Utilizing the Health Belief Model to move post-secondary students toward flourishing mental health

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ABSTRACT

Factors related to the 'typical university experience,' such as high levels of perceived stress and a lack of sleep, negatively affect student mental health. The present study analyzes mental health risk and protective factors from 2,472 respondents gathered through the National College Health Assessment-II survey to inform the development of a mental health program for post-secondary students at an institution in Southwestern Ontario, Canada. Students who reported symptoms or diagnoses of anxiety and depression, above or below average stress, and few nights of restful sleep were more likely to be languishing than moderately mentally healthy, while students who reported average levels of stress and three or more restful nights of sleep per week were more likely to be flourishing than moderately mentally healthy. This work draws on the Health Belief Model in developing effective wellness programs to help students move along the mental health continuum toward flourishing.

Introduction

Poor mental health is a significant public health concern affecting young people, namely due to growing prevalence rates of diagnosed depression, anxiety, substance abuse, and mood disorders (Gallagher, 2015). Post-secondary students are especially vulnerable among populations in this age category to experience poor mental health. The most recent 2019 National College Health Assessment-II survey shows a drastic increase in burden from its 2018 iteration. 45.1% of North American students reported feeling depressed to the point of having difficulty functioning in the previous 12 months in 2019 compared to 41.4% in 2018, while 65.6% of students reported experiencing overwhelming anxiety in the same period in 2019 compared to 62.3% in 2018 (American College Health Association, 2018, 2019). Key factors contributing to poor mental health in this population include excess alcohol consumption (Blanco et al., 2008), overwhelming stress (Bovier et al., 2004), and a lack of adequate sleep (Lund et al., 2009; Neckelmann et al., 2007; Orzech et al., 2011).

Keyes (2002) Mental Health Continuum model conceptualizes mental health and mental illness as two related, yet distinct continua. Briefly, one continuum examines the presence or absence of mental illness, while the other indicates that of mental health (Westerhof & Keyes, 2010). Keyes (2002) categorizes

individuals as flourishing if they report high levels of emotional, social, and psychological well-being, while those who are languishing report low levels of these forms of well-being. There are several previously identified risk and protective factors contributing to languishing or flourishing mental health status. Individuals who experience high levels of stress, anxiety, depression, and poor sleep are more likely to be languishing than flourishing (Keyes, 2002). Students who are languishing experience negative psychological effects linked to adverse physical health outcomes, lower academic performance, decreased human capital, and increased engagement in health-diminishing behaviours (Eisenberg, Golberstein et al., 2009). In comparison, students who report high levels of flourishing mental health have been associated with having longer sleep duration (Kalak et al., 2014), strong social support, experiencing positive affect, and engaging in health-promoting behaviours (Schotanus-Dijkstra et al., 2016). Keyes (2002) model is especially useful for this population as it recognizes that mental health is multifaceted, with risk factors that contribute to adversely impact students' mental health, as well as protective factors that contribute to building positive mental health.

Reaching out for help and receiving treatment have been shown to reduce symptoms of mental health disorders amongst this population (Kirsch et al., 2015).

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Despite being at an increased risk for developing poor mental health (i.e. languishing), post-secondary students often do not seek help, commonly due to personal or perceived public stigma (Eisenberg, Downs, Golberstein, & Zivin, 2009), poor mental health literacy (Cheng et al., 2018) uncertainty regarding the benefits of professional help (Eisenberg et al., 2007), and not believing their distress is severe enough for receiving aid (Czyz et al., 2013). Beyond treatment-centered care, post-secondary institutions are increasingly interested in student wellness programs, initiatives, and strategies at a macro level; however, there is an apparent lack of uptake by students, which suggests a need for change to existing programming and efforts to increase mental health literacy among students (Cheng et al., 2018; Eisenberg et al., 2011).

