Addressing Stress and Building Coping Capacity Among University Students

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Abstract

University students report high stress levels which impacts well-being and functioning. Limited support services and stigma around mental health difficulties present barriers for students' access to support. These issues signal a need for more innovative, resource-effective, and engaging approaches to support students' capacity to cope with stress. While universities have extended their services beyond traditional, resource-intensive mental health service delivery, there is limited evidence on the efficacy of low-intensity programming for supporting student stress and coping. The present dissertation examines innovative ways to connect university students with evidence-based resources to address stress and build coping capacity. Study 1, employing a longitudinal design examined the impact of early stress on students' adjustment to university over time (N = 122, M_{age} = 18.36 years, SD = .89; 73.8% women). Findings showed that elevated stress upon entry to university, assessed by a brief, 4-item measure, was a significant predictor of adjustment difficulties up to 18 months later. Results highlight the enduring effect of elevated stress over an extended period and suggest the feasibility of using brief screening measures to proactively connect students to resources to support their adjustment. Study 2 employed a quasi-experimental design to examine the acceptability and effectiveness of a stress-management and well-being program for students within a professional degree program (program group: n = 157, M_{age} =22.46 years, SD = 2.33, 88% women; comparison group: n = 63, M_{age} = 23.50, SD = 1.64, 85% women). Results revealed high acceptability of the program content, relevance, and value for professional and personal development as well as significant improvements across the outcomes of stress, anxiety, coping self-efficacy, and mindfulness among the program group in contrast to the comparison group. Study 3 sought to extend this instruction to the broader university student population through web-based delivery of resources for self-directed use. Building on the screening approach used in Study 1, Study 3 employed a screener to personalize

the intensity of recommended resources aligned with students reported level of need. Study 3 consisted of a randomized controlled design to examine the acceptability and effectiveness of an online self-directed resource for university students as assessed by group differences (directed: n = 78, M_{age} = 21.18, SD = 2.60, 83% women; non-directed: n = 77, M_{age} = 21.06, SD = 2.94, 81% women; comparison: n = 76, M_{age} = 20.79, SD = 2.16, 78% women) over time (baseline to follow-up) across stress, coping, and well-being outcomes. Results revealed high ratings of acceptability and effectiveness through significant improvements in stress and coping among the resource groups in contrast to the comparison group. Findings from this dissertation (1) reinforce the importance of stress as a key contributor to students' adjustment to university over the long-term and (2) highlight two innovative approaches to delivering stress management and well-being instruction within university that are feasible, acceptable, and effective for improving stress and coping. Each study offers a unique contribution to university student stress literature and advances our understanding of the applications of best-practice, low intensity support for university students' stress management and coping capacity.

Résumé

Les étudiants universitaires indiquent des niveaux de stress élevés qui ont un impact sur leur bien-être et fonctionnement. Les services de soutien limités et la stigmatisation des difficultés de santé mentale constituent des obstacles à l'accès au soutien. Ces problèmes soulignent la nécessité d'adopter des approches plus innovantes, plus efficaces en termes de gestion de ressource et plus engageantes pour soutenir la capacité des étudiants à faire face au stress. Bien que les universités aient étendu leurs services au-delà des services traditionnels de santé mentale à forte intensité de ressources, il existe peu de preuves de l'efficacité des programmes de faible intensité pour soutenir le stress et l'adaptation des étudiants. La présente dissertation examine des moyens novateurs de mettre les étudiants universitaires en contact avec des ressources fondées sur des données probantes afin soutenir leurs capacités à faire face au stress. L'étude 1, qui utilise un modèle longitudinal, examine l'impact du stress initial sur l'adaptation des étudiants à l'université au fil du temps (*N* =122; *Mâge*=18,36 ans, *É.-T.* =0,89; 73,8% femmes). Les résultats démontrent qu'un stress élevé à l'entrée à l'université, évalué par une brève mesure de 4 items, était un prédicteur significatif des difficultés d'adaptation jusqu'à 18 mois plus tard. Les résultats soulignent l'effet persistant du stress prolongé et suggèrent l'utilisation de mesures de dépistage brèves pour diriger les étudiants vers des ressources soutenant l'adaptation. L'étude 2 a utilisé un modèle quasi-expérimental pour examiner l'acceptabilité et l'efficacité d'un programme de gestion du stress et de bien-être pour les étudiants d'un programme professionnel (groupe programme: *n* =157; *Mâge*=22,46 ans, *É.-T.*=2,33; 88% femmes; groupe témoin: *n*=63; *Mâge*=23,50 ans, *É.-T.* =1,64; 85% femmes). Les résultats ont révélé une grande acceptabilité du contenu du programme, sa pertinence et sa valeur pour le développement professionnel et personnel. De plus, des améliorations significatives du stress, de l'anxiété, de l'auto-efficacité

d'adaptation et de la pleine conscience ont été observées dans le groupe du programme par rapport au groupe témoin. L'étude 3 visait à étendre cette formation à une population plus large d'étudiants universitaires en fournissant des ressources sur le web pour une utilisation autonome. Se basant sur l'approche de sélection utilisée dans l'étude 1, l'étude 3 a utilisé un outil de sélection pour personnaliser l'intensité des ressources recommandées en fonction du niveau de besoin indiqué par les étudiants. L'étude 3 consistait d'un essai contrôlé randomisé visant à examiner l'acceptabilité et l'efficacité d'une ressource d'utilisation autonome en ligne pour les étudiants universitaires, telles qu'évaluées par les différences entre les groupes (dirigé: *n*=78; *Mâge*=21,18, *É.-T.* =2,60; 83% femmes; non-dirigé: *n*=77; *Mâge*=21,06, *É.-T.* =2,94; 81% femmes; témoin: *n*=76; *Mâge*=20,79, *É.-T.* = 2,16; 78% femmes) au fil du temps en matière de stress, d'adaptation et de bien-être. Les résultats ont révélé des taux élevés d'acceptabilité et d'efficacité grâce à des améliorations significatives du stress et de l'adaptation dans les groupes de ressources par rapport au groupe témoin. Les résultats de cette dissertation (1) renforcent l'importance du stress en tant que facteur clé de l'adaptation à long terme des étudiants à l'université et (2) mettent en évidence deux approches novatrices de l'enseignement de la gestion du stress et du bien-être à l'université, qui sont réalisables, acceptables et efficaces pour améliorer le stress et l'adaptation. Chaque étude apporte une contribution unique à la littérature sur le stress des étudiants universitaires et fait progresser notre compréhension des applications des meilleures pratiques, du soutien à faible intensité pour la gestion du stress et la capacité d'adaptation des étudiants universitaires.

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Contribution to Original Knowledge

This dissertation provides a significant and timely contribution to knowledge advancing our understanding of how best to support university students' stress management and coping capacity in higher education contexts using low-intensity instructional and self-directed approaches. Namely, this dissertation comprises a series of studies investigating the enduring impact of stress on students' adjustment to university, even when measured using a brief 4-item scale and further demonstrates that stress, coping behaviors, and beliefs about coping can be influenced through programming embedded in curriculum or presented online for self-directed use. Specifically, study 1 reveals a significant relationship between stress and university adjustment over 18 months, using a short stress measure and extending the length of the follow-up period beyond timelines of earlier studies. Study 2 demonstrates the effectiveness of embedding stress-management and well-being instruction in a teacher education curriculum, responding to research calls to integrate stress and well-being instruction within teacher education. Finally, study 3 explores the acceptability and effectiveness of a universal, online, self-directed resource with findings demonstrating efficacy in enhancing students' stress-management and coping capacity. Overall, this dissertation research demonstrates that individual-level, low-intensity support for stress-management and healthy coping can be effectively delivered to students through setting-based and online, self-directed approaches. Findings provide an evidence-base to potentially inform the scaling up of individual support programming beyond the institution's health and wellness unit and the integration of these supports into routine activities within a university setting.

Contribution of Authors

Although I collaborated with co-authors for all three manuscripts presented in this dissertation, I am the first author across these studies. As first author, I was responsible for conceptualizing each study, which involved designing the research methodology, formulating research questions, and developing the data analytic plan. Additionally, I served as the project coordinator for the presented research projects and led on data collection, data analysis, and wrote each manuscript, including this dissertation.

Dr. Nancy Heath, my PhD supervisor, is a co-author on all three manuscripts given her supervision and mentorship throughout my doctoral studies. Dr. Heath's involvement spanned the entire research process, encompassing conceptualization, data collection, data analysis, interpretation of results, and providing extensive feedback on all manuscripts and this dissertation. Additionally, Dr. Melanie Joly is a co-author on Study 1 given her contributions to data collection, data analysis, and feedback on the written manuscript. Dr. Dana Carsley and Dr. Susan Rodger (my supervisory committee member) served as co-authors on Study 2 given their contributions to program development and consultations on data collection, interpretation of findings, as well as editorial feedback throughout the publication process. Similarly, Dr. Jessica Mettler has contributed to program and resource development and consulted on data analysis, interpretation of findings, and provided feedback on the Study 3 manuscript for which she is a co-author.

Finally, my fellow colleagues and team members Ms. Laurianne Bastien (Study 1 and 3), Ms. Isabel Sadowski (Study 2), Ms. Julia Petrovic (Study 2), Ms. Stephanie Zito (Study 2), and Ms. Sohyun Cho (Study 3) all served as co-authors assisting with literature reviews, data collection, and manuscript editing.

All three studies within this dissertation were realized with funding support from the following sources; (1) doctoral fellowship granted to me by the Fonds de Recherche du Québec – Société et Culture, (2) donor support from the Rossy Foundation for the development and evaluation of the program presented in Study 2, and (3) donor support as part of McGill's Bicentennial Campaign for the development and evaluation of the program presented in Study 3.

Introduction

University students' mental health and well-being has been a growing concern within higher education research and practice for many decades (Brown, 2018; Hill et al., 2020; Van de Velde et al., 2021). While students report experiencing high levels of stress and general distress and clearly indicate need for specific supports to address mental health and well-being concerns, the capacity for mental health service delivery on campus is limited and under increasing duress because of growing demand for services (Auerbach et al., 2018; LeViness et al., 2019, Van de Velde et al., 2021). The current state of the problem is such that it is no longer feasible to address student needs by simply increasing the availability of existing, traditional approaches to mental health and well-being supports that are often (a) resource- and time-intensive, and (b) delegated to and siloed within institutions' health and wellness service or counselling unit (Auerbach et al., 2019; Duffy et al., 2019; Hill et al., 2020). The current situation calls for a whole-campus approach whereby supports and resources to address stress, general distress, and to enhance student well-being are embedded within and delivered alongside teaching and learning activities to effectively support student well-being during their time in university (Bantjes et al., 2023; Duffy et al., 2019; Hill et al., 2020; Linden & Stuart, 2020).

The pursuit of higher education aligns with the developmental transition to adulthood for many individuals (Conley, 2014). Described in research literature as emerging adulthood, this developmental stage is conceptually distinct from adulthood and is supported by cumulative empirical evidence (Arnett, 2000, 2004; Swanson, 2016; Syed & Mitchell, 2013). Emerging adulthood is a complex period marked by exploration and the establishment of adult roles, often characterized as a time of feeling "in-between" (Arnett, 2000, 2004). The features of this developmental stage carry implications for the mental health and well-being of university

students, as it coincides with high rates of engagement in risky and unhealthy coping behaviors (Böke et al., 2019; Bukobza, 2009; Sussman & Arnett, 2014). For instance, the U.S. and Canada observe the highest reported prevalence of substance use coping (e.g., alcohol, cannabis, drugs) within this age group compared to older adults (Canadian Tobacco Alcohol and Drugs Survey, 2015; Substance Abuse and Mental Health Services Administration, 2022).

Another notable statistic pertaining to this age group includes reports of perceived loneliness as compared to the rest of developmental life span. Studies have highlighted emerging adulthood and university attending groups to be particularly vulnerable to experiences of loneliness (Hopmeyer et al., 2020; Luhmann & Hawkley, 2016). Furthermore, a recent meta-analysis found that loneliness levels among emerging adults increased in a linear fashion over the span of 43 years between 1976 and 2019 (Buecker et al., 2021). These findings are notable given the documented associations between loneliness and a variety of negative mental health and behavioural outcomes such as poor sleep, substance-use, depression, and anxiety (Peltzer & Pengpid, 2015; Pettite et al., 2015; Richardson et al., 2017; Stickley et al., 2014).

Expectedly, university students commonly report elevated levels of stress and psychological distress, recognizing these factors as significant contributors to their academic challenges and reduced engagement with studies (American College Health Association; ACHA, 2022; Sharp & Theiler, 2018; Stallman, 2010). Population-level surveys involving 54,204 university students in the United States consistently highlight stress (43.7%), anxiety (37.3%), depression (27.5%), and sleep difficulties (25.9%) as the most frequently identified factors affecting academic performance (ACHA, 2022a). Similarly, in Canada, a survey of 11,322 university students reveals that stress (51.5%), anxiety (43.3%), depression (30.4%), and sleep

difficulties (31.9%) have negatively impacted their academic performance in the past year (ACHA, 2022b).

The above-described statistics illustrate ongoing challenges around stress, mental health, and well-being during a key developmental process. Within university, these difficulties (i.e., high stress and distress, engagement in high-risk coping behaviours, lack of social connections) contribute to further challenges related to studies and may impair academic functioning, performance, and overall adjustment to university (Credé & Niehorster, 2012; Lisnyj et al., 2023; Tindle et al., 2022). While there is a clear need for support to mitigate the negative impacts of stress and mental health difficulties, research highlights several issues with regards to students' access to support services and resources to help them effectively address well-being difficulties (Dunley & Papadopoulos, 2019; Ebert et al., 2019; Eisenberg et al., 2011; Lui et al., 2022; Osborn et al., 2022). For example, wanting to handle problems on their own, internal and/or public stigma around mental health difficulties, and other individual, social, or system level barriers contribute to low rates of help seeking and service utilization, despite high levels of stress (Dunley & Papadopoulos, 2019; Ebert et al., 2019; Eisenberg et al., 2011; Lui et al., 2022; Osborn et al., 2022). Taken together, there is a need for more innovative approaches that connect students with resources to support their stress management, adjustment to university, and enhance their coping capacity.

Overall, research on university student mental health and well-being portrays difficulty and potential adverse long-term outcomes such that mental health and well-being in higher education is now seen as an issue to address at the level of public policy (e.g., Bantjes et al., 2023; Brown, 2018; Xiao et al., 2017). In recognition of the problem stated above, the Mental Health Commission of Canada (MHCC) partnered with the Canadian Standards Association (CSA) to

develop, launch, and monitor the implementation of a National Standard for Post-Secondary Student Mental Health and Well-being (CSA & MHCC, 2020). This national standard is the first initiative of its kind, providing a framework for enhancing system-level and individual supports towards promoting mental health and well-being in demanding higher education contexts. Importantly, this standard outlines recommendations for a move towards campus-wide, integrated, and holistic approaches to student support that promote positive learning environments and institutional cultures that are supportive of student mental health and well-being. The recommendations and guidelines presented within the standard are not prescriptive nor mandatory, meaning leaders in higher education have flexibility in interpreting the relevance of each recommendation for their own context and can decide specifically *how* they choose to implement part, or all, of the recommendations outlined.

The implementation of the standard needs to consider specific contextual factors and unique needs within each institution, it must also be data-driven and based on latest research evidence to ensure efficacy and sustainability over time (Duffy et al., 2019; MHCC & CSA, 2020). However, there is currently a paucity of research knowledge that could directly support this decision-making process. While there is a wealth of research detailing what is effective in terms of individual supports and programming (e.g., Amanvermez et al., 2021; Conley et al., 2015; Halladay et al., 2019; Joyce et al., 2018; Regehr et al., 2013; Worsley et al., 2022) and separately there is emerging research examining institutional or broader system level factors that contribute to student mental health and well-being (e.g., Thaivalappil et al., 2023a, 2023b), there is a disconnect between these two lines of inquiry. Thus, further research is needed to specifically explore *how* evidence-based individual level mental health and well-being supports can be effectively scaled up and integrated within the larger system of higher education (Bantjes

et al., 2023; Duffy et al., 2019; Fernandez et al., 2016; Linden & Stuart, 2020; Worsley et al., 2022).

Lastly, while cross-national epidemiological research demonstrates high rates of mental health disorders and suicidality among university students (Auerbach et al., 2018; Kiekens et al., 2021; Mortier et al., 2018), it is crucial to contextualize the difficulties addressed within this dissertation as non-clinical and distinct from clinical mental health disorders that require specialized high-intensity care and clinical treatment. Specifically, the focus of this dissertation is university students' experiences of stress over time and how best to connect students with low intensity, evidence-based instruction and resources to support their stress-management, coping capacity, and well-being. In addition, aligned with recommendations to explore new methods for embedding mental health and well-being supports within higher education (Duffy et al., 2019; MHCC & CSA, 2020), this dissertation explores two unique and innovative approaches for embedding mental health and well-being instruction in university to promote student mental health and well-being through pedagogy.

Thus, the overall goal of this dissertation research is to explore university students' experiences with stress over time and the impact of stress on adjustment to university while subsequently exploring the effectiveness and acceptability of two unique approaches for embedding instruction around stress management and well-being within the higher education context. In accordance with McGill University's guidelines for doctoral dissertations, this manuscript-style dissertation consists of the following sections: an introduction, a review of relevant literature (Chapter 1), three research manuscripts contributing to the overarching objectives (Chapters 2-4) with bridging sections in between each manuscript, and a summative discussion of key takeaways, implications, limitations, and future directions (Chapter 5).

Additional details for each of the three studies (e.g., REB approval certificates, data collection flowcharts, study measures, and program descriptions) are provided in Appendices A-D.

Chapter 1 presents a summative literature review on university student stress, adjustment to university and current approaches that have been used to support student stress management, coping capacity, and well-being. In addition, the theoretical frameworks that inform the dissertation research are described. The following three chapters present each of the three research manuscripts (Studies 1-3) that constitute this dissertation.

Study 1 (Chapter 2) sought to examine students' experiences of stress over time and to explore whether experiences of stress during the early stages of university (assessed using a 4-item stress questionnaire) have implications for students' subsequent adjustment to university. While research has previously documented significant associations between stress and adjustment to university over multiple months (e.g., Friedlander, 2007; Olmstead, 2016; Pancer, 2000), this study was the first to examine this association over a longer period (6 months and 18 months) while using scores on a very brief, 4-item questionnaire as the predictor variable.

Study 2 (Chapter 3) sought to explore the acceptability and effectiveness of integrating stress management and well-being instruction into a professional undergraduate degree program (i.e., Bachelor of Education). Specifically, Study 2 presents a setting-based intervention to explore pre-post and follow-up assessments across a range of stress, mental health, and well-being outcomes among undergraduate pre-service teachers. Furthermore, this study responds to the recognized urgency to enhance teacher education programs to better equip future educators to (a) develop their own personal resilience to effectively handle the stresses associated with a demanding profession and (b) address their students' mental health and well-being in the classroom (Arens & Morin 2016, Atkins & Rodger, 2016; Darling-Hammond, 2006).

Study 3 (Chapter 4) employed a randomized-controlled design to investigate the acceptability and effectiveness of sharing a web-based collection of multimedia resources for stress-management and well-being with the broader university student population for their self-directed use. In addition to examining the effectiveness and acceptability of the overall resource, this study examined whether there would be any added benefit of screening for students' need for support and directing them to resources matching those needs. Primary outcomes assessed included stress, coping, and well-being at pre-post and follow-up timepoints.

Finally, Chapter 5 presents a summative discussion of the overall findings from this dissertation including key contributions, limitations, and implications for future research and practice in the area of supporting university students' stress-management and coping capacity.
This dissertation research was fully supported by a provincial doctoral fellowship granted to the author by Fonds de Recherche du Québec – Société et Culture. Additionally, the development of the programs presented in Studies 2 and 3 were realized through donor-based support from the Rossy Foundation and McGill University's Bicentennial Campaign, respectively. All research presented in this dissertation complies with the ethical guidelines set forth by Canada's Tri-Council and have received approval from McGill University's Research Ethics Board (see Appendix A).

