Community Psychology*, 46(5), 567–574.
- Taliaferro, L. A., Rienzo, B. A., Pigg, R. M., Miller, M. D., & Dodd, V. J. (2009). Associations between physical activity and reduced rates of hopelessness, depression, and suicidal behavior among college students. *Journal of American College Health*, 57(4), 427–436.
- U.S. Public Health Services. (1999). *The surgeon general's call to action to prevent suicide*. Retrieved from <https://www.hhs.gov/sites/default/files/sprc-call-to-action.pdf>. Accessed 13 Nov 2022
- U.S. Surgeon General. (2012). *National strategy for suicide prevention: Goals and objectives for action: A report of the U.S. Surgeon General and of the National Action Alliance for Suicide Prevention*. Retrieved from <https://www.hhs.gov/surgeongeneral/reports-and-publications/suicide-prevention/index.html>. Accessed 13 Nov 2022
- Ulrich, R. S., Zimring, C., Quan, X., & Joseph, A. (2006). The environment's impact on stress. In *Improving Healthcare with Better Building Design*. ACHE Management Series/Health Administration Press, 37–61.
- Vermeulen-Smit, E., Ten Have, M., Van Laar, M., & de Graaf, R. (2015). Clustering of health risk behaviours and the relationship with mental disorders. *Journal of Affective Disorders*, 171, 111–119.
- Viñas Poch, F., Villar, E., Caparros, B., Juan, J., Cornella, M., & Perez, I. (2004). Feelings of hopelessness in a Spanish university population - Descriptive analysis and its relationship to adapting to university, depressive symptomatology and suicidal ideation. *Social Psychiatry and Psychiatric Epidemiology*, 39(4), 334.

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