The Health Belief Model (HBM) is a conceptual framework used to foster behavioural changes at the individual level (Green & Murphy, 2014). The model theorizes that health behaviour changes can be made successfully if messages effectively target the following factors: risk susceptibility and severity, benefits and barriers to making a healthy change, self-efficacy, and calls to action (Jones et al., 2014). The HBM focuses on the attitudes and beliefs of the individual. It states that for an individual to change their behaviour, they require sufficient individual motivation to make a change, along with holding the belief that making the change is both attainable and beneficial (Rosenstock et al., 1988). The HBM has been shown to increase intention to utilize health-promoting techniques among post-secondary students (Bistricky et al., 2017). Accordingly, a possible solution to increase uptake is to integrate the HBM in developing interventions to help students better understand the importance of the mental health continuum. The HBM can be used to help individuals move toward flourishing, by encouraging the development of protective factors for positive mental health, and coping with the risk factors associated with negative mental health.

The objective of this research is to measure the effects of various factors that contribute to the self-reporting of students' mental health status in order to provide sound recommendations to move them along Keyes (2002) spectrum toward flourishing. In turn, this work will help identify opportunities for how interventions, grounded in the HBM, can be targeted at post-secondary institutions to improve its students' mental health status.

Methods

Instrument

National college health assessment-II survey

The National College Health Assessment-II (NCHA-II) survey collects data from post-secondary students on various health-related behaviours, experiences, and perceptions, including mental health.

Participants and procedure

Participants were students attending an English-speaking post-secondary institution in Southwestern Ontario, Canada. Students were randomly selected for participation and recruited via email to complete the online survey in the spring of 2013 and 2016. Of the sampled students at this institution, the overall response proportion was 20.2% in 2013 and 31.1% in 2016. Approval from the institution's Research Ethics Board was received for this study (Certificate Numbers 13-JA-057 and 16-FE-031) in accordance with the ethical principles of the Declaration of Helsinki, and respondents provided informed consent for their data to be used in this work.

There were 2,671 total respondents to the survey (807 in the 2013 survey and 1,864 in the 2016 survey). This study was specifically interested in students under 30 years old, as mature students only make up a small proportion of the Canadian post-secondary student population (Statistics Canada, n. d.), and additionally face different stressors and possess better coping mechanisms when compared to their younger counterparts (Cleugh, 1972; Erb & Drysdale, 2017; Tilley, 2014). Early adulthood is also associated with higher prevalence rates of most mental health disorders, including depression (Substance Abuse and Mental Health Services Administration (SAMSHA), 2014) and anxiety (Kessler et al., 2005). These factors resulted in 125 students over the age of 30 being excluded from our analysis. The remaining eligible participants (n = 2,546) ranged in age from 18 to 30 years old (M = 20.97 years old; SD = 2.55; kurtosis = 1.76), and included students of all academic years. Of these 2,546 respondents, 97% (n = 2,472) completed the MHC-SF questions and were included for subsequent analyses. Nearly three quarters (74.4%) of respondents identified as female, almost one quarter (24.8%) identified as male, and a small proportion (0.6%) identified as a gender other than male or female. After analysis, gender was not found to be a confounder. Almost all (95.3%) respondents were domestic students, while only 4.4% identified as international students. Living arrangements differed, with living in off-campus housing being the most common response (64.2%). Overall, 48.8% of the respondents were categorized as flourishing, 44.2% as moderately mentally healthy, and 7.0% as languishing. This information is presented in Table 1.

Table 1. Participant demographics (n = 2,472).

Demographic	Number of Participants (Percent of Total)
Gender (n = 2,472)	612 (24.8%)
Male	1,839 (74.4%)
Female	14 (0.6%)
Other	7 (0.3%)
Missing	
Year of Study (n = 2,472)	510 (20.6%)
1st year undergraduate	535 (21.6%)
2nd year undergraduate	489 (19.8%)
3rd year undergraduate	420 (17.0%)
4th year undergraduate	138 (5.6%)
5th year or more undergraduate	358 (14.5%)
Graduate or professional	2 (<0.1%)
Not seeking a degree	13 (0.5%)
Other	7 (0.3%)
Missing	
International Student (n = 2,472)	109 (4.4%)
Yes	2,357 (95.3%)
No	6 (0.2%)
Missing	
Living Situation (n = 2,472)	505 (20.4%)
Campus residence hall	3 (0.1%)
Fraternity house	101 (4.1%)
Other university housing	226 (9.1%)
Parent/guardian's home	1587 (64.2%)
Other off-campus housing	46 (1.9%)
Other	4 (0.2%)
Missing	
Psychiatric Conditions	402 (16.3%)
Diagnosed with anxiety in the past 12 months (n = 2,468)	270 (11.0%)
Diagnosed with depression in the past 12 months (n = 2,461)	
Mental Health Continuum Status (n = 2,472)	1206 (48.8%)
Flourishing	1092 (44.2%)
Moderately mentally healthy	174 (7.0%)
Languishing	