Chapter 1: Review of the Literature

The main objective of this dissertation was to examine university students' experiences with stress over time, the impact of stress on psychosocial adjustment to university, as well as explore two innovative instructional approaches to support stress-management, coping capacity, and well-being. The following review of the literature presents an overview of the current context of university student stress, mental health, and well-being followed by a discussion of recent approaches for supporting student mental health and well-being during their time in university. Specifically, the discussion will focus on what has been tried to date and recent findings of efficacy of both setting-based and self-directed approaches with information on what works and the research gaps that need to be addressed. Additionally, the theoretical frameworks that informed this dissertation are discussed. Finally, this chapter concludes with the specific objectives of the each of the three dissertation studies.

Current Context: Stress, Mental Health, Well-being of University Students

Defining Stress

Stress is a complex construct that is studied using different methods across multiple disciplines including biology, medicine, neuroscience, epigenetics, and psychology in the absence of a universal definition (Manosso et al., 2022; Robinson, 2018). Despite the lack of a unifying definition encapsulating multi-disciplinary perspectives, in their review of the definitions and history of stress, Manosso and colleagues (2022) highlight several points pertaining to stress that are now widely understood and agreed upon. Namely, that stress is (1) an omnipresent experience albeit to varying degrees across the lifespan, (2) an important contributor to human health and well-being, and that (3) low intensity stress can help promote optimal performance and functioning only up to a certain point, after which it becomes detrimental to

performance thus following the inverted-U shaped relation described in the Yerkes-Dobson Law (Manosso et al., 2022; Robinson, 2018).

Building on the historical understanding of stress rooted largely in medicine, contemporary perspectives on stress within the field of psychology additionally recognize the role of environmental factors in one's stress experience and response (Manosso et al., 2022; Robinson, 2018). For example, Bronfenbrenner's ecological systems theory of human development highlights the interactions between the individual and the various systems in their environment, i.e., family, institutions, culture, and historical time, as contributors to stress experiences and developmental processes (Swick & Williams, 2006). Similarly, Lazarus and Folkman's (1984) transactional theory of stress posits that the experience of psychological stress follows a cognitive weighing of environmental demands against one's perceived internal capacity to effectively meet those demands. This process is called *appraisal* and demonstrates the interaction of psychological, environmental, and cognitive processes in how stress is perceived individually, while also explaining the large variability in how stress is experienced and responded to across individuals and contexts (Lazarus & Folkman, 1984; Robinson, 2018).

This dissertation focuses on individual stress experiences and coping responses in educational environments. Therefore, the definition that is used aligns with the conceptualization of stress within the transactional model presented by Lazarus and Folkman (1984); that is, stress is defined as an internal experience that occurs when we perceive that the demands of our environment exceed our capacity to meet those demands. This definition was chosen as it builds upon historical conceptualizations of stress as described above (Manosso et al., 2022; Robinson, 2018) while additionally incorporating the role of the external environment for individual stress and coping responses (Lazarus & Folkman, 1984). The subsequent section presents further

discussion on stress in relation to human development and its importance for overall mental health and well-being in educational environments.

Stress and Human Development

The experience of stress varies across the developmental lifespan (e.g., Koenig et al., 2011; Lupien et al., 2009; Mañas-Ojeda et al., 2020). Broadly, research shows that exposure to stressful life events during childhood can have enduring and diverse effects on cognitive functioning, mental health, and well-being into adolescence and adulthood (e.g., Chiang et al., 2022; Lupien et al., 2009; Mañas-Ojeda et al., 2020). Furthermore, there is meta-analytic evidence demonstrating that the relationship between stress and inflammation (a risk factor for illness) strengthens over time with the strongest, positive association being during adulthood (Chiang et al., 2022). Promisingly, despite the potential negative impact of stress for subsequent difficulties across the lifespan (e.g., higher risk for illness, development of psychopathology) this effect can be reversed or prevented through prevention and early intervention efforts at different stages of human development (e.g., Chiang et al., 2022; Mañas-Ojeda et al., 2020).

A developmental period that is particularly susceptible to stress and its effects is the transition to adulthood, often referred to as emerging adulthood (Arnett, 2000, 2023). Roughly spanning ages 18 to 29, emerging adulthood is a unique and challenging phase of life characterized by multiple transitions and uncertainties (Arnett, 2000, 2023). During this period, individuals are faced with significant stressors such as identity exploration, decision-making about education and career, establishing relationships, and finding stability in multiple aspects of their lives (Arnett, 2000, 2023; Schulenberg et al., 2004; Wood et al., 2018). Importantly, this developmental period comprised of multiple transitions and novel stressors very often overlaps

with university attendance for those who choose to pursue higher education (Arnett, 2016; Conley, 2014).

According to recent data from the United Nations Educational, Scientific, and Cultural Organization (UNESCO), university attendance following secondary education has doubled from 19% in 2000 to 40% in 2020, globally (UNESCO Institute for Statistics, 2022). In Canada, post-secondary attendance (i.e., college or university) among those aged 18-24 increased by 29% between 2000 to 2019 (Statistics Canada, 2020). More recently, it is reported that over 40% of the Canadian population aged 18-24, and 11% of those aged 25-29 were enrolled at a post-secondary institution over the 2022-2023 academic year (Statistics Canada, 2023). Interestingly, in initial conceptualizations of the theory of emerging of adulthood, Arnett (2000, 2023) often referred to increased rates of post-secondary attendance as one of the factors contributing to the prolonged transition between adolescence and adulthood. However, other researchers have argued that emerging adulthood as a developmental phenomenon may *only* apply to those pursuing higher education (Hendry & Kloep, 2010). Indeed, the universality of the theory of emerging adulthood is a topic of ongoing inquiry and debate (e.g., Côté, 2000; Jensen, 2011; Kloep et al., 2010; Sharon, 2016), therefore, it is critical to distinguish university students as a unique subgroup of emerging adults given differences in the types of stressors they face and the environments within which these stressors may take place (Arnett, 2016; Hendry & Kloep, 2010).

Specifically, in addition to the developmental tasks of emerging adulthood such as identity exploration and settling into adult roles, university students have the additional task of navigating academic demands and adjusting to the university environment. Referring back to the definition of stress that is used in this dissertation, which is that perceived stress arises as a

function of how environmental demands are appraised against one's internal capacities (Lazarus & Folkman, 1984), the university environment presents a unique opportunity to further study how university students experience stress in the context of a demanding academic environment. The next section reviews research on the prevalence and role of stress in university contexts.

Stress and University Students

Stress is a common experience among university students (e.g., Acharya et al., 2018; Ramón-Arbués et al., 2020; Sharp & Theiler, 2018). While there is no established global prevalence of stress given high variability across contexts and measurement methods, studies report prevalences between 34.5% to 50% among university attending populations (American College Health Association; ACHA, 2022a; Ramón-Arbués et al., 2020). Acharya et al. (2018) report that over 50% of students in their sample (n = 631) endorsed the following as significant stressors in university: changes related to their living environment, social activities, eating and sleeping habits, working with people you don't know, high workload, and low grades.

Stress is an important variable to study as research demonstrates significant associations between stress and key mental health and well-being outcomes among university students (e.g., Doom & Haeffel, 2013; Gardani et al., 2022; Pascoe et al., 2019; Ribeiro et al., 2018). For example, a systemic review reported that elevated stress was linked to lower quality of life and burnout (Ribeiro et al., 2018), while a recent meta-analysis found significant associations between stress and decreased sleep quality and greater insomnia (Gardani et al., 2022). In an earlier study among undergraduate students, life stress emerged as the strongest predictor of changes to health behaviours such as increased substance use, sleep problems, engagement in higher risk sexual behaviours, and decreased exercise and physical activity (Doom & Haeffel, 2013). Indeed, a university-wide cross-sectional study comprising my Master's thesis found a

significant association between increased stress and greater endorsement of alcohol and drug-use coping in a sample of 5,917 students (Böke et al., 2019).

Furthermore, elevated stress over an extended period often functions as an impediment to academic performance in higher education (ACHA, 2022a, 2022b, 2023; Frazier et al., 2019; Pascoe et al., 2019; Talib & Zia-ur-Rahman, 2012). The National College Health Assessment (NCHA) surveys administered by the American College Health Association (ACHA) over the years highlight the negative impact of stress for students' academic performance (ACHA, 2022a, 2022b, 2023). Among a sample of 78,024 students in spring 2023, 40.2% of respondents indicated that stress was negatively impacting their performance in a class or delaying their progress towards their degree (ACHA, 2023). Similarly, among a sample of 11,322 students attending university in Canada, 51.5% reported stress as having a negative impact on their studies. It is important to note that students were also asked about other factors that may be impediments to academic performance (i.e., up to 32 other issues such as acute diagnoses, chronic conditions, depression, anxiety, sleep difficulties) and stress emerged as the most commonly reported impediment to academic performance across the US and Canadian samples (ACHA, 2022a, 2022b, 2023). While data for the latest NCHA surveys were collected in the aftermath of the COVID-19 pandemic, surveys that preceded the pandemic report comparable statistics with 34.2% of 67,972 university students endorsing stress as an impediment to academic functioning (ACHA, 2019).

Indeed, the potential impact of the pandemic on stress and well-being in higher education contexts has been explored in research (e.g., Copeland et al., 2021; Wang et al., 2021). Systematic and meta-analytic reviews examining stress experiences during the COVID-19 pandemic have reported prevalence rates for stress symptoms to range between 23% to 31%

(Fang et al., 2022; Wang et al., 2021). One study examining stress among 2,691 students in a large public U.S. institution found that 88% of participants experienced moderate to severe stress during the early stages of the pandemic (Lee et al., 2021). Copeland and colleagues (2021) found that university students (N = 675) reported increased externalizing problems and attention problems following the onset of the pandemic. Encouragingly, authors also reported that students who were enrolled in a campus wellness program were less impacted in terms of problems with attention (Copeland et al., 2021). Overall, research suggests that the pandemic did impact student' stress experiences at a moderate level and emphasizes the importance and value of programming to support student stress-management and coping with difficulty (e.g., Copeland et al., 2021; Wang et al., 2021).

Stress has also been found to contribute to difficulties with adjusting to the university environment (Friedlander et al., 2007; Gfellner & Córdoba, 2011, 2017; Olmstead et al., 2016; Zhao et al., 2023). Adjustment to university is a multidimensional construct encapsulating the personal-emotional, social, academic, and institutional facets of adapting to the context of higher education (Baker & Syrik, 1984, 1999). This construct is widely studied given links to student retention whereby difficulties with adjustment were found to significantly predict students' decision to discontinue their studies at their institution or leave university altogether (Credé & Niehorster, 2012; Lapoint & Soysa, 2014).

Psychological distress refers to the experience of stress that is of high intensity over a prolonged period (Sharp & Theiler, 2018; Stallman, 2008). Psychological distress is also common in university with studies showing higher levels of distress within university groups in comparison to age-matched peers (Leahy et al., 2010) as well as to the general population (Bayram & Bilgel, 2008; Cooke et al., 2006; Larcombe et al., 2016; Stallman, 2008, 2010).

Sharp and Theiler (2018) have reviewed three decades of research demonstrating significant associations between psychological distress and sociodemographic and situational factors (e.g., family-demands, financial situation), academic and performance-related factors (e.g., satisfaction with studies, time-management, study skills), as well as personality and psychological attributes (e.g., coping skills, self-esteem, optimism) among university students (e.g., Andrews & Wilding, 2004; Bíró et al., 2010; Byrd & McKinney, 2012; Chen et al., 2013; Larcombe et al., 2016; Mikolajczyk et al., 2008). Specifically, factors such as financial stress, greater non-academic demands, low satisfaction with studies appear to be risk factors for heightened psychological distress whereas attributes such as coping skills, study skills, optimism, and self-esteem appear to function as protective factors linked to lower psychological distress (Bayram & Bilgel, 2006; Burris et al., 2009; Chen et al., 2013; Larcombe et al., 2016; Mikolajczyk et al., 2008; Sharp & Theiler, 2018; Sokratous et al., 2022). In the same review, Sharp and Theiler (2018) highlight attrition, impaired academic performance, and problematic health behaviours as key outcomes of psychological distress. Finally, mental health difficulties such as depression, anxiety, and obsessive-compulsive disorder have also been linked to the experience of psychological distress such that distress and difficulty with emotion regulation is considered a transdiagnostic underlying contributor across these conditions (Bayram & Bilgel, 2006; Bíró et al., 2010; Byrd & McKinney, 2012; Chen et al., 2013; McDermott et al., 2015; Stallman, 2020).

Beyond stress and distress, there are several other trends observed among university students that pose significant risk for their overall well-being. For example, large-scale epidemiological studies demonstrate that between 20% to 30% of university students globally meet DSM-IV criteria for at least one anxiety, mood, or substance disorder (Auerbach et al., 2016, 2018; Sheldon et al., 2021). In fact, research shows that the age of first onset of up to 75%

of mental health conditions takes place between the ages of 20 to 30 (Kessler et al., 2005; McGorry et al., 2011) which largely overlaps with university attendance (Arnett, 2016; Conley, 2014). Loneliness is also highly prevalent among post-secondary populations with a recent study reporting 31% prevalence of loneliness in a sample of 28,975 university students in Canada (Fagan et al., 2023). This is significant because loneliness is another key risk factor for adverse mental health and health behaviour outcomes (McComb et al., 2020; Peltzer & Pengpid, 2017; Richardson et al., 2017; Stickley et al., 2014).

Given the mental health and well-being vulnerabilities described above (i.e., stress, distress, loneliness, problems engaging in health behaviours), emerging adulthood and the university environment present a critical window of opportunity to support students' capacity to cope with difficulty in healthy and adaptive ways. It is imperative to offer support during this period and actively cultivate coping capacity and resilience, as persistent issues with stress, distress, and a lack of engagement in health-promoting behaviors may escalate into more severe mental health problems if not addressed promptly (e.g., Baik et al., 2019; Goodman, 2017; Raaper & Brown, 2020; Schwartz, & Petrova, 2019; Zivin et al., 2009). The recognition of the need to enhance university students' stress management and coping skills has gained momentum in higher education research and practice over the past several decades, as evidenced by the growing focus on this area in meta-analytic and systematic reviews (e.g., Amanvermez et al., 2021; Regehr et al., 2013; Worsley et al., 2022), as well as at the level of policy and system level guidelines for supporting university students (e.g., DiPlacito-DeRango, 2016; MHCC & CSA, 2020). Furthermore, recently two frameworks conceptualising (a) university students approaches to coping and (b) mental health support and service delivery in university contexts have been proposed. Namely, the health theory of coping (Stallman, 2020; Stallman et al., 2022) presents a

hierarchical framework outlining how university students endorse coping behaviours of increasing intensity corresponding to the intensity of stress or distress they experience (Stallman, 2020). Relatedly, the SteppedCare2.0 framework presents a re-organization of mental health services on campus emphasizing the value of low-intensity service options (e.g., self-directed tools, group programming) across a spectrum of service options for mental health care (Cornish, 2020; Cornish et al., 2017). Both frameworks have contributed to advancements in our understanding of how university students cope with stress and distress in university and their response to and use of services for their mental health and well-being. These two frameworks are therefore central to the present dissertation, along with the theory of emerging adulthood, and provide an important theoretical foundation informing this research program. The following section expands on the theory of emerging adulthood, the health theory of coping, and SteppedCare2.0 and is followed by a review of literature on current approaches to supporting university students stress-management and well-being.

Theoretical Frameworks

There are three theoretical frameworks which underlie the research proposed within this dissertation, namely; the theory of emerging adulthood (Arnett, 2000, 2023), the health theory of coping (Stallman, 2020; Stallman et al., 2022), as well as the SteppedCare2.0 framework that reconceptualizes mental health service delivery in higher education contexts (Cornish, 2020; Cornish et al., 2017). The theory of emerging adulthood is integral in providing a developmental perspective throughout the proposed research given the established implications of this unique period of development for university students' mental health, well-being, and overall functioning (Arnett, 2016; Duncan & Buskirk-Cohen, 2021; Murray & Arnett, 2019). The health theory of coping provides a framework for understanding university students' approaches to coping with

stress and general distress whereby the level of experienced distress is found to be proportional to the intensity of the coping behaviour employed in response, whether healthy or unhealthy (Stallman, 2020). The health theory of coping provides a novel conceptualization of university students' coping behaviours in response to distress and informs the approaches used within the proposed research towards promoting students' reliance on healthier strategies to cope which build resilience and offer protection from risk for adverse consequences (Stallman, 2020; Stallman et al., 2022). Lastly, the SteppedCare2.0 framework drives the format and content of the psychoeducational and applied supports that are developed and tested within the present research program (Campbell, 2021; Cornish, 2020; Cornish et al., 2017).

Overall, this dissertation presents a conceptual and applied coalescence of these three theories that are integral for our understanding of university student mental health, well-being, responses to distress, as well as the role of contextual supports and resources in enhancing students' well-being and capacity to cope with stress. The sections below provide additional details on these theoretical frameworks and elaborate on how they inform the proposed dissertation.

Emerging Adulthood

The theory of emerging adulthood was first proposed in 2000 as a research-based conceptualization of psychosocial development during the post-adolescence transition to adulthood (Arnett, 2000, 2023). This theory embodies the diversity of intra- and inter-personal processes and experiences between the ages of 18-29 to advance our empirical understanding of human development during the transition to adulthood within a 21st century context (Arnett, 2000, 2023; Arnett & Tanner, 2006; Duncan & Buskirk-Cohen, 2022). Emerging adulthood theory and research has identified five key dimensions of psychosocial states that characterize

the experience of emerging adulthood (Arnett, 2023; Reifman et al., 2007; Zorotovich, 2014). These features characterize emerging adulthood as a time of (1) identity exploration, (2) instability, (3) self-focus, (4) feeling in-between, (5) possibilities for transformation in various life domains (Arnett & Tanner, 2006).

In addition to these five features of emerging adulthood, *recentering* is presented as a key psychosocial task or process within this developmental period (Arnett & Tanner, 2006; Tanner 2006). Recentering describes a three-stage process that underlies the developmental trajectory from the end of adolescence to the early stages of adulthood. Stage 1 refers to the initial shift in relationship dynamics from ones that situate the adolescent as a dependent towards ones that recognize their autonomy, individuality, and independence as an emerging adult. Stage 2 refers to one's engagement with the developmental processes unique to emerging adulthood such as identity explorations and temporary and transient commitments in the domains of work, education, worldviews, and relationships, finally, stage 3 refers to processes by which emerging adults commit to longer term roles and responsibilities within domains that traditionally characterize adulthood (e.g., career, marriage/relationships, parenthood, worldviews). This proposed 3 stage process of recentering is empirically supported by life span development research (Arnett & Tanner 2006; Tanner, 2006).

Other theories also provide conceptualizations of human development between the ages of 18-29 with many building upon Erikson's theory of psychosocial development (Erikson, 1968; Murray & Arnett, 2019). For example, Chickering's *Vectors of Development* presents seven dimensions of development that pertain to the transition to adulthood: (1) *developing competence*, (2) *managing emotions*, (3) *moving towards autonomy*, (4) *developing mature interpersonal relationships*, (5) *establishing identity*, (6) *developing purpose*, and (7) *developing*

integrity (Chickering & Reisser, 1993). Similarly, Marcia (1966) presents a conceptual framework identifying four ego-identity statuses: (1) *achieved*, (2) *foreclosed*, (3) *moratorium*, and (4) *diffused* whereby each status characterizes both (a) the presence or absence of a developmental crisis experience and (b) the presence or absence of an established commitment to identity (Murray, 2019). The theory of emerging adulthood complements earlier developmental psychology research and builds on previous theories by explicitly integrating the influence of environmental context on development (Arnett, 2023; Murray & Arnett, 2019).

The unique aspect of the theory of emerging adulthood which presents a life-stage oriented and overarching conceptualisation of psychosocial developmental processes that underlie the unique trajectories and experiences of the 20s. Furthermore, emerging adulthood is the most widely researched theoretical conceptualization of young adult development within the context and needs of the 21st century (Murray & Arnett, 2019). The theory has also been rigorously debated and examined cross-culturally and with respect to its applications within and outside of university attendance (du Bois Reymond, 2016; Hendry & Kloep, 2010; Mitchell & Syed, 2015; Schwartz, 2016). Furthermore, the conceptualization of human development between the ages 18-29 presented within the theory of emerging adulthood has reported implications for mental health and wellbeing (Arnett, 2016; Baggio et al., 2017; Sussman & Arnett, 2014; Swanson, 2016). Additionally, the developmental processes described above often overlap with one's time in university for those who choose to pursue higher education (Conley et al., 2014). Thus, for the reasons detailed above, the theory of emerging adulthood is most suitable as a foundational theoretical framework within the present dissertation over other theories of development. Specifically, within this dissertation the theory of emerging adulthood provides an empirical characterization of university students' psychosocial development and

experiences in relation to their mental health and well-being during the pursuit of post-secondary education.

Health Theory of Coping

The health theory of coping conceptualizes all coping responses as effective in reducing momentary stress or distress and organizes coping behaviours as healthy or unhealthy based on their likelihood of leading to adverse consequences (Stallman, 2020). In addition, healthy and unhealthy coping behaviours are presented along a spectrum of intensity from low to high as this hierarchy of coping responses is directly linked to the intensity of the stress experience (Stallman 2020; Stallman et al., 2022). The health theory of coping has been proposed in the absence of a unified, overarching theoretical framework to conceptualize the relations between cognitive, psychological, and behavioural responses to general distress and uncomfortable emotions (Skinner et al., 2003). This theory addresses the above-mentioned gap to provide a clear, functional, and destigmatizing theoretical framework that furthers our understanding of *how* individuals cope with stress and distress (Stallman, 2020). According to the health theory of coping, low levels of experienced stress or distress often results in the use of low intensity coping responses whether they are healthy (e.g., self-soothing through positive self-talk, mindful awareness, or abdominal breathing) or unhealthy (e.g., negative self-talk, cognitive rumination, or suppression). The intensity of the coping response increases proportionally with the intensity of experienced distress whereby higher intensity, behavioural healthy coping responses may include engagement in activities for distraction, relaxation, or physical exercise, whereas unhealthy responses to greater distress may include aggression, emotional eating, self-harm, or substance use (Stallman, 2020). Importantly, suicidality is conceptualized as the highest intensity unhealthy coping response that may be employed in the face of highest intensities of stress and

distress and when lower intensity healthy (e.g., social support, clinical mental health care) or unhealthy coping responses (e.g., social withdrawal) are unavailable or insufficient in reducing the intensity of experienced distress (Stallman, 2020).

Despite the recency of the health theory of coping, applications within the higher education context and with front-line health professionals (paramedics and student paramedics) reveal promising findings that provide empirical support for this reconceptualization of coping responses (Dodd et al., 2022; Stallman et al., 2022; Warren-James et al., 2021). Importantly, this research demonstrates the existing reliance on healthy coping strategies among university students where high levels of stress and distress are common (Dodd et al., 2022; Stallman, 2011; Stallman et al., 2022). This challenges the stigmatizing notion that observed trends of high stress and distress in university are a result of students' individual inability to cope in effective ways. In addition, interventions that promote reliance on healthier coping strategies (compared to unhealthy ones that pose a risk for adverse outcomes) have demonstrated effectiveness in enhancing perceptions of self-efficacy as well as overall well-being among university students (Bastien et al., 2022; Stallman et al., 2019). Overall, the health theory of coping calls for increased emphasis on and promotion of healthy coping behaviours that do not pose a risk for long term adverse outcomes. This suggests a need for intentional, concerted efforts to promote low and high intensity healthy coping as a preventative approach to reduce risk of adverse consequences of stress and distress that compromise individual mental health and well-being. To that end, the proposed dissertation employs the health theory of coping to inform approaches used to embed both low and high intensity healthy coping and well-being instruction within higher education to support university student stress-management and well-being.

Stepped-Care2.0

The Stepped Care2.0 (SC2.0) framework is an innovative re-organization and conceptualization of mental health care and service delivery at a systems-level and is currently implemented in higher education institutions across Canada and North America (Cornish, 2020; Cornish et al., 2017; Richards, 2012). The framework is considered as a paradigm-shift within the provision of mental health care whereby SC2.0 was developed uniquely for the higher education context borrowing from the stepped model of mental health care developed in the United Kingdom (Bower & Gilbody, 2005; Cornish, 2020; Cornish et al., 2017; Richards, 2012). Specifically, SC2.0 presents a framework for mental health service delivery which includes interventions of varying levels of intensity highlighting the added value of psychoeducational, self-directed, and group/community-based interventions that take into account service users' autonomy and readiness for intervention. This framework acknowledges that mental health care and services therein are much more nuanced than traditional multi-session, one-on-one psychotherapeutic interventions which are resource intensive for both the service provider and service user. Presenting mental health care and services along a continuum of care also considers diversity of service users' unique needs and readiness for engaging with resources and supports for their mental health. Furthermore, the availability of lower intensity supports and interventions (e.g., psychoeducation, self-directed skill-building) supports service users' autonomy by providing meaningful opportunities for individuals to engage with their own mental health care and overall well-being (Cornish, 2020).

Importantly, the low-intensity steps of SC2.0, such as guided or unguided self-help, skill-building instruction, and group programming, represent foundational elements of mental health support that can be integrated into various educational contexts. These low-intensity steps

emphasize approaches that are accessible, flexible, and less resource-intensive compared to traditional therapy or counseling services. Given the necessity for leveraging teaching and learning practices for the design and delivery of low-intensity supports, SC2.0 acknowledges the importance of educational strategies in promoting mental well-being among students. This recognition opens up avenues for exploring how educational institutions can effectively utilize these low-intensity support options to complement higher-intensity mental health care services on campus. In essence, SC2.0 highlights the significance of leveraging pedagogical expertise and educational environments to enhance the delivery and impact of mental health support initiatives. However, implementation of the SC2.0 framework is currently reserved to the health and wellness service or unit within different universities (Cornish et al., 2017, Jacques & Abel, 2020). In contrast, in the present dissertation, the low intensity supports outlined within SC2.0 are employed in a non-clinical context leveraging pedagogical tools and practices. The approaches used to embed stress-management and healthy coping instruction in developmentally appropriate ways are in alignment with the lowest intensity steps of intervention used within SC2.0. Furthermore, given the low rates of help-seeking observed among university students (e.g., Dunley & Papadopoulos, 2019), extending low intensity supports beyond the clinical service delivery unit has the potential to connect students with support programming without relying on their help-seeking initiative. Finally, SC2.0 is an excellent complement to the health theory of coping (Stallman, 2020) as it presents a practical framework for the application of a hierarchy of coping responses which is intertwined with the theoretical hierarchy of coping presented in the health theory of coping.

Supporting University Students' Stress-Management and Coping Capacity

Supporting university student mental health involves implementing a comprehensive range of strategies, services, and resources aimed at promoting and maintaining the psychological well-being of students within the university setting. To date, efforts to support university students' stress-management and coping capacity has taken on many forms including; psychoeducational and/or skill-building prevention programs (e.g., Conley et al., 2015), interventions with instruction on specific coping techniques such as stress-management (e.g., Amanvermez et al., 2021), mindfulness instruction (e.g., Ma et al., 2019), resilience building programs (e.g., Ang et al., 2022) as well as cognitive-behavioural interventions (e.g., Regehr et al., 2013). Additionally, research has examined the effectiveness of delivering this content to students online using technology with promising evidence of effectiveness across systematic reviews or meta-analyses (e.g., Conley et al., 2015; Davies et al., 2014; Farrer et al., 2013; Harrer et al., 2014, 2018; Lattie, Adkins, et al., 2019). Notably, technology-delivered interventions leverage digital platforms such as websites, mobile applications (apps), and chatbots to provide mental health support and resources to users (e.g., Lattie et al., 2019; Opie et al., 2024). These digital interventions offer several advantages over traditional face-to-face interventions including accessibility, scalability, and convenience.

Recently, in a meta-review of 27 meta-analyses and systematic reviews of mental health and well-being interventions for university students, Worsley and colleagues (2022) found that, mindfulness-based and cognitive behavioural interventions as well as interventions delivered through technology emerged as the most effective approaches leading to improvements across a wide range of mental health and well-being outcomes (e.g., decreased stress, distress, depression, anxiety, increased well-being and positive mental health). Despite compelling evidence of effectiveness, the degree to which these above-mentioned interventions are sustainably

integrated within the university setting and used beyond the trials of effectiveness remains unclear. Importantly, interventions and programming for student mental health and well-being (once deemed effective) are often reserved for delivery through the university health and wellness centre which then relies on students' individual help-seeking initiative to access the intervention or program. This is a problem because research concurrently documents low-levels of help-seeking among university students with many services and resources remaining underutilized despite high need (Bourdon et al., 2020; Dunley & Papadopoulos, 2019). Consequently, there is a pressing need to explore alternative approaches for connecting students with resources and programming to support their stress-management and coping capacity. Setting-based interventions and self-directed supports are suggested as potential solutions to address the impact of low help-seeking behavior on resource utilization. These alternative and promising approaches are discussed in more detail in the final section of this literature review.

Setting-Based Approaches

Setting-based approaches for supporting university student stress-management and well-being refer to interventions or programming that are integrated within the larger university system as part of routine activities (e.g., Dooris, 2009; Fernandez et al. 2016). Setting-based approaches move beyond interventions focusing on individual risk factors and present a socio-ecological model for general health promotion at the population-level considering the role of the environment on individual stress and well-being outcomes (Dooris, 2009; Fernandez et al., 2016). Consideration of the university environment or context within setting-based approaches aligns well with the latest conceptualization of stress presented in the cognitive transactional model of stress, i.e., stress arises when we perceive that the demands of our environment exceed our capacity to meet them (Lazarus & Folkman, 1984). Thus, recognizing that individual

perceptions of stress can be influenced by contextual factors, setting-based approaches seek to modify aspects of the broader context (e.g., policy, curriculum, assessment strategy) that may be contributing to heightened perceptions of stress at the individual level (Dooris, 2009).

While the setting-based approach has been used extensively within the medical education setting (Dooris, 2009), research examining this approach in non-health related disciplines is limited in number and methodological rigour (Fernandez et al., 2016; Worsley et al., 2022). For example, Becker et al. (2008) evaluated the inclusion of an undergraduate course titled "Health in Modern Society" on students' mental well-being outcomes and found significant positive impact on mental health knowledge with non-significant findings for engagement in health behaviours and/or healthy coping. Similarly, the "Health Enhancement Program' is a mandatory course for first year medical students which shares information on the importance of physical and mental health, healthy coping strategies, as well as mindfulness-based strategies (Hassed et al., 2009). The evaluation study demonstrated improved outcomes for participants after course attendance such as higher quality of life, mental health, and decreased depression symptoms. However, despite promising findings, the lack of control conditions within the above studies limits interpretation of findings and generalizability beyond the individual evaluations. Lastly, Foster et al. (2014) examined the impact of embedding a short intervention on coping with daily stressors into an existing mandatory course for undergraduates and included a control group who did not receive the intervention. Results showed that the intervention was effective for student well-being only among the group who received both the intervention and text-reminders to engage with the healthy coping practices shared. There were otherwise no differences between the control and intervention conditions for well-being outcomes and interpretation of study

findings is limited by lack of randomization and extremely low rates of intervention adherence (less than 10% completed full study; Fernandez et al., 2016; Foster et al., 2014).

Thus, there is a clear need for further research to investigate the impact of setting-based approaches (e.g., embedding in curriculum) in non-health related fields using rigorous methodology. Concurrently, research highlights that students enrolled in professional programs (e.g., engineering, nursing, teacher education) may have unique needs for stress-management and coping as they prepare for specialized and highly regulated professions (Atkins & Rodger, 2016; Broglia et al., 2021). Specifically, research has called for the integration of stress-management and well-being instruction as part of teacher education curricula in order to (a) better prepare teacher candidates to effectively respond to stressors in a demanding profession and (b) support teachers' preparedness to effectively respond to their prospective students' stress and well-being needs in the classroom (Arens & Morin 2016, Atkins & Rodger, 2016; Darling-Hammond, 2006). Despite the above calls and the promise of the setting-based approach in a professional educational context, research examining the impact of integrating stress management and well-being instruction in teacher education curricula is lacking (Brown et al., 2019; Rodger et al., 2014; Schonert-Reichl et al., 2017). Thus, it remains to be seen whether embedding stress and well-being instruction within teacher education would be acceptable among teacher candidates while demonstrating efficacy for their stress, mental health, and well-being outcomes.

Online, Self-Directed Approaches

An additional approach to supporting university student stress-management and well-being that is increasingly adopted in higher education contexts is the use of digital technologies for delivering mental health and well-being information (e.g., Davies et al., 2014; Farrer et al., 2013; Harrer et al., 2018). Digital mental health interventions refer to interventions or programming

that are shared through web or mobile platforms (World Health Organization, 2016) and can take on many forms such as telehealth interventions through virtual meetings with mental health professionals, coached (or uncoached) completion of online instructional modules, or online programming and resources that are designed for independent, self-directed use (e.g., Lattie et al., 2019; Opie et al., 2024). Programming that is delivered digitally offers several advantages such as the potential of reaching students who may be reluctant to access in-person services, as well as providing an additional support option for students who may be on waitlists for more intensive services (e.g., group or individual counselling). Furthermore, convenience of accessing resources and supports online is supportive of student autonomy and allows them to decide when, where, and how to access and make use of resources aligned with their individual needs (e.g., Fleishman et al., 2018).

Overall, systematic and meta-analytic reviews of technology delivered interventions for university student mental health and well-being demonstrate the efficacy of this approach for benefiting students' stress, mental health, and well-being outcomes in comparison to controls who did not receive the intervention (Davies et al., 2014; Douwes et al., 2019; Farrer et al., 2013; Harrer et al., 2018). For example, a recent review of online interventions for university student mental health and well-being reported improvement across stress, anxiety, depression outcomes with additional observed benefits for social and academic functioning (Harrer et al., 2018). Similarly, Douwes et al. (2019) who reviewed the effectiveness of online mental health programs for youth (ages 18-24) across educational settings in Europe, reported small to moderate benefits for student well-being outcomes across all nine studies included in their review. While accumulating evidence demonstrates the promise of digital approaches for supporting mental health and well-being in university environments, more research is needed to parse out what

works best and how (e.g., Becker & Torous, 2019; Douwes et al., 2019; Opie et al., 2024). Namely, terms such as, *digital* or *technology-based* are quite general and need to be refined within the domain of stress-management and well-being research. Specifically, there is a need to better understand the features of digital interventions that contribute to their effectiveness for student outcomes to inform intervention design (Opie et al., 2024).

Research examining the impact of online, self-directed (used independently at one's own pace and discretion) programming and resources to support student stress-management and coping capacity is in its infancy. For example, Litwin et al. (2023) qualitatively explored the impact of SPARX (Smart, Positive, Active, Realistic, X-Factor thoughts) which was an online, self-administered gamified program for depression for Inuit youth in Nunavut (n = 11). The program presented evidence-based strategies derived from cognitive-behavioural therapy as integrated with Inuit-specific cultural practices and was implemented with the support of community facilitators (Litwin et al., 2023). Participants reported satisfaction with the program highlighting the engaging format and that it was beneficial for improving their mood and building their coping skills. Challenges were also noted during post-program interviews with some participants highlighting that the improvements to mood did not last long after program completion, that some program elements were oversimplistic, and that technical difficulties at times made it difficult to access the program (Litwin et al., 2023). Relatedly, Chung et al., (2021) examined the stress, well-being, and mindfulness effects of an online, self-directed mindfulness program for university students across two institutions in the United Kingdom and Australia. The study revealed that the self-directed program led to increased mindfulness, well-being, and decreased stress among participants where the intervention accounted for 12%, 11%, and 8% of the variance in mindfulness, well-being, and stress change scores respectively after controlling

for baseline scores (Chung et al., 2021). The authors followed-up with an ecological validation study in Australia by implementing the mindfulness program within the institutions Learning Management System (LMS) and evaluating the effectiveness of the LMS-delivered, self-directed format across the same outcomes (Chung et al., 2022). Results revealed similar benefits of using the program for improved stress, well-being, and mindfulness, however it also emerged that over half of study participants (58.6%, n = 489) did not engage with any of the program modules over the duration of the study (Chung et al., 2022). The high proportion of zero-uptake and overall low adherence to the program within this study highlights a key challenge within this line of inquiry which is how to best support students' engagement with and uptake of online programming for well-being (e.g., Becker & Torous, 2019; Douwes et al., 2019).

One approach that has been suggested as a solution to limited adherence and uptake has been to first screen for students' level of need for intervention and then refer them to programming and resources matching their needs as a way of proactively connecting students to available resources and programs for support. To date, the screening and referral approach has been examined within the context of higher-intensity, clinical needs such as suicide prevention and early intervention (e.g., Hasking et al., 2023; King et al., 2011). In addition, Deacon et al. (2017) examined the screening and referral approach for university students with a history of reading difficulties and invited those demonstrating high levels of need for individual consultations and coaching with academic advisors. The study showed increased use of academic advising services among students who exhibited a high level of need and were proactively referred to the consultation service. Whether the screening and referral approach can increase student engagement with and uptake of online programming to support their stress-management and coping capacity remains to be explored in research.

In summary, more research is needed to determine what works best and how in the area of supporting university students' stress-management and coping capacity. Overall, the university environment presents an excellent opportunity to support student well-being and coping capacity during a critical developmental transition period (Cunningham & Duffy, 2019; Duffy, 2023). The literature reviewed above demonstrates the importance of stress as a key variable of interest in academically demanding higher education contexts given significant associations with broad range of outcomes pertinent to overall mental health and well-being. Furthermore, the level of intensity of the stress experience is associated with the intensity of the coping behaviours students endorse (Stallman, 2020), therefore, there is a need to promote access to evidence-based, healthy coping strategies to prevent the adverse impacts of elevated stress and mitigate rates of engagement in high-risk, unhealthy coping behaviours.

First, it is important to examine students' experiences with stress over a longitudinal trajectory and determine whether stress plays a role in how students adapt to the university environment. In addition, it is critical to operationalize stress in a simple but effective way that can be used to screen for stress levels and potentially connect students to resources and support services matching their level of need. Second, it is critical to explore ways of integrating stress-management and coping supports into routine activities in university to address the issue of low levels of help-seeking. This can be accomplished through setting-based approaches where stress-management and healthy coping instruction can be embedded within an existing curriculum or course (Fernandez et al., 2016). Although tested and used routinely within medical education, setting-based approaches need to be tested for effectiveness and acceptability in non-health related fields. Lastly, following the proliferation of technology-based, online approaches for student support programming, emerging research highlights the promise of sharing online, self-

directed resources for students' independent use (e.g., Lattie et al., 2019). However, this research is in infancy and testing the acceptability and effectiveness of this approach for enhancing students' stress-management and coping capacity is an important direction for research. The principal aims of the present dissertation research are described in the next section.