Measures

Mental health continuum-short form

The Mental Health Continuum-Short Form (MHC-SF) is based upon both Ryff's (1989) six dimensions of psychological well-being and Keyes (1998) five-dimensional model about social-wellbeing. The MHC-SF, which is a three-factor measure of positive mental health, has previously been tested for reliability and validity in this population (American College Health Association, 2001, 2013; Doré et al., 2017; Orpana et al., 2017). See Appendix 1 to view the full MHC-SF.

Mental health status

Mental health status was selected as the outcome of interest. Students were categorized as languishing, moderately mentally healthy, or flourishing based on their responses to how frequently in the past month they experienced the fourteen symptoms making up the MHC-SF in accordance with Keyes (2002) model. Students who reported experiencing at least seven symptoms 'almost every day' or 'every day' including

at least one from the emotional well-being subscale were categorized as flourishing. Students who reported experiencing at least seven symptoms 'never' or 'once or twice' including at least one from the emotional well-being subscale were categorized as languishing. All students who did not fit into either category comprised the third category, moderately mentally healthy. Seventy-four students who did not answer all the questions of the MHC-SF were excluded from the analysis.

Risk and protective factors

The risk and protective factors affecting student mental health were derived through discussions among the research team focusing on risk factors commonly associated with university life, supported by the literature (Beiter et al., 2014; Eisenberg, Golberstein et al., 2009; Kalak et al., 2014). In this work, factors of interest included self-reported level of stress, self-reported feelings of depression and anxiety, diagnosis of depression and anxiety, and self-reported quality and quantity of sleep. These factors were then mapped onto the NCHA-II survey to identify variables to serve as proxy measures. For this analysis, responses to the diagnosed and self-perceived anxiety and depression were analyzed in a binary approach: 'yes, within the last 12 months' and 'no, not within the last 12 months.' Self-reported stress over the past 12 months was analyzed in five levels: 'no stress,' 'less than average stress,' 'average stress,' 'more than average stress,' and 'tremendous stress.' Sleep was analyzed using the responses to a question about the number of mornings feeling rested, which were categorized by the number of mornings students felt rested per week.

Analysis plan

Descriptive statistics were generated to break down participants' gender, mental health status, and year of study. To examine mental health status indicators, we conducted multinomial logistic regression analyses for each factor of interest. The 'moderately mentally healthy' category was used as the reference category. Gender was analyzed as a potential confounding variable by examining its impact on the other variables' coefficients in the model. A change of 30% or greater in any significant coefficient resulted in including gender in its respective model (Dohoo et al., 2010). The analyses were collated into several tables, highlighting variables that had a significant p-value at the 5% significance level. All data analyses were conducted using RStudio software (R Core Team, 2013).

Results

Depression/anxiety

Students who reported feeling very sad within the last 12 months were 3.61 times (CI 1.66–7.84, $p < 0.01$) more likely to be classified as languishing than moderately mentally healthy and 0.26 times (CI 0.21–0.33, $p < 0.01$) more likely to be classified as flourishing, compared to those who did not report feeling very sad within this timeframe. Relative to their reference group, students who reported feeling so depressed it impaired their ability to function were also more likely to be languishing (RRR = 6.04, CI 3.73–9.78, $p < 0.01$) and less likely to be flourishing (RRR = 0.23, CI 0.19–0.27, $p < 0.01$). As well, students who reported a diagnosis of depression were more likely to be languishing than moderately mentally healthy (RRR = 3.18, CI 2.21–4.56, $p < 0.01$) and less likely to flourishing than moderately mentally healthy (RRR = 0.27, CI 0.19–0.37, $p < 0.01$). These factors not only increase the likelihood that a student has languishing mental health, but also decrease the likelihood that a student has flourishing mental health. Refer to Table 2 for more details.

Students who reported feeling overwhelming anxiety within the last 12 months were more likely to be languishing than moderately mentally healthy (RRR = 3.74, CI 2.16–6.46, $p < 0.01$) and less likely to be flourishing than moderately mentally healthy (RRR = 0.32, CI 0.27–0.38, $p < 0.01$). The students who reported their anxiety impacted their academic performance were also more likely to be languishing than moderately mentally healthy (RRR = 2.45, CI 1.74–3.45, $p < 0.01$) and less likely to be flourishing (RRR = 0.34, CI 0.28–0.41, $p < 0.01$).

Students who reported a diagnosis of anxiety were more likely to be languishing than moderately mentally healthy (RRR = 2.02, CI 1.42–2.88, $p < 0.01$) and less likely to be flourishing than moderately mentally healthy (RRR = 0.47, CI 0.37–0.60, $p < 0.01$). Similar to depression, feeling overwhelming anxiety, experiencing anxiety that affected academics, and disclosing a diagnosis of anxiety made students less likely to be flourishing. See Table 2 for further information.

Stress levels

Relative to their reference group (moderately mentally healthy), students who reported no stress at all are more likely to be languishing (RRR = 11.04, CI 0.94–129.72, p 0.06) and students who reported less than average stress are also more likely to be languishing (RRR = 3.45, CI 1.15–10.30, p 0.03) or flourishing (RRR = 1.54, CI 1.01–2.36, p 0.05) as compared to students who reported average stress. Students who are languishing are also more likely to report more than average stress (RRR = 2.98, CI 1.63–5.44, $p < 0.01$) or tremendous stress (RRR = 9.23, CI 4.95–17.21, $p < 0.01$) compared to those who are moderately mentally healthy. Students who reported more than average stress (RRR = 0.45, CI 0.37–0.54, $p < 0.01$) or tremendous stress (RRR = 0.19, CI 0.14–0.26, $p < 0.01$) were less likely to be flourishing than moderately mentally healthy. Students who reported no stress at all and students who reported tremendous stress are the most likely to be categorized as languishing, indicating a U-shaped relationship between stress and mental health status. See Table 3 for further details.

Sleep

Students who reported their academic performance was affected by sleep difficulties were more likely to be languishing than moderately mentally healthy (RRR = 2.03, CI 1.46–2.82, $p < 0.01$) and less likely to be flourishing than moderately mentally healthy (RRR = 0.38, CI 0.32–0.46, $p < 0.01$) compared to students who did not report their academics were affected. Those who reported difficulty handling sleep difficulties were more likely to be languishing (RRR = 3.18, CI 2.24–4.51, $p < 0.01$) and less likely to be flourishing (RRR = 0.35, CI 0.29–0.42, $p < 0.01$) than moderately mentally healthy. Students who reported diagnosed insomnia were less likely to be flourishing (RRR = 0.50, CI 0.31–0.80, $p < 0.01$) than moderately mentally healthy. Each additional morning feeling rested increased the likelihood that a student is flourishing (RRR = 1.26, CI 1.20–1.32, $p < 0.01$) and reduced the

Table 2. Languishing and flourishing outcomes by self-reported feelings of depression and anxiety.

Variable	Outcome	n	RRR	95% Confidence Interval	p-value
Felt very sad	Languishing	161	3.61	1.66–7.84	<0.01
	Moderate	931	Ref.		
	Flourishing	754	0.26	0.21–0.33	<0.01
Felt so depressed it was difficult to function	Languishing	148	6.04	3.73–9.78	<0.01
	Moderate	594	Ref.		
	Flourishing	260	0.23	0.19–0.27	<0.01
Diagnosed with depression	Languishing	58	3.18	2.21–4.564	<0.01
	Moderate	154	Ref.		
	Flourishing	51	0.27	0.19–0.37	<0.01
Felt overwhelming anxiety	Languishing	153	3.74	2.16–6.46	<0.01
	Moderate	790	Ref.		
	Flourishing	560	0.32	0.27–0.38	<0.01
Academic performance affected by anxiety	Languishing	109	2.45	1.74–3.45	<0.01
	Moderate	465	Ref.		
	Flourishing	248	0.34	0.28–0.41	<0.01
Diagnosed with Anxiety	Languishing	56	2.02	1.42–2.88	<0.01
	Moderate	214	Ref.		
	Flourishing	125	0.47	0.37–0.60	<0.01

Note. RRR = relative risk ratio
Ref. = reference category

Table 3. Languishing and flourishing outcomes by self-reported feelings of stress.