Principal Aims of the Dissertation Research

The overarching objective of the proposed dissertation is to explore three unique approaches to embedding stress management and well-being instruction within a higher education context to promote healthy coping and well-being among post-secondary students. To this end, Study 1 titled "*Keep it Brief: Can a 4-item Stress Screener Predict University Adjustment Over 18-months?*" seeks to explore the feasibility of using a very brief screening measure for the early identification of students that may require additional supports for their adjustment to university. Specific objectives within study 1 are to (1) explore changes in students' reports of perceived stress and university adjustment over time (i.e., upon university entry, 6-month follow-up, and 18-month follow-up) and (2) to examine whether students' reports of perceived stress upon university entry is predictive of their level of perceived stress and university adjustment 6 months and 18 months later.

Study 2, titled "*Two for One: Effectiveness of a Mandatory Pre-service Teacher Personal and Classroom Stress Management Program*" examines the impact (i.e., effectiveness of improving key outcomes related to student well-being as well as students' ratings of satisfaction with the information presented) of the Regulating Emotions and Stress for pre-Service Teachers (RESST) program which is a curriculum embedded stress management and emotion regulation program to support student healthy coping and wellbeing as they prepare to graduate and enter their chosen profession. Specifically, study 2 seeks to (1) examine group differences

(intervention group vs no-intervention comparison group) in outcome measures over time (pre-, post-program, and 1-month follow-up). Group differences will be examined over time to detect possible changes in stress, anxiety, coping self-efficacy, mindfulness, and mental health as a function of the intervention and over time. Study 2 also seeks to (2) examine possible change over time (pre-, post-program, and follow-up) among factors assessed only within the intervention group (i.e., well-being, positive and negative affect, and teacher self-efficacy). Lastly, this study seeks to (3) explore students' ratings of acceptability and satisfaction with the intervention in terms of their reported learning, general response, as well as reported and intended changes in behaviour.

Finally, study 3 titled "*Does it work? Examining the Acceptability and Effectiveness of a Self-Directed Web-Based Resource for Stress and Coping in University*" examines the impact (acceptability and effectiveness) of a self-directed, web-based resource providing university students with evidence-based strategies for stress-management and healthy coping. This study additionally tests whether there is an added benefit of screening for student level of need and directing them to resources matching their level of need. Specifically, study 3 seeks to (1) examine group differences in acceptability to test whether students' satisfaction and strategy use ratings differed as a function of the screening and directing approach (directed vs non-directed resource groups only). In addition, study 3 examines (2) group differences (directed vs non-directed vs waitlist comparison group) in outcome measures over time (pre-, post-, and 1-month follow-up). Group differences were over time to detect possible changes in the following outcomes; *stress*, *coping* (i.e., coping self-efficacy, coping behaviours), and *well-being* as a function of the screening and directing resource provision model. Lastly, study 3 seeks to (3) examine the effectiveness of the overall online resource in terms of group differences (resource

group; merged directed and non-directed versus the comparison group) on outcome measures and in terms of change in scores over time between baseline, post, and follow-up measures (i.e., stress, coping, and well-being).

Chapter 2: Study 1

Keep it brief: Can a 4-item stress screener predict university adjustment over 18 months?

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Abstract

The transition to university is an exciting yet challenging period for many students. While previous research has documented the association between stress and adjustment, little is known about the long-term effect of students' early stress on their subsequent university adjustment. The present study sought to examine the effectiveness of a short, 4-item stress measure in predicting student adjustment to university following a 6- and 18-month delay. Participants were 122 first-year, undergraduate students (M_{age}=18.36, *SD*=.89; 73.9% women) who reported their stress during their first semester (baseline), and university adjustment six months (T1) and 18 months later (T2). Baseline stress significantly predicted future adjustment to university at both timepoints, explaining 21% (T1) and 14% (T2) of the variance in adjustment. Results reinforce the importance of identifying early signs of stress during the transition to university given its enduring effect on students' adjustment. Findings are discussed within the context of approaches to student support.

Keywords: university adjustment, stress, screening, prevention

Keep it Brief: Can a 4-item Stress Screener Predict University Adjustment Over 18-months?

Introduction

The transition to university overlaps with the developmental period of emerging adulthood (18-29 years of age) for many students (Arnett 2000; Conley et al., 2014). Emerging adulthood is distinct from adulthood both conceptually and as a subjective experience, it is a challenging yet unique time of exploration and settling into adult roles and is often characterised as a time of feeling in-between (Arnett, 2000). Navigating overlapping life transitions can contribute to individual experiences of heightened stress. Given stress is associated with number of adverse psychosocial and behavioural outcomes (Galambos et al., 2013; Holinka, 2015; Lovell et al., 2014; Stoliker & Lafreniere, 2015) feelings of increased stress during the early stages of university may further burden students' capacity to cope effectively. Indeed, research suggests a predictive relation between students' reports of high stress and diminished subsequent adjustment to university life (Friedlander et al., 2007; Olmstead et al., 2016; Pancer et al., 2000). University adjustment plays an important role in shaping students' experiences on campus. Therefore, it is crucial to build a shared understanding of the important factors that may affect students' ability to successfully adjust to university. Moreover, finding ways to apply this shared understanding to develop programs and foster successful university adjustment while curbing the negative effects of stress is an area of research deserving of further attention (Conley et al., 2013). The present study seeks to investigate whether a very brief measure of stress upon students' entry to university is sufficient to predict their levels of stress and overall university adjustment up to a year and a half later. The specific objectives are outlined below; preceded by a review of existing literature on stress and adjustment to university.

Stress

Stress is an issue of increasing concern among university students (Durand-Bush et al., 2015). The high expectations placed on students within the university context, while encouraging learning and knowledge creation, can also prove to be challenging if students perceive these demands to be too great on an ongoing basis. A survey by Durand-Bush and colleagues (2015) revealed that students' reported levels of stress had increased compared to the results of earlier studies (Cohen et al., 1983; Palmer & Rodger, 2009). In recent population surveys in the US (N = 54,204) and Canada (N = 11,322), large proportion of students (44% and 52%, respectively) identified stress as a key factor negatively impacting their academic performance and engagement (American College Health Association, 2022a, 2022b). This is in line with the findings of earlier studies where heightened stress emerged as a predictor of academic difficulty (Stoliker & Lafreniere, 2015).

Among university students, stress is also linked to decreased engagement health promoting behaviours (Lovell et al., 2014) lower life satisfaction (Holinka, 2015), depression, and anxiety (Price et al., 2006). Another important consideration is the trajectory of stress over time, with research showing significant differences in stress by year of study (e.g., Bewick et al., 2010; Böke et al., 2019). In terms of outcomes related to university adjustment, Friedlander and colleagues (2007) found that lower levels of stress in the first semester predicted better overall adjustment to university in the following semester. This is an important finding as it demonstrates the potentially enduring effects of heightened stress in the early stages of university in shaping students' subsequent experiences.

Adjustment to University

Adjustment to university is a multidimensional construct referring to one's ability to adapt to the demands of academic life, and consists of four domains; academic, personal-emotional, and social adjustment, along with institutional attachment (Baker & Siryk, 1984, 1999). Academic adjustment refers to students' engagement with academics, general satisfaction with courses and/or program of study. Personal-emotional adjustment constitutes one's psychological, behavioural, and physical capabilities of dealing with a new environment, whereas social adjustment refers to students' attitudes regarding their interpersonal relationships and social life. Lastly, institutional attachment refers to students' sense of belonging and comfort within their higher education institution.

University adjustment is a widely researched topic and many researchers rely on Baker and Siryk's (1984) conceptualisation of this construct. In a meta-analysis, Credé and Niehorster (2012), initially identified close to 750 articles that used the Student Adaptation to College Questionnaire. The authors found evidence for the predictive relation between university adjustment and student retention in higher education whereby a small to moderate correlation was found between the two (Credé & Niehorster, 2012).

Trait variables such as self-efficacy, internal locus of control, and self-esteem were also found to exhibit strong positive relations with university adjustment (Credé & Niehorster, 2012). Mettler and colleagues (2019) found a significant association between dispositional mindfulness and overall adjustment to university when controlling for students' self-reported levels of coping self-efficacy. State variables such as positive affect, low negative affect, and low stress were found to be predictors of higher scores on adjustment. Similarly, Gfellner and Córdoba (2011, 2017) conducted a cross-sectional study with multiple cohorts whereby a total of 1,086 students (660 students from a Canadian University and 426 from a Spanish university) completed the 10-

item perceived stress scale (Cohen et al., 1983) and the academic, personal-emotional, and social adjustment subscales of the SACQ (Baker & Siryk, 1999). Higher stress emerged as a significant predictor of adjustment difficulties in all three domains (Gfellner & Cordoba, 2011, 2017).

Another systematic review examined predictors of psychosocial adjustment among international students in the U.S.; with only 1 out of the 30 included studies following a longitudinal design (Brunsting et al., 2018). Notably, perceived control over academic stress and neuroticism emerged as key predictors of adjustment trajectories within this study (Hirai et al., 2015). These findings underscore the important role of perceived stress on subsequent adjustment outcomes which warrants further investigation. The overrepresentation of cross-sectional study designs within recent systematic reviews reinforces the need for longitudinal studies.

Stress and Adjustment

Lazarus and Folkman (1984) conceptualized perceived stress as an outcome of an imbalance between external demands and internal capacity whereby demands are perceived to exceed one's ability to cope. University adjustment, as proposed by Baker and Siryk (1984, 1999), is a closely related construct as adjustment is also a psychological outcome of one's interaction with or perceptions of their environment. Therefore, it is expected that perceived stress and adjustment to university would be associated with one another. The limited studies that have investigated the relation between stress and university adjustment longitudinally have found significant associations between these two variables. For instance, Olmstead and colleagues (2016) examined whether reports of stress within the first week would be predictive of students' reports of academic and social adjustment 15 weeks later within a sample of first year, male university students. The authors found that early stress was a significant predictor of social and academic adjustment 15 weeks later both directly, and indirectly as mediated by

loneliness and neuroticism. Thus, students that reported higher levels of stress during the first week of their first semester at university were significantly less likely to report successful social and academic adjustment at the end of the semester (Olmstead et al., 2016). Similarly, in a sample of 115 first year undergraduates, Friedlander and colleagues (2007) found that baseline stress (first two months) was a significant predictor of overall adjustment as well as the social, personal-emotional, academic adjustment domains at a 10-week follow-up (Friedlander et al., 2007). Therefore, the students who reported higher stress during the first two of months of starting university were also worse off in terms of adjustment at follow-up.

An earlier study which assessed baseline stress among 226 incoming undergraduate students also reported similar findings (Pancer et al., 2000). Even prior to the beginning of their first semester, students that reported higher levels of perceived stress at baseline exhibited lower levels of university adjustment 6 months later. Therefore, this predictive relation between early stress and subsequent university adjustment is consistent within the literature through replicated findings. Researchers have discussed several implications which generally centred on promoting early intervention and prevention efforts (Friedlander et al., 2007), promoting student involvement in campus activities and organizations (Olmstead et al., 2016), and psychoeducation around stress-management for students (Conley et al., 2013), among others (Bergin, & Pakenham, 2016; Gfellner & Cordoba, 2017). Although this is an important field to explore within prevention and intervention research, it is critical to first establish a clear timeline of the effect of early stress on university adjustment. Namely, would this effect extend beyond six months, or beyond the first few semesters of study?

The present study seeks to build on existing findings on the relation between stress and university adjustment to determine whether a very brief screening measure of stress would

predict university adjustment over a longer follow-up period, thus determining the effectiveness and feasibility of using a brief screener to identify students that may require early support. To date, studies have used lengthy baseline measures, which have been necessary, to obtain the breadth of information required to explore potential links between variables of interest. Given the mounting evidence on the predictive relation between early stress and subsequent university adjustment, the present study seeks to investigate whether students' reports of perceived stress on a very brief measure (i.e., the 4-item PSS; Cohen et al., 1983) would be sufficient to predict students' overall level of university adjustment over time. Furthermore, earlier studies investigating the relation between stress and university adjustment have had relatively short follow-up periods following their baseline measure. The follow-up delays for the studies detailed in this section were 10 weeks (Friedlander et al., 2007), 15 weeks (Olmstead et al., 2016), and 6 months (Pancer et al., 2000). Credé and Niehorster (2012) point out that difficulties in adjusting to university are normal and expected early on in a student's freshman year, whereas such difficulties may become problematic if they persist beyond this early stage. The literature has not yet examined whether early stress is predictive of university adjustment over longer periods of delay past students' first year of study. As such, the present study seeks to address this gap by examining whether a very brief measure of baseline stress, which ultimately could be used as routine screener, is predictive of reports of adjustment up to a year and a half later.

Accordingly, the first objective of this study is to explore changes in students' reports of perceived stress and university adjustment between three time points: baseline, 6-month follow-up, and 18-month follow-up. The second objective is to examine whether students' level of perceived stress in the first six weeks of university is predictive of their level of perceived stress and university adjustment six months and 18 months later. Considering the above review, greater

reports of stress are expected at Time 1 (T1) and Time 2 (T2) compared to the baseline (H1) given demonstrated differences in stress as students progress through university in the literature (Bewick et al., 2010; Böke et al., 2019). It is also expected that students' reports of overall university adjustment will differ between T1 and T2 whereby students are expected to report better university adjustment 18 months into their academic program (H2). Regarding our second objective, it is expected that higher levels of baseline stress would predict higher levels of stress at T1 and T2 (H3). Finally, it is hypothesized that higher reports of baseline stress would predict lower levels of university adjustment reported at T1 and T2 (H4).

Methods

Procedure

The sample for the current study was recruited from an existing database of university students who participated in a large scale, university-wide screening study (Böke et al., 2019). As part of this screening study, the research team administered brief measures of perceived stress and coping behaviours during class time within the first six weeks of the fall semester (n = 1,553*)*. Those who expressed interest in the current study (n = 280) were sent an individualized link and password to complete a secured and confidential online survey 6 months after their completion of the screening measure (i.e., at T1). This survey was administered online and included a consent form and study questionnaires. The second wave of data collection (i.e., T2) took place 18 months after students' completion of the screening measure (time delay between T1 and T2 was 12 months). Participants were entered in a raffle to win one of 20 cash prizes of $25 at both time points. They also received a list of mental health resources (on- and off-campus) upon completion of the online survey. The institutional research ethics review board approved all study procedures.

Participants

A total of 280 students from the baseline sample indicated interest in participating in the current study at T1. The final sample for the current study consisted of 122 first-year students (M_{age} = 18.36 years, *SD* = .89; 73.8% women) attending a large institution in Canada. Participants in the present study were enrolled in different academic faculties, including Arts and Science (45%), Science (20.8%), Engineering (13.3%), Medicine (13.3%), Music (2.5%), Management (2.5%), and Education (2.5%). Most identified as White (43.3%) followed by Asian (23.3%), Canadian (15.8%), European (7.6%), Multicultural (5.8%), and other (4.2%). Half of the 122 first-year students who fully completed the online survey at T1 participated again at T2 (*n* = 64; M_{age}= 19.53 years, *SD* = .86; 82% women). A portion of these participants reported having changed their program of study (22.2%) and/or their institution (3.3%) between baseline and T2. Compared to students who did not participate at both time points, those who did were not significantly different in their reports of perceived stress at baseline, and perceived stress and university adjustment at T1. No significant differences between T2 completers and non-completers were found on any of the demographic variables at baseline.

Measures

Demographics

At baseline, participants completed demographic questions about their age, gender, ethnic identity, and program of study.

Stress

The four-item version of the Perceived Stress Scale (PSS-4) (Cohen, 1988; Cohen et al., 1983) was employed to measure the degree to which participants perceived their life as stressful at baseline, T1, and T2. The PSS-4 is a brief measure that was originally developed for phone

interviews and deemed suitable as a screening measure of one's global appraisal of stress. Items on the PSS-4 include: (1) *In the last month, how often have you felt unable to control the important things in your life*; (2) *In the last month, how often have you felt confident about your ability to handle your personal problems?*; (3) *In the last month, how often have you felt that things were going your way*; and (4) *In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?* Each item is rated on the following 5-point Likert scale: (0) *Never*; (1) *Almost Never*; (2) *Sometimes* (3) *Fairly Often* (4) *Very Often*, such that higher scores are indicative of greater perceived stress in the past month (items 2 and 3 are reverse-scored; Cohen et al, 1983; Cohen, 1988). The PSS-4 had adequate internal reliability at each time point in the current study (α = .76, .76, and .75 at baseline, T1, and T2 respectively). These values are comparable to psychometric properties of the PSS-4 reported in the literature (Warttig et al., 2013). In addition, the use of the PSS-4 as a brief screening measure in the present study is supported by previous administrations with university student samples (e.g., Böke et al., 2019; Cheema et al., 2022; Ibarra-Mejia et al., 2022), as well as population studies that have deemed it as an appropriate instrument for use across cultural contexts (Warttig et al., 2013).

University Adjustment

The Student Adaptation to College Questionnaire (Baker & Siryk, 1999) was used to examine participants' overall university adjustment six months and 18 months following their transition to university. The SACQ consists of 67 self-rating items, which assess four dimensions of university adjustment: academic, social, personal-emotional, and institutional attachment. Sample items for each subscale include: (academic) *I am not doing well academically for the amount of work I put in*, (social) *I am having difficulty feeling at ease with other people in*

college, (personal-emotional) *I haven't been able to control my emotions very well lately*, and (institutional adjustment) *Lately I have been giving a lot of thought to transferring to another college*). Each item is scored on a nine-point Likert scale ranging from (1) *applies very closely to me* to (9) *doesn't apply to me at all* whereby some items are reverse scored. Higher scores on the SACQ reflect a better university adjustment. The SACQ full scale had excellent internal reliability at T1 and T2 (α = .93, .94). The SACQ is one of the most commonly used assessments of university student adjustment with evidence of construct validity (Baker & Siryk, 1999; Feldt et al., 2011). Although the best fitting factor structure of the measure is a subject of debate (Feldt et al., 2011; Taylor & Pastor, 2007), recent studies support the psychometric properties of the existing SACQ as a suitable measure to assess overall adjustment to university life among diverse student samples (Donado et al., 2021; Gao et al., 2023; Grama, 2018).

Data Analytic Plan

The analyses reported include the final sample of 122 first year university students that completed baseline measures and completed follow-up measures at T1. Pearson's correlations were used to explore longitudinal associations between perceived stress and university adjustment. A one-way repeated measures analysis of variances (ANOVA) was conducted to examine differences in reports of perceived stress at baseline, T1, and T2. A paired-sample t-test was run to determine differences in university adjustment from T1 to T2. Four bivariate linear regression analyses were conducted to examine the unique contribution of baseline perceived stress on perceived stress and overall university adjustment at T1 and T2, respectively. Additionally, the contribution of baseline stress on the four domains of adjustment was examined through separate bivariate linear regression analyses. However, the primary analyses within the

present study used the full SACQ scale to examine impact of stress of overall adjustment over time.

Results

Preliminary analyses

Preliminary missing values analysis revealed that data were missing completely at random (MCAR; <5% missing; Tabachnick et al., 2007). To preserve data that was missing at random, incomplete responses were imputed within each subscale using the Expectation Maximization (EM) imputation method to maximize prediction accuracy. Table 1 displays descriptive statistics for the PSS-4 and SACQ across time points and Table 2 presents a correlation matrix. It should be noted that the descriptive statistics for the PSS-4 in the present study were deemed comparable to normative values reported in population studies (e.g., $M = 6.11$, $SD = 3.14$; Warttig et al., 2018) as well as means reported among recent university student samples (e.g., $M = 7.4$, $SD = 3.4$; Cheema et al., 2022). Furthermore, earlier principal component analysis of the measure in a population study found that 56.4% of variance in perceived stress is explained by the 4-item measure (Vallejo et al., 2018).

Changes in Perceived Stress and University Adjustment

The level of perceived stress significantly differed across time points, $F(1, 63) = 12.92$, $p < .01$, partial $\eta^2 = .17$. Post hoc analysis with Bonferroni adjustment revealed that the level of perceived stress significantly increased from baseline to T1, $t(63) = 1.39$ [95% CI, .48, 2.30], $p = .001$, and from baseline to T2 ($t(63) = 1.31$ [95% CI, .41, 2.21], $p = .001$. However, the level of perceived stress did not significantly differ from T1 to T2, $t(63) = .08$ [95% CI, -1.11, .95], $p = 1.00$. Similarly, no significant differences were found in reports of university adjustment from T1 to T2, $t(63) = -.22$, $p = .83$.

The Contribution of Baseline Stress on Follow-Up Stress and University Adjustment

Linear regression analyses revealed that the level of perceived stress on the brief 4-item screener within the first six weeks of university was a significant longitudinal predictor of continued perceived stress as well as university adjustment six months and 18 months later. Specifically, higher levels of perceived stress at baseline significantly predicted higher levels of perceived stress at T1 (β = .41; $F(1, 120) = 24.12$, $p < .001$; adjusted $R^2 = .16$) and at T2 (β = .38; $F(1, 62) = 10.13$, $p < .01$; adjusted $R^2 = .13$). Furthermore, higher levels of baseline perceived stress significantly predicted lower levels of university adjustment at T1 (β = -.46; $F(1, 120) = 32.83$, $p < .001$; adjusted $R^2 = .21$) and at T2 (β = -.40; $F(1, 62) = 11.51$, $p < .01$; adjusted $R^2 = .14$). Additional linear regression analyses were conducted to examine whether the observed relation between baseline stress and overall adjustment was robust across adjustment subdomains at T1 and T2. Baseline stress was a significant predictor of adjustment across all domains at T1: academic adjustment (β = -.41; $F(1, 120) = 23.972$, $p < .001$; adjusted $R^2 = .16$), social adjustment (β = -.26; $F(1, 120) = 8.574$, $p < .005$; adjusted $R^2 = .06$), personal-emotional adjustment (β = -.51; $F(1, 120) = 43.152$, $p < .001$; adjusted $R^2 = .26$), institutional attachment (β = -.20; $F(1, 120) = 4.923$, $p < .05$; adjusted $R^2 = .03$). At T2, baseline stress predicted adjustment in the academic (β = -.40; $F(1, 62) = 11.696$, $p < .001$; adjusted $R^2 = .15$) and personal-emotional domains (β = -.39; $F(1, 62) = 11.148$, $p < .001$; adjusted $R^2 = .14$), while no significant relation was found between baseline stress and institutional attachment (β = -.17; $F(1, 62) = 2.013$, p = .161) and social adjustment (β = -.24; $F(1, 62) = 3.764$, p = .057; adjusted $R^2 = .04$). Examining the adjusted R^2, baseline perceived stress explained the most variance in personal-emotional adjustment and overall university adjustment at T1 (26% and 21% variance explained,

respectively) when compared to the other follow-up variables, with effect sizes ranging from small to moderate across all analyses.

Discussion

This study sought to examine students' reports of stress and university adjustment over an 18-month period to determine the effectiveness and feasibility of using a brief 4-item screener to predict students' overall adjustment to university. Participants' reports of stress were found to change over the 18-month period where significant differences were found in reports of stress between baseline and both the 6-month (T1) and 18-month (T2) follow-up. Notably, students who were well into their second year of university studies reported significantly higher levels of stress compared to their stress levels during the first six weeks of university. This finding challenges the notion that the transition to university might be the most stressful time for students and further emphasizes the importance of considering the differing demands that may contribute to heightened stress as emerging adults progress through university (Gfellner & Córdoba, 2017). Interestingly, there were no significant differences in students' reported stress levels between the 6-month and 18-month follow-up, however both were significantly higher than stress at baseline. There were also no significant differences in students' reports of university adjustment between the 6-month and 18-month follow-up.

Reported levels of baseline stress emerged as a significant predictor of subsequent stress and university adjustment at the 6-month follow-up, and at the 18-month follow-up. These findings support earlier evidence on the predictive relation between early stress and subsequent adjustment to university (Friedlander et al., 2007; Olmstead et al., 2016; Pancer et al., 2000). In addition, the current study is the first to demonstrate the power of this early predictor over an 18-month timeline, as the present results reveal a similar effect while extending the follow-up period

an additional year beyond previous studies. The findings related to the increase in reported stress from baseline to 18-month follow-up, is also consistent with previous literature reporting similar patterns of stress over students' first year in university (Conley et al., 2014). Furthermore, the present study is unique in demonstrating the effectiveness and feasibility of using a four-item screener for identifying students who may need early support as they adjust to university.

The findings from the current study have several implications for university student support and resource allocation within higher education. The brevity of the stress measure used is significant given it explained 21% and 14% of the variance in students' adjustment scores 6-months and 18-months, respectively. This measure consists of 4-items and represents a psychometrically acceptable and useful tool to assess students' perceived level of stress as they enter university. Given the predictive relation between stress and adjustment that has been demonstrated in the literature (Friedlander et al., 2007; Olmstead et al., 2016; Pancer et al., 2000) and in the present study, students who report high levels of stress during their transition to university may be the ones in need of targeted support as they progress through their studies. Thus, the use of the PSS-4 (Cohen et al., 1983) as a screening tool would therefore allow universities to have strategically planned support resources in place for students who experience and report high levels of stress in the early stages of their university education.

University administrations are under increasing pressure to enhance support of student mental health and well-being (Anderson et al., 2015; Canadian Association of University Teachers; CAUT, 2013; Lisnyj et al., 2020). Historically, the approach to supporting student mental health on campus has been a reactive one as pointed out by Deacon and colleagues (2017) whereby student support services are often structured or framed in a way that relies on "late indicators of student need for support." (CAUT, 2013, p.432). Demonstrating a need for support

is often a precursor to receiving the necessary resources. Adopting this model, higher education institutions have several support systems and structures in place that students are either referred to or choose to use based on their individual needs. These support systems include services such as student counselling (Lees & Dietsche, 2012), academic advising (Himes & Schulenberg, 2016), peer support networks (Narayan & Sharma, 2016), and mindfulness initiatives (Azam et al., 2016), among others. Many of these services are necessities on campus and have demonstrable benefits for students that make effective use of them (Azam et al., 2016; Himes & Schulenberg, 2016; Narayan & Sharma, 2016). However, these services are increasingly under duress due to increasing demand and the prominence of mental health challenges on campuses (Lees & Dietsche, 2012; Pfeffer, 2016). Paradoxically, these services also face the challenge of low levels of help-seeking (e.g., due to stigma or wanting to handle problems on their own), which presents another barrier to access (Dunley & Papadopoulos, 2019). Strategic outreach is therefore needed to address existing barriers to optimal mental health and encourage more students to make use of available resources and services (Downs & Eisenberg, 2012). The overarching goal of these services is to alleviate problems once, or as, they arise. Although preventative approaches are increasingly adopted (Azam et al., 2016; Lisnyj et al., 2020; Narayan & Sharma, 2016) the challenge of connecting students to resources to promote collective engagement with these programs and initiatives persists.

In response, innovative approaches for supporting students, especially during the first-year transition have targeted pedagogy and embedded delivery of skill-building instruction around stress and well-being (e.g., Kift, 2015; Ragoonaden, 2017; Stallman, 2011). Pedagogy being the core of higher education, educators and researchers are presented with a unique opportunity to embed evidence-informed instruction around resilience, stress-management, and

social connection within the curriculum to support students' adjustment and psychosocial skill-development in these important areas (Kift, 2015; Kift & Field, 2009; Ragoonaden, 2017; Stallman, 2011). In the context of the present study, a promising example of leveraging the screening approach in tandem with personalized support through instruction and advising is presented by Deacon et al. (2017). Deacon and colleagues (2017) administered a brief, self-report screener upon university entry to identify students with a history of reading difficulties. Students were sent individualized invitations to visit the academic advising centre at their university whereas a comparison group of students received regular university correspondence about resources on campus. The researchers found that students' use of academic advising services and instruction increased following this brief, personalized outreach. These students were also found to continue making use of resources at the academic advising centre. Furthermore, the authors mentioned that increased use of university resources were found to be more pronounced for those students who reported having more robust academic difficulties during their first year of studies (Deacon et al., 2017).

Overall, results of the present study are promising and demonstrate a way in which research findings could be applied towards enhancing the university experience and promoting healthy adjustment to university. Specifically, current results demonstrate that a very brief stress screener upon entry to university can be used to follow-up and provide additional supports. This screening process can also help with early intervention efforts by directing students to support resources proactively.

The present study has several limitations that should be addressed. One of which is the limited sample size, particularly for the 18-month follow-up subsample. This was the result of participant attrition following the measures at T1 and the change in sample size is expected given

the considerable time delay between timepoints (12 months). The gender distribution within the sample was also overly representative of students identifying as women which may impact generalizability of findings. Furthermore, the effect sizes within the current study ranged between small to moderate, thus findings should be interpreted with caution. Additionally, only stress was examined as a predictor for adjustment to university, future studies should extend this work to assess other factors (e.g., depression, coping self-efficacy, dispositional mindfulness) that may longitudinally contribute to students' adjustment to university. This research in tandem can inform the development of brief screening measures that can be used within the university context to develop data-informed, proactive, and personalized approaches to student support. Lastly, although this study expands on earlier longitudinal examinations of the effect of stress on university adjustment, students were not followed for the entire duration of their university studies. Future studies should consider extending the follow-up period to assess the relation between stress and adjustment over multiple time points to examine the possibility of a curvilinear trajectory of the relationship over a longer period.

Despite the limitations noted above, the current findings build on existing evidence to merit a discussion of implications directed towards student support services on university campuses. Given the mounting evidence linking early stress and subsequent negative outcomes on adjustment, proactive approaches to student support could be incorporated through early screening and personalized outreach. This can include a move towards resilience building initiatives embedded across the institutions teaching and learning activities that extend beyond student support services (Kift & Field, 2009; Lisnyj et al., 2020).

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Study 1: Tables

Table 1

Descriptive Statistics of Study Variables

	Stress (PSS-4)					University Adjustment (SACQ)				
	n	Mean	SD	95% CI	Min - Max	n	Mean	SD	95% CI	Min - Max
Baseline	122	5.90	2.73	[5.21, 6.47]	0 - 12	-	-	-	-	-
Time 1	122	7.43	2.72	[6.54, 7.92]	2 - 14	122	366.64	65.19	[354.76, 387.61]	219 - 506
Time 2	64	7.16	2.70	[6.48, 7.83]	1 - 13	64	372.94	68.22	[355.90, 389.98]	223 - 532

Note. SACQ was not administered at baseline. Time 1 = 6 months after baseline; Time 2 = 18 months after baseline.

Table 2

Longitudinal Correlations Between the PSS-4 and SACQ

	1	2	3	4	5
1. Baseline PSS-4	_				
2. T1 PSS	.41***	_			
3. T2 PSS	.38**	.25*	_		
4. T1 SACQ	-.46***	-.32***	-.25*	_	
5. T2 SACQ	-.40**	-.26*	-.64***	.56***	_
Mean (SD)	5.90 (2.73)	7.43 (2.72)	7.16 (2.70)	366.64 (65.19)	372.94 (68.22)

Note. Baseline and T1 variables $n = 122$; T2 variables $n = 64$. ***$p < .001$.**$p < .01$.*$p < .05$.

Bridging to Study 2

Study 1 presented a longitudinal examination of university students' stress and adjustment over a period of 18 months and established that high levels of early stress emerged as a significant predictor of subsequent difficulties with overall adjustment to university. Beyond identifying a potential brief screening tool to identify students that may need additional support with adjustment in the early stages of university, Study 1 also highlights stress as an important contributor to subsequent difficulties with adjustment. Overall, results within Study 1 suggest that stress may be a key factor to target in supporting students' adjustment to university. Indeed, a large proportion of students identify stress as a common factor that negatively impacts their academic performance and engagement with their studies (ACHA, 2022a, 2022b). There is a clear need to effectively address stress in university and provide instruction and resources to support student capacity to cope with stress.

To date, a large body of research examined approaches for supporting stress-management and well-being in post-secondary settings with promising evidence of effectiveness. Review studies demonstrate improvements across the outcomes of stress, distress, depression, anxiety, mindfulness, well-being, and positive mental health following stress-management and well-being interventions tested among university student populations (e.g., Amanvermez et al., 2021; Conley et al., 2015; Halladay et al., 2019; Joyce et al., 2018; Regehr et al., 2013; Worsley et al., 2022). The above promising findings support growing interest in setting-based interventions (Fernandez et al., 2016; Worsley et al., 2022). Setting-based interventions refer to larger population- or system-level practices that aim to integrate health promotion and instruction as part of the routine activities in a school or workplace context (Fernandez et al., 2016). In contrast to other types of interventions (e.g., cognitive behavioural, mindfulness-based) that focus on

mitigating individual risk factors and behaviours, setting-based interventions additionally target contextual risk factors (e.g., pedagogy, policy, curriculum design) and recognize the important role of the external environment in influencing individual mental health and well-being (Fernandez et al., 2016). In their review, Fernandez et al. (2016) provide a systematic summary of existing setting-based approaches for improving mental health and well-being in university (e.g., embedding instruction in curriculum, mandatory skills-training) whereby individual studies report beneficial outcomes for students. However, the authors also note that this evidence base pertaining to the effectiveness of the setting-based approach is limited due to variability in research design across studies and the overrepresentation of studies conducted within health-related disciplines (Fernandez et al., 2016). It is therefore an important future direction for research to examine the effectiveness of setting-based interventions within non-health related contexts using rigorous methodology (Fernandez et al., 2016; Worsley et al., 2022).

Study 2 addresses the above-described need and presents a setting-based intervention for stress-management and well-being within a non-health related undergraduate professional degree program. Students in professional programs (e.g., engineering, nursing, teacher education) have specific needs for stress-management and well-being as they train to practice a specialised, often regulated profession. Furthermore, research has identified benefits to embedding targeted support within faculties to meet students' unique needs as they prepare for their chosen profession (Atkins & Rodger, 2016; Broglia et al., 2021). Research has also highlighted the urgent need to supplement training within teacher education programs to better prepare pre-service teachers to (a) respond to and support their students' mental health and well-being needs in the classroom and (b) build their own intra-individual resilience and capacity to effectively cope with the stressors of a demanding profession (Arens & Morin 2016; Atkins & Rodger, 2016; Darling-

Hammond, 2006). Thus, Study 2 examines the impact (i.e., acceptability and effectiveness) of the Regulating Emotions and Stress for pre-Service Teachers (RESST) program which is a curriculum embedded stress management and emotion regulation program that shares strategies for pre-service teachers own use as well as their use with their students once they enter the teaching profession.

Chapter 3: Study 2

Two for one: Effectiveness of a Mandatory Personal and Classroom Stress Management Program for Pre-Service Teachers

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Abstract

The present study employed a quasi-experimental design to evaluate the effectiveness and acceptability of a 6-hour mandatory stress management and well-being program for pre-service teachers. A program group of 157 pre-service teachers (M_{age} = 22.46 years; 88% women) completed the program as well as baseline, post-program, and follow-up measures. A comparison group of 63 pre-service teachers (M_{age} = 23.50 years; 85% women) completed measures at similar time points but did not receive the program. All participants completed measures of stress, coping self-efficacy, anxiety, mindfulness, and well-being. The program group completed additional measures of well-being, affect, and program satisfaction. Findings revealed significant improvements in key indices of mental health and well-being for those in the program group relative to the comparison group and high ratings of program satisfaction. Discussion focuses on implications of present findings for mandatory inclusion of wellness curriculum in teacher preparation programs with instruction on enhancing their own *and* their students' well-being.

Keywords: pre-service teachers, stress, well-being, teacher education

Introduction

Stress in the teaching profession has been a widespread concern for decades (Kyriacou & Sutcliffe, 1977; von der Embse et al., 2016, 2019). Teacher stress is defined as a negative affective experience that is related to one's ability to cope with stressors within the profession (Kyriacou, 2001). Elevated levels of teacher stress are associated with lower job satisfaction and an increased risk of burnout (Madigan & Kim, 2021; von der Embse et al., 2016), with as many as 40-50% of teachers leaving the profession within the first five years (Ingersoll, 2002; Kutsyuruba et al., 2022; Martel, 2009). Moreover, teacher reports of stress, burnout, and psychological distress directly impact their students' achievement, motivation, and stress (Arens & Morin, 2016; Herman et al., 2018; Oberle & Schonert-Reichl, 2016; Shen et al., 2015). As such, various programs have been developed and disseminated with the aim of supporting teachers' resilience to stress. In fact, recent research indicates that skills-based programs focused on providing teachers with information and strategies for managing stress and enhancing well-being can be effective (e.g., Jennings et al., 2017; Klingbeil & Renshaw, 2018; Schonert-Reichl et al., 2017; von der Embse et al., 2019).

Existing Approaches to Support Teacher Well-Being

To date, a variety of approaches have been used to support teacher well-being and professional development including mentorship and coaching techniques, whereby participation within such initiatives resulted in greater perceived well-being among early career teachers (Kutsyuruba & Godden, 2019; Kutsyuruba et al., 2019). In fact, a recent systematic review of interventions to support teachers' stress management identified four approaches that were utilized between 1995 and 2018 and discussed the relative effectiveness of each for reducing stress and burnout (von der Embse et al., 2019). Specifically, the unique approaches or

interventions consisted of *knowledge-based*, i.e., informational and focused on knowledge sharing in the domain of stress and stress management; *mindfulness-based*, i.e., sharing and practicing of mindfulness strategies, largely rooted in the mindfulness-based stress reduction (MBSR) approach (Kabat-Zinn, 1990); *behavioural*, i.e., focused on behavioural strategies such as formation of teacher consultation dyads, relaxation, and journaling to foster stress reduction; and *cognitive-behavioural*, i.e., focused on a combination of cognitive restructuring and behaviour regulation techniques and the acquisition of coping skills such as challenging persistent negative thoughts, yoga, and exercise for stress reduction (von der Embse et al., 2019). It should be noted that the behavioural practices of yoga and meditation are conceptually distinct from meditative practices that may be employed within mindfulness-based interventions rooted in MBSR (Kabat-Zinn, 1990). Thus, despite overlap in nomenclature, yoga and meditation do not comprise mindfulness-based practices unless specified. In the review, von der Embse et al. (2019) report that intervention duration varied widely across studies (three to 16 weeks) with a majority of interventions consisting of weekly meetings over a period of eight to 10 weeks. Overall, findings within the review were promising given the reported benefits for teacher well-being which included reduced stress, burnout, depression symptoms, and increased well-being and mindfulness following the interventions. In particular, the review study revealed that behavioural, cognitive-behavioural, and mindfulness-based interventions emerged as the most effective approaches to reduce teacher stress and improve well-being which are reviewed in detail in the subsequent sections.

Behavioural Interventions

Several studies to date have examined the effectiveness of behavioural interventions for stress management among teachers (von der Emse et al., 2019). For example, Ray (2007)

compared the impact of teachers' participation in consultation or students' participation in play-therapy on teacher stress and found significant reductions in stress for teachers across the study conditions. In addition, studies examining relaxation-focused behavioural techniques also report decreased stress among teachers following a 4-week relaxation intervention (Kaspereen, 2012) and after a 5-week meditation program (Anderson et al., 1999). More recently, Hepburn et al. (2021) examined the impact of a 6-week complementary intervention consisting of yoga and meditative practices to support teacher well-being. Participants highlighted both personal and professional benefits following the intervention including notable reductions in their stress response (Hepburn et al., 2021). Overall, research demonstrates the promise of utilizing behavioural strategies as an effective intervention for addressing stress among teachers (Hepburn et al., 2021; von der Embse et al., 2019).