Variable	Outcome	n	RRR	95% Confidence Interval	p-value
No stress	Languishing	1	11.04	0.94–129.72	0.06
	Moderate	2	Ref.		
	Flourishing	7	1.86	0.38–9.00	0.44
Less than average stress	Languishing	5	3.45	1.15–10.30	0.03
	Moderate	32	Ref.		
	Flourishing	93	1.54	1.01–2.36	0.05
Average stress	Languishing	13	Ref.		
	Moderate	287	Ref.		
	Flourishing	541	Ref.		
More than average stress	Languishing	80	2.98	1.63–5.44	<0.01
	Moderate	593	Ref.		
	Flourishing	503	0.45	0.37–0.54	<0.01
Tremendous stress	Languishing	69	9.23	4.95–17.21	<0.01
	Moderate	165	Ref.		
	Flourishing	59	0.19	0.14–0.26	<0.01

Note. RRR = relative risk ratio
Ref. = reference category

Table 4. Languishing and flourishing outcomes by self-reported sleep.

Variable	Outcome	n	RRR	Confidence Interval	p-value
Academics Affected by Sleep Difficulties	Languishing	95	2.03	1.46–2.82	<0.01
	Moderate	421	Ref.		
	Flourishing	236	0.38	0.32–0.46	<0.01
Difficult to Handle Sleep Difficulties	Languishing	117	3.18	2.24–4.51	<0.01
	Moderate	453	Ref.		
	Flourishing	243	0.35	0.29–0.42	<0.01
Diagnosed with Insomnia	Languishing	12	1.62	0.84–3.12	0.15
	Moderate	49	Ref.		
	Flourishing	28	0.50	0.31–0.80	<0.01
Number of mornings feeling rested	Languishing	1.60	0.69	0.62–0.76	<0.01
	Moderate	2.72	Ref.		
	Flourishing	3.53	1.26	1.20–1.32	<0.01

Note. RRR = relative risk ratio
Ref. = reference category

risk of languishing (RRR = 0.69, CI 0.62–0.76, $p < 0.01$). See Table 4 for more detail.

Discussion

Self-reported depression and anxiety, stress, and lack of sleep were all found to be significant risk factors contributing to languishing mental health. Students who are languishing are more likely to report feeling extreme (high or low) levels of stress, receiving fewer nights of restful sleep, and having undiagnosed depression or anxiety compared to moderately mentally healthy students. The components considered to be a regular part of student life (stress, anxiety, and a lack of sleep) are actually detrimental to students' psychosocial well-being and ability to perform optimally (Beiter et al., 2014). These findings support Keyes (2002) research, which identified relationships between impaired psychosocial well-being and languishing mental health. Importantly, these factors are also associated with a lower likelihood of flourishing.

Stress, at both high levels and low levels, is an important risk factor identified in this work. High stress is statistically significant; however, low stress is not. Interestingly, there appears to be a U-shaped relationship between stress levels and languishing mental health. Students who reported less than average stress and students who reported greater than average stress were more likely to be categorized as languishing. Conversely, flourishing students have a more linear relationship to stress and are more likely to report less than average stress. This has important implications for future program development; for students who are languishing, an average amount of stress may, in fact, be protective. This protective stress is often referred to as eustress, a positive response enabling an individual to become productive (O'Sullivan, 2011). Research has shown a positive correlation between eustress and life satisfaction in undergraduate students, which contributes to positive mental health (i.e. flourishing) (O'Sullivan, 2011). However, when stress exceeds one's eustress threshold, stress becomes debilitating for students; these students can no longer be productive, which in turn negatively affects their mental health status. With less than one percent of study participants reported feeling no stress, it is clear that programs aimed at developing coping strategies for stress would be relevant for the vast majority of students. This is consistent with other research demonstrating a high prevalence of stress within post-secondary student populations (Beiter et al., 2014; Bistricky et al., 2017).