Cognitive-Behavioural Interventions

Cognitive-behavioural interventions combine the acquisition of behavioural skills (e.g., yoga, meditation, exercise) with cognitive ones (e.g., cognitive restructuring, awareness of thoughts, challenging persistent negative thoughts) to support teachers' capacity to effectively address stress and/or burnout (Ghasemi et al., 2023; von der Embse et al., 2019). In a recent meta-analysis, Iancu et al. (2023) report that cognitive-behavioural and mindfulness-based interventions significantly alleviated the emotional exhaustion component of teacher burnout whereas other types of interventions had a non-significant effect for this outcome. Ghasemi et al. (2023) conducted a randomized controlled trial of a group-based cognitive-behavioural intervention for teacher burnout and found improvements for the treatment group that lasted for up to six months. This intervention consisted of weekly 2-hour facilitated group sessions for a duration of eight weeks (Ghasemi et al., 2023). It should be noted that intervention duration is an

important factor for effectiveness whereby smaller effect sizes for improvements in stress and burnout are reported for interventions of shorter duration ranging from 3-day workshop to those lasting less than 1-month (Iancu et al., 2023; Leung et al., 2011), whereas larger effect sizes are reported for interventions that last between 1-3 months (Ghasemi et al., 2023; Iancu et al., 2023; von der Emse et al., 2019).

Mindfulness-Based Interventions

Mindfulness-based interventions (MBIs) have also been used to support teacher stress management and well-being through skills-based programs (Klingbeil & Renshaw, 2018; von der Embse et al., 2019). Mindfulness in educational contexts is commonly defined as the purposeful awareness and nonjudgmental acceptance of present moment experiences (Kabat-Zinn, 1990, 1994). According to Shapiro et al. (2016), MBIs for teachers have three key benefits: (1) improved self-care practices, (2) improved instructional practices in the classroom, and (3) improved ability to teach mindfulness to students, which have all been subsequently associated with improved classroom climate. Indeed, several recent reviews have found MBIs for in-service teachers to be effective at improving their trait mindfulness, emotion regulation, well-being, classroom climate, and instructional practices, and at reducing their own stress (Emerson et al., 2017; Hwang et al., 2017; Klingbeil & Renshaw, 2018; Lomas et al., 2017). Two popular MBIs for teachers are Stress Management and Relaxation Techniques in Education (SMART-in-Education; Cullen & Wallace, 2010) and Cultivating Awareness and Resilience in Education (CARE; Jennings et al., 2013). SMART-in-Education is a fully manualized MBI for in-service teachers and is delivered in-person to K-12 in-service teachers through retreats or workshop series (Cullen & Wallace, 2010). Participation in SMART-in-Education has resulted in improvements in mindfulness, self-compassion, focused attention, working memory, and

relational competence, as well as decreased stress, anxiety, and burnout among in-service teachers (Benn et al., 2012; Roeser et al., 2013). Similarly, CARE is another mindfulness skills-based professional development program designed to enhance educators' well-being and stress management, as well as to prevent burnout. The CARE program is offered in-person and online to in-service teachers, principals, and school administrators through retreats or workshop series (Jennings et al., 2013, 2017). Studies have demonstrated that CARE significantly improves in-service teachers' emotion regulation, mindfulness, well-being, and sense of efficacy, and reduces their burnout/time-related stress and overall psychological distress (Jennings et al., 2013, 2017; Schussler et al., 2018). In addition, there is evidence that the acquisition of mindfulness skills can deepen the development of social and emotional learning competencies among teachers, and further enhance their capacity to foster positive and supportive environments within their classroom (Greenberg et al., 2014; Jennings & Greenberg, 2009; Lawlor, 2016). Taken together, research to date has documented numerous benefits of social-emotional learning and mindfulness skills-based programs at enhancing in-service teachers' well-being and resilience to stress, as well as contributing to improved classroom climate.

Social-Emotional Learning

A foundational framework that has been utilized to support teacher and student well-being in educational contexts is social-emotional learning (Durlak et al., 2011, 2015). A promising line of research suggests that when pre-service teachers receive training in social-emotional learning (SEL), they feel better prepared to cope with the demands of the profession and to foster a positive school climate (Schonert-Reichl et al., 2017). There are five competencies that are central to SEL (Durlak et al., 2011, 2015). *Self-awareness* is the ability to become aware of one's thoughts and emotions, and of their influence on behaviour. *Self-*

management is the ability to regulate one's emotions, thoughts, and behaviours effectively in different situations. *Social awareness* is the ability to take the perspective of and empathize with others from a diversity of backgrounds. *Relationship skills* include the ability to establish and maintain healthy and rewarding relationships with diverse individuals. Finally, *responsible decision-making* is the ability to make constructive and respectful choices about personal behaviour and social interactions, that consider the well-being of oneself and others. There is an abundance of research to support action to address SEL competencies in teachers as well as students (Durlak et al., 2011; Jones et al., 2013), and national initiatives have been undertaken to embed SEL within K-12 school contexts (Schonert-Reichl et al., 2017).

Current Issues with Supporting Pre-service Teacher Well-being

Despite their undeniable benefits, there are three notable limitations of existing skills-based programs to support teacher stress management and well-being. Namely, (1) they most commonly address stress and well-being once teachers have already joined the workforce which misses the opportunity to build teacher dispositions at the preparatory stage, (2) teachers/school staff self-select to participate in these programs based on available resources, perceived need, etc., and (3) they are often resource-intensive (i.e., financially costly and/or time consuming). By contrast, resource-effective, universal prevention programs available to pre-service teachers that equip them with stress management and emotion regulation skills *before* they enter the profession are lacking. In fact, research has highlighted the urgent need to better prepare pre-service teachers to (a) respond to and support their students' mental health and well-being needs in the classroom and (b) build their own intra-individual resilience and capacity to effectively cope with stressors in a demanding profession (Arens & Morin 2016; Atkins & Rodger, 2016; Darling-Hammond, 2006; Weston et al, 2008). Thus, teacher preparation curricula provide a

critical opportunity for the delivery of skills-based universal instruction around stress management and well-being to better prepare teachers for the profession, by providing them with evidence-based strategies to enhance their own well-being while learning how to support their students' well-being in the classroom. Such early intervention is crucial given the elevated levels of stress and burnout observed within the teaching profession (Ingersoll, 2022; Madigan & Kim, 2021; Martel, 2009; von der Embse et al., 2016), in addition to the documented impact of elevated teacher stress on adverse student outcomes (Arens & Morin, 2016; Herman et al., 2018; Oberle & Schonert-Reichl, 2016; Shen et al., 2015).

Although there has been an increased focus on mental health and well-being in schools recently, approximately a decade ago, Harris (2011) reported that the topic of stress and/or well-being were mentioned solely within the context of physical activity, targeting those in physical education streams and remained as an elective option within Canadian teacher education programs. Subsequently, Rodger et al. (2014) observed that of the 66 university teacher education programs across Canada, only two programs included courses with content relevant to mental health or well-being in schools, either in relation to students or teachers. Rodger et al. (2014) explicitly called for more inclusion of mental health and well-being topics including mental health literacy in teacher education programs. Similarly, in their review of teacher preparation programs, Schonert-Reichl et al. (2017, p. 8) noted that "very few states required pre-service teachers to learn such skills as how to identify their feelings, strengths, and weaknesses, or how to control and appropriately express their feelings, manage stress, and monitor their progress toward achieving goals." Most recently, Brown et al. (2019) also concluded that despite the expectation of professional competency among in-service teachers in their response to student mental health concerns, there remains a severe paucity of mental health

and/or well-being-related standards, guidance, and training for pre-service teachers across teacher education contexts in the U.S. and in Canada. It should be noted that teacher education is regulated provincially within Canada in contrast to the U.S. where it is regulated by the federal government (Brown et al., 2019). Lastly, considering the permeating and widespread impact of the COVID-19 pandemic on well-being in educational contexts, the need to include stress-management and well-being instruction within teacher education is ever more urgent (White & McCallum, 2021).

Promisingly, research suggests that when pre-service teachers receive preparation in topics such as stress management and emotion regulation, they feel better prepared to cope with the demands of the profession and to foster a positive classroom environment as teachers (Schonert-Reichl et al., 2017). Thus, there is evidence that teaching stress management to pre- and in-service educators results in measurable changes; however, a resource-effective, mandatory integrated program within a teacher preparation program that simultaneously includes strategies for personal stress management and well-being combined with instruction for strategy use in the classroom has yet to be examined. Only with the demonstration of effectiveness, acceptability, and feasibility of such a program is it possible for teacher preparation programs to begin to include such curricula as a requirement for teacher education.

The Present Study

The present study employed a quasi-experimental design to evaluate effectiveness and acceptability of a 6-hour modular, skills-based, stress management and well-being program for pre-service teachers, aimed at (a) enhancing pre-service teachers' mental health and well-being as they prepared to enter the teaching profession and (b) building pre-service teachers' capacity to effectively support their students' stress management and well-being in the classroom.

Specifically, this study sought to examine (1) the effectiveness of the program in terms of group differences (between program versus comparison groups) on outcome measures (i.e., stress, anxiety, coping self-efficacy, mindfulness, mental health) and in terms of change over time (i.e., pre-, post-program, and follow-up), (2) potential change over time (pre-, post-program, and follow-up) for variables assessed only for the program group (i.e., well-being, positive and negative affect, teacher self-efficacy), and lastly, (3) pre-service teachers' satisfaction with the program (i.e., acceptability) in terms of their reported learning, general response, and reported/intended changes in behaviour. It is hypothesized that (H1) the interaction term (group by time) will be significant for all outcomes tested with decreases in (a) stress, (b) anxiety, and increases in (c) coping self-efficacy, (d) mindfulness, and (e) mental health for the program group when contrasted with the comparison group over time. Pertaining to the second objective, it is hypothesized that (H2) significant increases in (a) well-being, (b) positive affect, and (c) teacher self-efficacy and significant decreases in (d) negative affect will take place over time within the program group. Given the exploratory nature of objective 3, no directional hypotheses were formulated in terms of program acceptability.

Method

Participants

Participants were two cohorts of pre-service teachers (i.e., Bachelor of Education [B.Ed.] students) at a large Canadian university. The first cohort of B.Ed. students (n = 63; M_{age} = 23.50 years, SD = 1.64; 85% women) served as a comparison group and did not complete the program; rather, these students completed the measures listed below between January and April 2018. The second cohort of B.Ed. students (n = 157; M_{age} = 22.46 years, SD = 2.33; 88% women) served as

the program group, completing the program and all measures between September and December 2019.

Program Development and Content

SEL is the foundational theoretical framework that informed the project. Particular attention was placed on the need for SEL competencies (i.e., self-awareness, self-management, social awareness, relationship skills, and responsible decision making) to be central to educational contexts for the benefit of teachers and students (Durlak et al., 2011, 2015; Schonert-Reichl, et al., 2017). Specifically, the SEL framework constituted the underpinning of the research, determining the focus of every element of the study (i.e., what we looked at, what we asked about). In addition, a combined top-down and bottom-up approach was used to determine the content and format of the stress management and well-being program. Namely, (a) the bottom-up approach utilized findings from a national needs and feasibility assessment with multiple interested parties (i.e., pre-service teachers, in-service teachers, school and B.Ed. program administrators; Zito et al., 2023). The aims of the needs assessment were to identify pre-service teacher needs with regards to stress management and well-being supports, as well as to establish preferred modes of support delivery. In complement, the top-down approach consisted of (b) a critical review of research literature on pre-service teacher well-being and teacher education (e.g., Arens & Morin 2016; Atkins & Rodger, 2016; Brown et al., 2019; Darling-Hammond, 2006; Weston et al., 2008), as well as (c) an environmental scan on best practices for supporting teachers' own well-being as well as their ability to effectively support their students' well-being (e.g., Durlak et al., 2011; Emerson et al., 2017; Hwang et al., 2017; Iancu et al., 2018; Jennings et al., 2017; Jones et al., 2013; Klingbeil & Renshaw, 2018; Lomas et al., 2017; Schonert-Reichl et al., 2017). Specifically, the top-down approaches for program development

revealed the critical need to include instruction and guided skill-practice in the areas of mindfulness, emotion regulation, awareness of thoughts, self-care practices, and interpersonal aspects of stress management (e.g., dealing with student problem behaviour, communication with colleagues, administrators, or students' parents). In sum, informed by the above, core topics within the program focused on enhancing within-individual capacity for stress management and related SEL competencies with skills-based instruction on mindfulness, emotion regulation, self-compassion, self-awareness, and social connectedness. Information and resources for maintaining strategy practice long-term were also shared. The final program consisted of six hours of instruction and guided practice modules delivered over four, 1.5-hour sessions by trained facilitators. Additional details on the content and structure of the pre-service teacher stress management and well-being program are provided as Supplemental Material.

Procedure

All procedures for this study were approved by the university's research ethics board. The stress management and well-being program was embedded within an existing seminar course that students were required to complete as part of their B.Ed. degree, which is a four-year curriculum at the institution where this study took place. The B.Ed. curriculum consists of courses in educational foundations and pedagogy, as well as school-based teaching internships where pre-service teachers receive mentorship by in-service teachers throughout the field placement. Within the present study, faculty administration, B.Ed. program directors, and course instructors collaborated with the research team to integrate the program's delivery and evaluation into the course curriculum. As such, program sessions and surveys were completed during class time. Note that the timeline prompts (e.g., over the last month) for all standardized measures within the present study (see Measures section) were adapted to *over the last two weeks* for

consistency across study measures and to correspond with the program delivery timeline. While the program was mandatory for students, their participation in the described evaluation study was voluntary.

A quasi-experimental design was employed whereby a first cohort of pre-service teachers served as a comparison group and completed measures during the Winter 2018 semester but did not participate in the program. A second cohort of pre-service teachers then served as the program group, completing the program and all measures during the Fall 2019 semester. Data collection took place longitudinally, with surveys administered over three time points for both groups: at the beginning of the semester (T1/pre), six weeks later for both groups, immediately at the end of the program for the program group (T2/post), and four weeks after the end of the program (T3/follow-up). Pre- and post-program printed questionnaires were completed in class, while follow-up measures were administered online. Participants were compensated up to $35 for their completion of the program evaluation.

Measures

Demographics Questionnaire

A demographics questionnaire included questions about participants' general demographic information (i.e., age, gender, race/ethnicity, school level).

Perceived Stress

The 10-item Perceived Stress Scale (PSS; Cohen et al., 1983) includes statements such as, "How often have you felt difficulties were piling up so high that you could not overcome them?" and, "How often have you felt nervous and stressed?" Items are rated on a 5-point Likert scale (1 = *Never*, 5 = *Very Often*). The PSS has been shown to have good internal ($\alpha = .89$) and test-retest reliability (.85) among a sample of college students, as well as good construct validity

and predictive validity with reports of physical and psychological symptoms (Cohen et al., 1983). The PSS demonstrated good internal consistency in this study (α = .87, .88, and .89 at T1, T2, and T3, respectively).

Coping Self-Efficacy

The 26-item Coping Self-Efficacy Scale (CSES; Chesney et al., 2006) assesses one's confidence in their ability to engage in effective coping behaviours in the face of challenges. Each item represents a specific coping behaviour (e.g., "Find solutions to your most difficult problems," "See things from the other person's point of view during a heated argument") and is rated on an 11-point Likert scale (0 = *Cannot do at all*, 10 = *Certainly can do*). The CSES subscales demonstrate good internal reliability (α = .80 to .91) and test-retest reliability (.49 to .81). Construct and predictive validity for this measure is also supported through positive correlations with measures of optimism, social support, and negative correlations with reports of stress, anxiety, and burnout (Chesney et al., 2006). The CSES demonstrated excellent internal consistency in the present study (α = .94, .95, and .96 at T1, T2, and T3, respectively).

Anxiety

The 10-item Trait Anxiety Scale (STAI-10) from the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983) assesses general anxiety and includes items such as, "I feel nervous and restless" and "I feel secure." Items are rated on a 4-point Likert scale (0 = *Almost never*, 4 = *Almost always*). The trait measure has been shown to have excellent test-retest reliability (.97) among a sample of university students as well as strong construct and discriminant validity in validation studies (Metzger, 1976; Spielberger & Vagg, 1984). The STAI-10 demonstrated good internal consistency in the present study (α = .81, .83, and .81 at T1, T2, and T3, respectively).

Mindfulness

The 15-item Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) includes statements such as, “I find myself preoccupied with the future or the past,” and, “I find myself doing things without paying attention,” rated on a 6-point Likert scale (1 = *Almost always*, 6 = *Almost never*). The MAAS was found to show strong internal reliability (α = .80 to .90), as well as high test-retest reliability, convergent and discriminant validity (Brown & Ryan, 2003). The MAAS demonstrated good internal consistency in the present study (α = .85, .86, and .91 at T1, T2, and T3, respectively).

Mental Health

The 14-item Mental Health Continuum Short Form (MHC-SF; Keyes et al., 2008) includes items such as, “How often did you feel interested in life?” and, “How often did you feel satisfied with life?” measured on a 6-point Likert scale (0 = *Never*, 5 = *Everyday*). The MHC-SF has shown good internal reliability (α = >.80) and construct validity in when used in samples of both adolescents and adults (Keyes, 2009). The MHC-SF demonstrated excellent internal consistency in the present study (α = .92, .94, and .94 at T1, T2, and T3, respectively).

Well-Being

Program group only: The 14-item Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007) includes statements such as, "I've been feeling good about myself," and, “I’ve been feeling optimistic about the future,” rated on a 5-point Likert scale (1 = *None of the time*, 5 = *All of the time*) according to participants’ experience over the past two weeks. The WEMWBS has demonstrated good internal reliability with both student (α = .89) and general population samples (α = .91) and was found to be psychometrically robust in validation studies (Stewart-Brown et al., 2011; Tennant et al., 2007). The WEMWBS demonstrated

excellent internal consistency in the present study (α = .90, .91, and .92 at T1, T2, and T3, respectively).

Positive and Negative Affect

Program group only: The *Positive and Negative Affect Schedule* (PANAS; Thompson, 2007) comprises two 10-item subscales, each corresponding to positive or negative affect. Each subscale includes a list of emotions (e.g., "interested", "excited", "distressed", "upset") rated on a 5-point Likert scale (1 = *Very slightly or not at all*, 5 = *Extremely*) based on the extent to which participants felt each emotion over the past two weeks. The PANAS has adequate internal reliability (α =.78 and .76 on the positive affect and negative affect scales, respectively) and has demonstrated convergent validity with measures of subjective well-being and happiness (Thompson, 2007). In the present study, both subscales had adequate to good internal consistency (positive affect: α = .84, .86, and .86 at T1, T2, and T3, respectively; negative affect: α = .67, .70, and .69 at T1, T2, and T3, respectively).

Teacher Self-Efficacy

Program group only: The Teacher Self-Efficacy questionnaire (TSE; Schwarzer et al., 1999) is a brief measure of teachers' perceived sense of efficacy within their profession. This measure consists of 12 items assessing individuals' degree of identification with statements such as "*I am confident in my ability to be responsive to my students' needs, even if I am having a bad day*" on a 4-point scale from *not at all true* to *exactly true.* The TSE has shown good internal reliability (α = .76 to .82) and test-retest reliability (.67 to .76). Discriminant and construct validity of the measure was also supported through negative correlations with job strain and burnout (Schwarzer et al., 1999; Schwarzer & Hallum, 2008). In the present study, this measure demonstrated good internal consistency (α = .82, .84, and .85 at T1, T2, and T3, respectively).

Program Evaluation

Program group only: A program evaluation questionnaire was developed for the purpose of this study and was informed by the Kirkpatrick model of program evaluation (Kirkpatrick & Kirkpatrick, 2016). This measure assesses participants' (1) *response* to the program such as the degree to which they rate the content to be relevant and engaging (e.g., *I found the information presented in this program was relevant and met my expectations* where participants indicate degree of agreement on a 5-point Likert scale from *strongly disagree* to *strongly agree*), (2) acquired *learning* as a function of taking part in the program (e.g., *After participating in this stress-management and well-being program, I feel I learned* where participants indicate amount of learning on a 4-point Likert-scale including *nothing, a small amount, a medium amount*, and *a lot)*, and (3) anticipated changes in *behaviour* such as the intention to apply the knowledge and skills acquired (e.g., participants indicate likelihood of using strategies presented in the program on their own and/or with their students on a 5-point Likert scale from *not at all likely* to *very likely*).