Students who reported being too depressed to function and who were experiencing anxiety were found to be more likely to have languishing mental health. Having languishing mental health at the beginning of an academic year, or declining to languishing over the course of that year, has been shown to be a predictor of experiencing symptoms of depression and anxiety (Doré et al., 2020). While many students reported feeling very depressed or anxious, comparatively fewer reported a formal diagnosis. This is consistent with other research that shows that students who experience mental health issues often do not seek professional help (Czyz et al., 2013; Eisenberg, Downs et al., 2009). Students may feel that stress and mental health struggles are a 'normal' part of academic life, or that their academic and social activities take priority over their mental health care (Eisenberg et al., 2011). This treatment gap has also been demonstrated amongst adult populations who meet diagnostic criteria for mood and anxiety disorders (Wang et al., 2005).

Sleep was also found to be a significant factor impacting student mental health. Students who are struggling with sleep difficulties were more likely to be languishing than moderately mentally healthy. This is consistent with other research which shows that poor sleep is associated with poor mental health (Keyes, 2002) and poor academic performance (Baert et al., 2014). Restful sleep and good sleep hygiene are a protective factor against several mental health issues (Adams & Kisler, 2013; Neckelmann et al., 2007; Orzech et al., 2011), and poor sleep has been shown to be both a contributing factor to and an outcome of poor mental health in university students (Lund et al., 2009). For each additional night of restful sleep, students were more likely to be flourishing than moderately mentally healthy. Flourishing students only averaged about three nights of restful sleep per week, indicating that merely one or two extra nights of restful sleep may be enough to have positive impacts on mental health status. Post-secondary students' knowledge of sleep hygiene has also been shown to improve their sleep practices and quality (Brown et al., 2002).

The HBM will be used to contextualize responses in the survey, as well as to develop recommendations to proactively mitigate the adverse effects of the typical post-secondary experience to promote improved student mental health. The HBM has previously been incorporated into stress-reduction programs among post-secondary students (Bistricky et al., 2017). Future interventions should target each of the identified factors to help students gain the knowledge, resources, and skills necessary to move them along Keyes' mental health continuum toward flourishing.

The HBM requires an individual to acknowledge and recognize they may be susceptible to a certain health problem in order to adopt a behavioural change. In this case, students must be made aware that languishing mental health is a serious problem and that many factors contribute to it. Institutions should integrate a HBM lens into programs by developing communication strategies to increase students' awareness of the negative impacts of stress, anxiety, depression, and lack of sleep on their mental health status. As many respondents expressed an interest in learning more about stress reduction (81.2%), anxiety and depression (71.3%), and sleep (73.4%), it is evident that students recognize a need for more specific knowledge on these topics. Communication strategies should target each of the identified risk factors for languishing mental health, and emphasize the identified protective factors' benefits. For example, to target sleep, specifically, post-secondary institutions could communicate the benefits of sleep hygiene and reinforce the finding that just three nights of restful sleep

can be beneficial for mental health. Additionally, the institution should communicate the benefits of different types of help-seeking, as well as where to find these resources on campus and in the community.

There may be several perceived barriers that affect willingness to make the necessary health behaviour changes for students who are aware of the negative mental health outcomes of the typical student life. The HBM has been applied to student intentions to seek psychological help for anxiety disorders (Langley et al., 2018). As young people often do not seek help (Kirsch et al., 2015) and may prefer to be self-reliant when it comes to their mental health (Czyz et al., 2013), providing a variety of resources beyond traditional help-seeking (e.g. talk therapy) may be beneficial for students. Students who perceive social stigma or personal stigma surrounding mental health are less likely to seek professional help (Eisenberg, Downs et al., 2009). Thus, any mental health programs delivered to this population should normalize the act of seeking help and taking care of oneself. Other social factors, such as a lack of social participation and trust, have also been positively associated with an individual's lack of belief in their ability to make health changes (Lindström, 2006). Social support has been shown to contribute to students' positive mental health status (Stoliker & Lafrerniere, 2015). In qualitative interviews with Canadian university students, Giamos et al. (2017) found that while peer stigma can be a barrier to seeking mental health support, peers can also serve as an important alternative or additional form of support to traditional campus aid. Peer counseling, group therapy, and peer wellness centers are potential avenues that institutions can draw upon for the benefits of peer support.