Data Analysis

For the first study objective, program effectiveness was assessed through a series of two-way mixed ANOVAs to examine the effect of time (pre, post, follow-up) and group (program, comparison) on key outcome measures including stress, coping self-efficacy, anxiety, mindfulness, and mental health. One-way ANOVAs were conducted to examine simple main effects of time and group where the Bonferroni correction was used for pairwise comparisons to account for multiple comparisons. For objective 2, one-way repeated measures ANOVAs were conducted to examine potential change over time (pre, post, follow-up) for well-being, positive and negative affect, and teaching self-efficacy outcomes in the program group. Lastly, in terms

of the third study objective, program acceptability was assessed using frequency distributions of participant responses to acceptability and strategy use items at post and follow-up.

Results

Participant Demographics

Participant demographic characteristics including age, gender, and whether they were in the elementary or secondary B.Ed. stream are presented in Table 1.

Program Effectiveness

Objective 1: Group differences (program vs comparison) over time (pre-, post-, follow-up) on outcome measures (stress, anxiety, coping self-efficacy, mindfulness, mental health).

As presented in Table 2, significant interactions by time and group were found for stress (η_p^2 =.05), anxiety (η_p^2 =.07), coping self-efficacy (η_p^2 =.02), and mindfulness (η_p^2 =.10) supporting study hypotheses (H1a-d) although the interaction term was not significant for mental health (H1e). As hypothesized, the program group reported decreased stress and anxiety, as well as increased coping self-efficacy and mindfulness over time in relation to the comparison group (see Table 2). Results from pairwise comparisons (see Figure 1) revealed different patterns across outcomes over time. Specifically, (a) coping self-efficacy significantly increased in the program group and decreased in the comparison group between T2-T3, (b) stress and anxiety both decreased in the program group over time but stayed stable across timepoints in the comparison group, and (c) mindfulness increased over time in the program group between T2-T3 and decreased in the comparison group between T1-T2. In addition, the observed significant improvements in stress, coping self-efficacy, mindfulness, and anxiety within the program group were found to largely emerge at T3 whereas only anxiety showed a significant decrease between T1 and T2 for the program group.

Objective 2: Change over time (pre, post, follow-up) on outcome measures (well-being, affect, teacher self-efficacy) for the program group.

Significant changes over time were found for all outcomes which include increased well-being (η_p^2 =.10), positive affect (η_p^2 =.08), and teacher self-efficacy (η_p^2 =.16), as well as decreased negative affect (η_p^2 =.08). Thus, all hypotheses (H2a-d) pertaining to the second objective were supported given significant changes in the hypothesized direction across the outcomes listed above. For all outcomes, pairwise comparisons to locate differences between timepoints revealed that changes occurred entirely between T1 and T3 as well as T2 and T3 whereby no change was detected between T1 and T2 timepoints. The results of the ANOVA and pairwise comparisons with the Bonferroni correction are presented in Table 3.

Program Acceptability

Objective 3: Satisfaction with the program in terms of reported learning, general response, and reported/intended changes in behaviour.

Participants within the program group rated the acceptability of the program very highly as demonstrated in Table 4. Specifically, a large majority indicated having learned *a medium amount* or *a lot* at T2 (89.8%) and at T3 (88.0%). Similarly, a majority of participants either *agreed* or s*trongly agreed* that the program presented valuable strategies and techniques (82.4% at T2; 82.7% at T3) and that they would recommend the program to other pre-service teachers (78.9% at T2; 81.2% at T3). Participants indicated that they were *likely* or *very likely* to continue using the strategies presented in the program for themselves (79.6% at T2; 76.7% at T3) and with their students (64% at T2; 63.2% at T3) following program completion. Lastly, the program was rated as *good* or *excellent* by 79.5% of participants at post and 84.5% at follow-up.

Discussion

The present study sought to evaluate the effectiveness and acceptability of a curriculum-embedded, skills-based stress management and well-being program for pre-service teachers within a large Canadian university. Findings indicated support for the effectiveness of the program as demonstrated by significant improvements in a number of well-being indices over time in contrast to a comparison group. The observed changes resulting from program attendance include significant decreases in reports of stress, anxiety, as well as significant increases in coping self-efficacy and mindfulness. Participants who took part in the program also reported higher well-being, positive affect, and teacher self-efficacy as well as lower negative affect following program attendance. Interestingly, the majority of the observed benefits emerged at follow-up compared to post-program, which suggests the importance of time needed to both digest the instructional content within the program as well as engage with the strategies at one's own pace. Furthermore, participants reported high satisfaction with the program content and practices. Specifically, the highest two evaluation options were endorsed by more than 85% of pre-service teachers on key satisfaction items pertaining to their acquired learning and general rating for program content including the value of techniques presented.

The present findings contribute to the body of evidence demonstrating the effectiveness and acceptability of embedding stress management and well-being instruction in teacher education. This is significant since rigorous empirical evaluations of stress and well-being related programs for pre-service teachers are currently scarce (Birchinall et al., 2019). Importantly, existing research which examined pre-service teacher outcomes following their participation in other skills-based resilience building interventions reported positive psychosocial and well-being related benefits in qualitative (e.g., Olsen, 2017; Woloshyn & Savage, 2018),

quantitative (e.g., Hue & Lau, 2015; Vesely et al., 2014), and mixed-methods studies (e.g., Beers Dewhirst & Goldman, 2018). For example, Vesely et al. (2014) evaluated an emotional intelligence program for pre-service teachers and reported significant improvements in domains related to emotion regulation, although no changes were reported for stress, anxiety, or well-being following the program (Vesely et al., 2014). Similarly, in a pilot study examining the impact of a mindfulness-based program for pre-service teachers, Hue and Lau (2015) reported significant increases in mindfulness and well-being among pre-service teachers following the program, although no changes were reported for stress or anxiety. When contrasting group means of factors that were assessed using the same measures, stress and mindfulness scores within our study were comparable to those reported by Hue and Lau (2015), although lower means for stress were reported by Vesely et al. (2014). The significant improvements for stress, anxiety, coping self-efficacy, and mindfulness over time as a function of the present program builds on existing research to demonstrate feasibility of improving a breadth of pre-service teachers' individual outcomes through targeted skills-based stress-management and well-being instruction.

Overall, the contributions of this research to the literature are threefold: the study findings (1) provide evidence for the effectiveness of the program as demonstrated by broad scope of benefits for pre-service teachers, (2) indicate high levels of participant satisfaction with the program, and (3) demonstrate feasibility of embedding a brief (six-hour) program as a mandatory part of the B.Ed. without disrupting the curriculum. While evidence of effectiveness of similar scope has been reported following programs for in-service teachers (Benn et al., 2012; Jennings et al., 2013, 2017; Roeser et al., 2013; Schussler et al., 2018), to date, only limited changes in assessed outcomes have been observed for programs targeting pre-service teachers (Hue & Lau,

2015; Vesely et al., 2014). Furthermore, previous programs demonstrating effectiveness are often time- and resource-intensive and are therefore less feasible to be embedded within teacher education. Lengths of skills-based programs with the general population vary widely and key considerations for time and intensity need to be taken into account for effective and efficient delivery (Birchinall et al., 2019). Thus, the present findings, which depict a broad scope of benefits following a brief program that was delivered as a mandatory requirement within the B.Ed., are extremely encouraging. This study is unique in demonstrating both the effectiveness and acceptability of the program content, as well as the feasibility of the embedded delivery approach.

Finally, the present overwhelmingly positive findings are likely partially due to the integration of strategy use (instruction and guided practice) for both pre-service teachers' personal use and for their use in the classroom, making the program particularly useful as professional development for pre-service teachers even if they personally felt they were coping well. Although this was not directly examined in the current study, anecdotally participants indicated that they appreciated the strategy tips for use with their students with a majority indicating willingness to continue using the presented strategies with their students in the future.

Implications for School Psychologists

Although replication of findings is needed, the present study has implications for school staff including school psychologists. For approximately two decades, research has called for the extension of the scope of school psychology practice to include more system-level, preventative work beyond traditional assessment and individual consultation, in alignment with contextual needs (Fagan, 2000; Hawken, 2006). Specifically, their direct work with educators which may include professional development sessions, coaching, and mentorship can situate school

psychologists as key agents of positive change at a school-wide level (Bradley-Johnson & Dean, 2000; Fabiano et al., 2018; Fagan, 2000; Hawken, 2006). The present study demonstrated that basic instruction on stress management and emotion regulation techniques was welcomed and effective for early career educators. Given the value of collaboration between school psychologists and educators as noted above, these findings suggest that it may be beneficial for school psychologists to support early career educators in their implementation and continued use of stress management strategies in the classroom. Furthermore, it is anticipated that similar foundational instruction on stress management, emotion regulation, and well-being will increasingly become part of teacher education programs. School psychologists would need to be informed and prepared to work in partnership with educators to build low intensity, healthy coping instruction into the classroom and larger school climate.

Limitations and Future Directions

The current findings must be interpreted within the bounds of study limitations. Namely, the follow-up timeline within the present study had to be limited to one month; future studies are needed to examine the program's longer-term impact and effectiveness. In addition, since the present program adopted a two-pronged approach teaching pre-service teachers how to use strategies for themselves and with their students, it would be helpful in a longer duration study to examine the extent and impact of participants' use of strategies in the classroom. Furthermore, the individuals who delivered the present program were members of the team developing the program. It is therefore important to replicate the current study with facilitators who are not part of the program development and/or research team. Another limitation within the present study is the lack of random assignment of participants to program and comparison groups. Data collection took place over separate timelines for the comparison and programs groups with

students in different years of study. This was done given ethical concerns in selecting a subsection of students within the same cohort who would not take part in the program during the evaluation and not receive the stress management instruction. Furthermore, splitting the same cohort into program and comparison groups could have led to cross-group contamination whereby students in the same cohort but separate groups may have spoken to each other about the program content. The lack of random assignment has implications for both the internal and external validity of the present study. For example, the different timeline for data collection across study conditions may be a factor influencing participant reports across outcome measures. Similarly, self-selection to participate in the program evaluation for both groups may indicate that participants had certain expectations around whether they would improve over time on the assessed outcomes. In terms of external validity, this study took place at a single institution and replication studies within other institutions' teacher education programs are therefore warranted. Furthermore, current findings may not generalize to samples where comparison and program group data are collected at the same time and no conclusions related to the external validity of findings can be drawn given the lack of a randomized design and the quasi-experimental nature of the present study. Thus, it is important to interpret the findings of the present study with caution given the limitations discussed above. Replication of efficacy and satisfaction findings using a randomized-controlled design across multiple institutions would be needed to establish generalizability beyond this single institution study. Nevertheless, the present study is an important first step in demonstrating the positive stress and well-being impact of a brief program that was embedded within a standard teacher preparation program at a large institution.

Conclusion

With mental health and well-being a key concern for both teachers and students in schools, we must adequately and informedly equip pre-service teachers with skills to support their own *and* their students' mental health and well-being in the classroom (Atkins & Rodger, 2016; Darling-Hammond, 2006). The present program addresses the long-standing need to integrate mental health and well-being instruction within Canadian teacher education curricula (Harris, 2011; Rodger et al., 2014). The findings of the evaluation further demonstrate that the tested program content is effective in improving a broad scope of well-being outcomes for teacher candidates whereby they also find the information valuable and relevant for their overall training for the teaching profession. The present study thus demonstrates the feasibility and value of effectively embedding stress-management and well-being instruction within a teacher education program to supplement pre-service teachers' preparation for the profession.

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Study 2: Tables and Figures

Table 1

Participant Demographic Information for both Study Groups (Program and Comparison).

	Program (*n* = 157)	**Comparison (*n* = 63)**
	M (SD)	***M (SD)***
Age	22.46 (2.33)	23.51 (1.65)
Gender	***n* (%)**	***n* (%)**
Woman	136 (88.3)	53 (85.5)
Man	18 (11.7)	9 (14.5)
Race/Ethnicity	***n* (%)**	***n* (%)**
White	90 (57.5)	41 (65.1)
South Asian	13 (8.3)	2 (3.2)
Multiple ethnicities	12 (7.6)	0 (0)
East Asian	8 (5.1)	2 (3.2)
Unspecified/Blank	8 (5.1)	6 (9.5)
Middle Eastern/North African/Persian/Armenian	7 (4.5)	4 (6.3)
Black	7 (4.5)	2 (3.2)
Latin America/Hispanic	6 (3.8)	2 (3.2)
European	4 (2.5)	4 (6.3)
First Nations/Metis/Inuit	2 (1.3)	0 (0)
Anticipated teaching level	***n* (%)**	***n* (%)**
Elementary	93 (60.4)	38 (58.1)
Secondary	49 (31.8)	21 (33.9)
Post-Secondary	4 (2.6)	2 (3.2)
Other	8 (5.2)	3 (4.8)

Note: The race/ethnicity categories are based on participants' self-identified responses to an open-ended question which were later categorised for simplicity of reporting. Examples of participant responses and associated categories include: South Asian (e.g., Pakistani, Indian, Vietnamese, Filipino), European (e.g., Portuguese, Greek, Eastern European, Italian), First Nations/Metis/Inuit (e.g., Inuk), Multiple ethnicities (e.g., Japanese-Perurian, Polynesian-Canadian). We acknowledge that the categories reported are broad and not representative of all racial or ethnic identities.

Table 2

S*eries of 2 (Group: Program, Comparison) x 3 (Time: Pre, Post, Follow-up) Mixed Design ANOVAs for Mental Health & Well-Being Outcomes (N = 190)*

Outcome	Time point	Program		Comparison	
		M	***SD***	***M***	***SD***
Stress					
****Int**: $F(1.91,359.20) = 9.63$, $p < .001$, $\eta_p^2 = .049$	Pre	28.91	5.90	18.12	6.80
***MET**: $F(1.89,357.15) = 7.56$, $p = .001$, $\eta_p^2 = .038$	Post	28.61	5.36	18.84	5.99
****MEG**: $F(1,188) = 152.50$, $p < .001$, $\eta_p^2 = .448$,	Follow-up	26.21	5.44	19.23	6.52
Coping Self-Efficacy					
****Int**: $F(1.79,336.62) = 14.42$, $p < .001$, $\eta_p^2 = .071$	Pre	157.72	37.61	151.34	44.31
MET: $F(1.799,339.92) = 727$, $p = .47$, $\eta_p^2 = .004$	Post	161.36	34.98	151.11	47.44
***MEG**: $F(1,188) = 8.01$, $p < .05$, $\eta_p^2 = .041$	Follow-up	168.14	36.55	137.86	48.24
Anxiety					
****Int**: $F(1.97,369.69) = 13.90$, $p < .001$, $\eta_p^2 = .069$	Pre	25.53	4.99	21.82	5.98
****MET**: $F(2,378) = 10.83$, $p < .001$, $\eta_p^2 = .054$	Post	24.10	5.21	22.25	6.87
***MEG**: $F(1,188) = 6.45$, $p < .05$, $\eta_p^2 = .033$	Follow-up	23.03	5.36	22.6	6.33
Mindfulness					
***Int**: $F(1.84,346.172) = 3.13$, $p < .05$, $\eta_p^2 = .016$	Pre	3.74	0.78	2.73	0.84
***MET**: $F(1.83,345.81) = 5.13$, $p < .05$, $\eta_p^2 = .026$	Post	3.71	0.77	2.53	0.84
****MEG**: $F(1,188) = 98.50$, $p < .001$, $\eta_p^2 = .344$	Follow-up	3.87	0.87	2.63	0.94
Mental Health					
Int: $F(1.93,362.31) = 1.29$, $p = 276$, $\eta_p^2 = .007$	Pre	58.33	12.05	43.23	14.01
***MET**: $F(1.93,362.31) = 6.65$, $p < .05$, $\eta_p^2 = .034$	Post	60.08	12.26	44.22	14.96
****MEG**: $F(1,188) = 76.28$, $p < .001$, $\eta_p^2 = .289$	Follow-up	61.80	12.3	44.59	13.87

Note. **Int** = Interaction, **MET** = Main effect of Time, **MEG** = Main effect of Group*, *p <.05, **p<.001*

Table 3

S*eries of one-way repeated measures ANOVAs for additional Mental Health & Well-Being Outcomes among the Program Group (N = 127)*

Outcome (*$p < .05$, **$p < .001$)	**Time point**	**Program**	
		M	***SD***
Well-Being			
**$F(1.78,223.95) = 14.1$, $p<.001$, $\eta_p^2 = .101$	Pre	45.34	7.98
	Post	46.61	7.78
	Follow-up	48.74	8.29
Positive Affect			
**$F(1.87,235.72) = 11.02$, $p <.001$, $\eta_p^2 = .08$	Pre	16.40	3.61
	Post	16.81	3.65
	Follow-up	17.74	3.75
Negative Affect			
**$F(2,252) = 10.46$, $p <.001$, $\eta_p^2 = .077$	Pre	11.51	3.40
	Post	11.10	3.38
	Follow-up	10.10	3.01
Teaching Self-Efficacy			
**$F(2,252) = 23.83$, $p <.001$, $\eta_p^2 = .159$	Pre	31.84	3.64
	Post	32.39	3.80
	Follow-up	33.92	3.59

Note. *$p < .05$, **$p < .001$. Pairwise comparisons using Bonferroni correction
(a) Well-being: T1-T3 ($p<.001$) and T2-T3 ($p<.001$)
(b) Positive Affect: T1-T3 ($p<.001$) and T2-T3 ($p=.001$)
(c) Negative Affect: T1-T3 ($p<.001$) and T2-T3 ($p=.001$)
(d) Teacher Self-Efficacy: T1-T3 ($p<.001$) and T2-T3 ($p<.001$)

Table 4

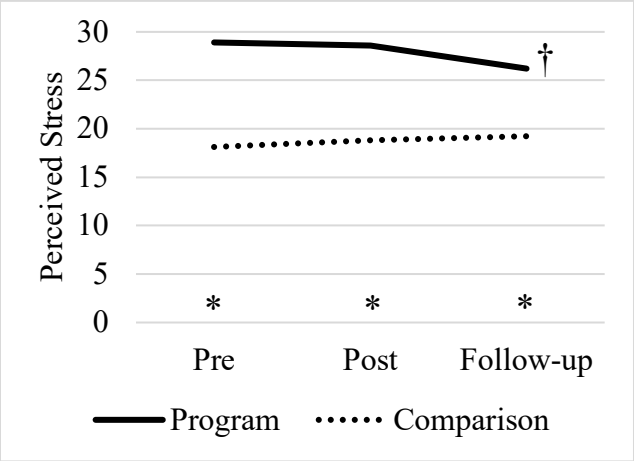
Participant Acceptability of the Stress Management and Well-being Program for Pre-service Teachers and Anticipated Use of Strategies Presented in Program.