Counteracting the effects of perceived barriers to making a health behaviour change are the perceived benefits of making that change. Individuals who believe making a change will result in positive outcomes are more likely to take steps toward changing their behaviour. Thus, the institution's wellness program must ensure students can foresee the benefits of taking part in the program. Gain-framed messages, which emphasize positive outcomes, are beneficial for illness prevention and encouraging restorative behaviours (Rothman & Salovey, 1997). Any future program should consider the use of gain-framed messaging to emphasize the potential benefits of controlling anxiety, depression, stress, and improving sleep hygiene, and students should be encouraged to use the available resources at their institution. Gain-framed messages can not only be used to target perceived health benefits, but may also be useful for promoting self-efficacy within students. Internal resources such as self-esteem and mastery are

important protective factors for student mental health (Bovier et al., 2004), and an external locus of control along with low self-competence has been associated with anxiety, depression, and stress in university students (Kurtović et al., 2018). Thus, using gain-framed messaging to emphasize an internal locus of control would likely positive affect student mental health. Increasing self-efficacy has also been shown to be a mediator for daily stress (Schönfeld et al., 2015). In the context of a mental health program, students should be made to feel that they have the ability to make positive changes for their mental health. Positive, gain-framed messages accompanied by suggestions for coping strategies may be useful for students.

Once individuals are made aware of the benefits of positive mental health and the risks of poor mental health, they must make positive behaviour changes. Necessary to these behaviour changes area cues to action, which trigger behaviour changes by transitioning individuals from contemplation to action. Cues to action may be internal, such as personal awareness of a health issue, or external, such as advice from family, friends, or health practitioners and influence from media or social environments (Jackson et al., 2007). As cues to action encompass personal knowledge, communication campaigns must highlight the identified risk factors. To target external factors, the institution must create a positive environment on campus for mental health. This may include normalizing conversation about mental health, creating opportunities to learn about campus mental health initiatives, and using campus media and social media to promote mental health resources. Campus mental health programs must be readily available and accessible with on-campus opportunities so that students know where to seek help for themselves, but also where to refer friends who may be struggling or languishing.

There are a few noteworthy limitations to this study. To participate in the survey, respondents must be current students at the institution. Thus, there may be a survival bias in that students who have dropped out due to poor mental health would not be captured in the survey. There is the potential that some students were included in both the 2013 and 2016 samples; however, only a small portion of the students enrolled in 2013 who would have been eligible for sampling would still be enrolled in 2016. Additionally, the MHC-SF relies on self-reported data, which may influence the results, and only has a limited number of questions for each variable. Self-reported data is an effective way to obtain mental health data, but there is the potential for respondents to provide untruthful responses (Lisnyj et al., 2020). Other studies in post-secondary populations have found that it is difficult to determine the accuracy of mental health status from self-reported mental health status, but that self-reported data is beneficial for the anonymous collection of personal data (Hartley, 2011, 2013). As all survey respondents represented one higher education institution, the results may be specific to that single institution. However, the study's findings are consistent with North American trends surrounding student mental health (ACHA, 2016), suggesting that program recommendations for this population may also be beneficial for North American university students in general. Future research should explore what mode of delivery is most appropriate for an HBM-based program (e.g. traditional talk-therapy, online, group discussions, and wellness programs). As the sample was mostly female, the risk and protective factors identified may be specific to females.

Conclusion

This work examined the factors contributing to student mental health status. Mental health is comprised of a spectrum ranging from languishing to flourishing, with moderately mentally healthy as an intermediate value. To develop programs that effectively target the students who need them the most, it is necessary to understand the factors that make students more likely to be languishing to move students along the spectrum toward flourishing. The factors chosen were those that a typical student will experience, and therefore might be those that are most accepted. Students who are languishing have been shown to experience overwhelming feelings of anxiety and depression, report extreme levels of stress (either high or low), and have poor sleeping habits. These findings, which are consistent with the literature, demonstrate the importance of addressing risk and protective factors contributing to student mental health. Interventions should address the identified risk and protective factors and integrate the HBM to better target students. The 'typical student experience' of high levels of stress and no sleep is normalized in post-secondary culture despite its adverse effects on student mental health. Future programs must show students that this should not be considered to be normal, and that it is possible to make changes to improve their mental health status.

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