	Program Group (N = 157)									
	Post program					Follow-up				
	Nothing	A small amount	A medium amount	A lot		Nothing	A small amount	A medium amount	A lot	
	n (%)	*n* (%)	*n* (%)	*n* (%)		*n* (%)	*n* (%)	*n* (%)	*n* (%)	
After participating in this stress management and well-being program for pre-service teachers, I feel I learned…	2 (1.7)	10 (8.5)	78 (66.7)	27 (23.1)		1 (0.9)	12 (11.1)	66 (61.1)	29 (26.9)	
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
I found the information presented in this program was relevant and met my expectations	4 (2.8)	5 (3.5)	22 (15.5)	83 (58.5)	28 (19.7)	1 (0.7)	4 (2.9)	20 (14.5)	85 (61.6)	28 (20.3)
Overall, the presentations for this program were informative and understandable	1 (0.7)	2 (1.4)	9 (6.3)	70 (49.3)	60 (42.3)	0 (0)	2 (1.4)	11 (8)	73 (52.9)	52 (37.7)
Overall, I found that this program presented valuable strategies and techniques	1 (0.7)	3 (2.1)	21 (14.8)	61 (43)	56 (39.4)	2 (1.4)	4 (2.9)	18 (13)	63 (45.7)	51 (37)
Overall, this program was a valuable professional/personal development experience for me	3 (2.1)	5 (3.5)	21 (14.8)	70 (49.3)	43 (30.3)	3 (2.2)	5 (3.6)	22 (15.9)	60 (43.5)	48 (34.8)
I would recommend this program to other preservice teachers	3 (2.1)	6 (4.2)	21 (14.8)	61 (43)	51 (35.9)	3 (2.2)	6 (4.3)	17 (12.3)	65 (47.1)	47 (34.1)
I would want this program to be a mandatory part of the B.Ed. curriculum	11 (7.7)	10 (7)	30 (21.1)	42 (29.6)	49 (34.5)	7 (5.1)	15 (10.9)	29 (21)	41 (29.7)	46 (33.3)
	Poor	**Satisfactory**	**Neutral**	**Good**	**Excellent**	**Poor**	**Satisfactory**	**Neutral**	**Good**	**Excellent**
How would you rate the program overall?	5 (3.5)	8 (5.6)	16 (11.3)	79 (55.6)	34 (23.9)	1 (0.7)	6 (4.3)	14 (10.1)	86 (62.3)	31 (22.5)
	Not at all likely	**Somewhat Likely**	**Neutral**	**Likely**	**Very likely**	**Not at all likely**	**Somewhat Likely**	**Neutral**	**Likely**	**Very likely**
How likely are you to continue using these strategies for yourself?	2 (1.5)	12 (8.8)	14 (10.2)	72 (52.6)	37 (27)	0 (0)	19 (14.3)	12 (9)	65 (48.9)	37 (27.8)
How likely are you to continue using these strategies with your students?	6 (4.7)	16 (12.5)	24 (18.8)	63 (49.2)	19 (14.8)	6 (4.8)	15 (12)	25 (20)	61 (48.8)	18 (14.4)

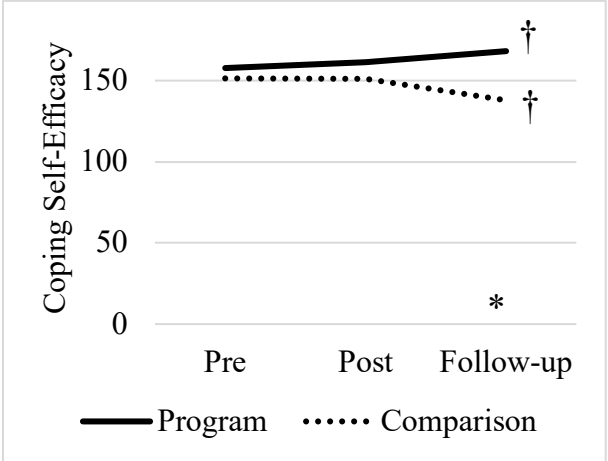
Note. Different *n* between post and follow-up is a result of participant attrition over time.

Figure 1.

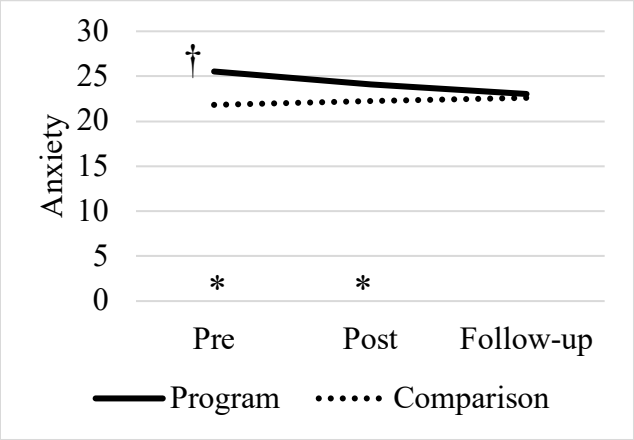
Scores on outcome variables (stress, coping self-efficacy, anxiety, and mindfulness) by time and group; depicting simple main effects of time and group for each outcome.



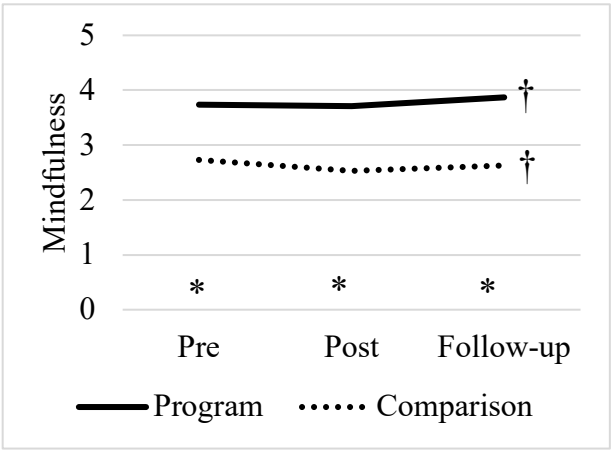
Note. † Denotes simple main effect of time in the program group, $F(1.87,235.65) = 15.78$, $p < .001$, $\eta_p^2 = .111$, T1-T3 and T2-T3 ($p < .016$). * Denotes main effect of condition, program and comparison groups differ on stress at T1 ($p < .001$), T2 ($p < .001$), and T3 ($p < .001$).



Note. † Denotes simple main effect of time in the program group, $F(1.76,222.3) = 7.35$, $p < .01$, $\eta_p^2 = .055$, T1-T3 and T2-T3 ($p < .016$). † Simple main effect of time also observed in comparison group, $F(1.8,111.27) = 7.9$, $p < .001$, $\eta_p^2 = .113$, †T1-T3 and T2-T3 ($p < .016$). * Program and comparison groups differ on coping self-efficacy at T3 ($p < .001$).



Note. † Denotes simple main effect of time in the program group, $F(1.85) = 22.27$, $p < .001$, $\eta_p^2 = .15$, T1-T2, T1-T3, and T2-T3 ($p < .016$). * Denotes simple main effect of condition, program and comparison groups differ on anxiety at T1 ($p < .001$) and T2 ($p < .05$).



Note. † Denotes simple main effect of time in the program group, $F(1.79,225.85) = 4.85$, $p < .05$, $\eta_p^2 = .037$, T2-T3 ($p < .016$). † Simple main effect of time also observed in the comparison group, $F(2,124) = 3.57$, $p < .05$, $\eta_p^2 = .054$, T1-T2 ($p < .016$). * Denotes simple main effect of condition, program and comparison groups differ on mindfulness at T1 ($p < .001$), T2 ($p < .001$) and T3 ($p < .001$).

Bridging to Study 3

Study 2 presented an evaluation of the effectiveness and acceptability of a curriculum embedded stress-management and well-being program within an undergraduate professional degree program. Findings suggest high satisfaction and effectiveness in improving a broad range of mental health and well-being outcomes among university students preparing to enter the teaching profession. These findings are promising given the demonstration of feasibility for effectively embedding stress-management and well-being instruction in a higher education context with minimal impact on existing curriculum responding to calls within research (Arens & Morin 2016; Atkins & Rodger, 2016; Darling-Hammond, 2006; Weston et al., 2008).

While demonstrating efficacy as a brief program with in-person delivery, it remains to be seen whether similar instruction on stress-management and well-being would be effective when delivered to a broader population of university students using technology to facilitate self-directed use. Considering the in-person delivery format of the RESST program for teacher candidates, it would not be feasible to scale up for university-wide delivery given the need for an instructor, therefore an alternative approach to delivery is needed. Systematic and meta-analytic reviews examining the effectiveness of technology-delivered stress-management and well-being programs for university students demonstrate the promise of this approach (Davies et al., 2014; Farrer et al., 2013; Harrer et al., 2018). For example, in a meta-analysis Davies et al. (2014) found improvements for students' stress, depression, and anxiety outcomes across 14 separate trials of web-based interventions targeting student stress, mental health, and well-being. Furthermore, there is emerging evidence for the effectiveness of interventions delivered in a self-directed format (Ahuvia et al., 2022; Chung et al., 2022). Self-directed is an umbrella term referring to programming or resources that are utilized independently, at one's own pace and

discretion. Given the novelty of this field, further research is needed to examine the effectiveness of self-directed use of stress-management and well-being resources in supporting university students' mental health and well-being (Ahuvia et al., 2022).

The overarching objective of Study 3 was to examine the acceptability and effectiveness of a web-based, self-directed collection of resources to support university students' capacity to cope with stress and distress. The resources on the website provided evidence-based strategies and tips for dealing with issues pertinent to university students' mental health and well-being (e.g., managing stress, enhancing performance, adulting, socializing, and well-being). The information was presented in a multi-media format including videos, infographics with links to further resources, audios for guided strategy practice, and worksheets. In addition to examining acceptability and effectiveness of the online resource, Study 3 sought to test a stepped (or tiered) model of resource delivery through the use of a researcher developed screening measure to pre-determine students' level of need for support to direct them to the online resources aligned with their reported level of need. Thus, using a randomized controlled design, Study 3 sought to examine the overall impact (acceptability and effectiveness) of an online self-directed web-based resource for university students as assessed by group differences (directed, non-directed, and comparison) over time (baseline to follow-up) across the outcomes of *stress*, *coping* (i.e., coping self-efficacy, coping behaviours) and *well-being*.

Chapter 4: Study 3

Does it Work? Examining the Acceptability and Effectiveness of a Self-Directed, Web-Based Resource for Stress and Coping in University

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Abstract

University students face high levels of stress with limited support for coping and well-being. Campus mental health services are increasingly using digital resources to support students' stress-management and coping capacity. However, the effectiveness of providing this support through web-based, self-directed means remains unclear. Using a randomised-controlled design, the present study examined the acceptability and effectiveness of a self-directed, web-based resource containing evidence-based strategies for stress-management and healthy coping for university students. The study additionally explored the potential benefits of screening and directing students to personalized resources aligned with their needs. Participants consisted of 231 university students (M_{age} = 21.01; 80.5% women), assigned to one of three groups (i.e., directed to personalized resources, non-directed, and waitlist comparison), and completed pre, post (4 weeks), and follow-up (8 weeks) measures for stress, coping, and well-being. The resource groups also completed acceptability measures at 2, 4, and 8 weeks after the web-based resource access. Results indicate high acceptability, reflecting students' satisfaction with the resource. Furthermore, significant decreases in stress and unhealthy coping as well as significant increases in coping self-efficacy and healthy coping in the resource groups relative to the comparison group were found. Interestingly, the directed approach showed no added benefit over non-directed resource access. In summary, this study demonstrates the acceptability and effectiveness of a self-directed digital resource platform as a viable support option for university student stress and coping.

Keywords: stress; coping; self-directed programming; university students

Introduction

University students consistently report high levels of stress and psychological distress and identify these as key factors that negatively impact their academic performance and engagement with their studies (American College Health Association; ACHA, 2022a, 2022b; Sharp & Theiler, 2018; Stallman, 2010). Supporting students in effectively coping with stress and distress is of critical importance to facilitate learning and development in university environments. To that end, technology-based approaches to delivering stress-management and well-being supports to university students have proliferated on campuses as supplemental means of supporting student stress management, coping capacity, and well-being (e.g., Harrer et al., 2018). Indeed, online resources for students' self-directed use such as websites, apps, or on-demand workshops, are increasingly popular given their benefits in improving access to support as well as the potential for reaching students who may be reluctant to seek other forms of mental health support or are on waiting lists for more specialized services (e.g., Lattie, Adkins, et al., 2019). In addition, the provision of resources for addressing stress and enhancing coping capacity is aligned with the recently proposed health theory of coping which calls for enhancing the availability of evidence-based healthy coping strategies (Stallman, 2020). However, investigation into the acceptability, and even more critically the effectiveness of online, self-directed resources for non-clinical stress-management and healthy coping support is limited. Thus, the present study sought to explore the acceptability and effectiveness of a self-directed, web-based resource for enhancing students' stress-management and coping capacity. Furthermore, the study also examined if there would be any added benefit of screening students to assess stress and coping needs and then directing them to specific resources to match their needs for stress-management and healthy coping support.

University Student Stress and Coping

University students' mental health and well-being has been a growing concern within higher education research and practice for many decades (Brown, 2018; Hill et al., 2020; Van de Velde et al., 2021). The most frequently identified factors impacting academic performance in recent population level surveys (N = 54,204) include stress (43.7%), anxiety (37.3%), depression (27.5%), and sleep difficulties (25.9%; ACHA, 2022a). Within Canada, university students (N = 11,322) identified the same factors; stress (51.5%), anxiety (43.3%), depression (30.4%) and sleep difficulties (31.9%), as having had a negative impact on their academic performance over the past year (ACHA, 2022b). For those pursuing a university education, this time in their lives often corresponds with their developmental transition to adulthood (Conley et al., 2014). Coined in research literature as *emerging adulthood*, this developmental period is distinct from adulthood conceptually and as a subjective experience (Arnett, 2000, 2004; Swanson, 2016; Syed & Mitchell, 2013).

Emerging adulthood is a challenging yet unique time of exploration and settling into adult roles, often characterized as a time of feeling in-between (Arnett, 2000, 2004). The transitional nature of this developmental period has implications for university students' mental health and well-being, as it is also a time where high rates of engagement in risky and unhealthy coping behaviours have been observed (Böke et al., 2019; Bukobza, 2009; Sussman & Arnett, 2014). For example, Böke et al. (2019) found that university students reporting higher stress were more likely to engage in substance-use as a coping strategy. Another university study reported that a problem-focused (i.e., approach) coping style buffered the strong negative impact of stress on well-being (Slimmen et al., 2022). Taken together, there is a clear need to enhance access to evidence-based strategies and tools to support students in effectively managing stress

and enhancing their capacity to cope with distress (Cunningham & Duffy, 2019; Munthali et al., 2023; Slimmen et al., 2022; Stallman et al., 2022).

To enhance coping capacity among university students, understanding their decision-making processes in coping with stress is imperative. The health theory of coping offers a comprehensive framework for conceptualizing how students cope with stress and distress (Stallman, 2020). Stallman's heath theory of coping considers all coping responses as adaptive, emphasizing their short-term efficacy in alleviating momentary stress or distress, and further classifies coping responses into healthy and unhealthy coping behaviors based on the likelihood of adverse consequences. The theory presents a hierarchical model delineating coping responses across intensities, directly corresponding to the intensity of experienced stress or distress (Stallman, 2020; Stallman et al., 2022). Low levels of stress or distress prompt low-intensity coping, encompassing both healthy (e.g., positive self-talk, mindfulness, abdominal breathing) and unhealthy (e.g., negative self-talk, cognitive rumination, suppression) responses. As distress intensifies, coping responses escalate, where higher intensity healthy strategies may include engaging in distracting activities, relaxation, physical exercise, or seeking social/professional support, while unhealthy responses may involve self-isolation, emotional eating, self-harm, substance use, or suicidality (Stallman, 2020). Acknowledging this hierarchical progression is pivotal in designing student support programs tailored to promote the availability of and engagement in evidence-based healthy coping behaviours.

Supporting Stress-Management and Building Coping Capacity

To date, efforts aimed at improving student mental health and well-being in university settings have included a wide variety of interventions targeting stress (e.g., Amanvermez et al., 2021), depression (e.g., Ma et al., 2019), anxiety (e.g., Lattie, Adkins, et al., 2019) resilience

(e.g., Ang et al., 2021), and general mental health and well-being (e.g., Worsley et al., 2022). Increasingly, technology-based and online tools (e.g., websites, apps, chat-bots, on-demand programming) are used with several systematic and meta-analytic reviews emphasizing the promise of the technology-based approach for improving key outcomes (Conley et al., 2015; Davies et al., 2014; Harrer et al., 2018, 2019; Worsley et al., 2022). Furthermore, emerging research demonstrates the promise of sharing resources for students' self-directed use at their own pace and discretion (e.g., Bolinski et al., 2020; Gabrielli et al., 2021; Fleming et al., 2018; Lattie et al., 2019).

For example, Fischer et al. (2020) demonstrated that self-directed interventions were effective in improving well-being and reducing stress, depression, and anxiety among both general population and clinical samples when compared to active and inactive controls. This is supported by two meta-analytic reviews reporting significant effects of self-guided interventions for improving depressive symptoms in general population samples (Cuijpers et al., 2011; Karyotaki et al., 2018). Among university students, a meta-analysis by Bolinski et al. (2020) found online mental health interventions (majority were self-directed) to be effective for reducing anxiety and depression, although only a small and non-significant effect was reported for academic performance. In addition, Chung et al. (2022) examined the effectiveness of a university-wide, self-directed online mindfulness and well-being intervention and found improvements across stress, well-being, and mindfulness outcomes for those who engaged with the intervention over a duration of three or more weeks.

Self-directed or self-administered online resources have the potential to serve as supplementary support for students and offer several advantages. First, they have the potential to reach those who may not access face-to-face services, who may not meet clinical criteria for

specialized treatments or are on waitlists for services, thus broadening access to evidence-based strategies and supports (e.g., Fleishman et al., 2018; Fleming et al., 2018; Karyotaki et al., 2017; Lillevoll et al., 2014). Second, the self-guided format is supportive of student autonomy and confidentiality as individuals can choose when, where, and how to access information and make use of resources most aligned with their individual needs (Fleishman et al., 2018). Lastly, the online presentation of information and evidence-based strategies and techniques allows for a cost-effective, low-intensity, and adaptable (i.e., possibility to update and/or change based on contextual needs) means to supplement existing mental health and well-being services on campus (e.g., Becker & Torous, 2019; Lattie, Adkins, et al., 2019; Oti & Pitt, 2021). Furthermore, studies suggest that this modality is welcomed in universities (Fleishman et al., 2018; Reis et al., 2021) where up to 70% of students in a sample of 1,224 indicated interest in self-guided mental health supports (Ahuvia et al., 2022).

Issues with Supporting University Student Stress-Management and Healthy Coping

Despite the advantages described above and emerging evidence of effectiveness for using online, self-directed approaches to student support, research examining the effectiveness and acceptability of this approach is in its infancy. In addition, it is unclear to what extent online, self-directed programming and resources are integrated into the university setting and utilized beyond their initial effectiveness trials (e.g., Fleming et al., 2018). Notably, even when interventions and programs for student mental health and well-being are proven effective, they are often only shared with students through the universities' health and wellness center, relying on students to proactively seek help to access these services. This poses a challenge because research consistently shows that university students exhibit low levels of help-seeking, leading to the underutilization of many services and resources despite a high demand (Bourdon et al., 2020;

Dunley & Papadopoulos, 2019). Additionally, earlier studies exploring means to support students' stress and coping have focused on addressing one aspect of stress or coping such as mindfulness for stress, or breathing exercises for managing anxiety (e.g., Lakhtakia & Torous, 2022). This signals a need for broader resource covering a wider array of topics and coping strategies to build coping capacity. Taken together, there is an urgent need to explore alternative approaches for resource delivery that facilitate students' universal and ongoing access to self-directed support options to comprehensively address stress and coping needs.

A persistent problem in university and a barrier to students' access to support is low rates of help-seeking, where stigma around mental health difficulties is considered to be a major contributor to students' reluctance to seek support (Dunley & Papadopoulos, 2019; Eisenberg et al., 2011). Emerging research suggests that perceived mental health stigma can also contribute to students' response to the format and modality of stress-management and well-being support delivery (Cho et al., in press). Specifically, Cho et al.'s (in press) intervention study found that students' perceived mental health stigma did not impact their sustained satisfaction with a self-directed modality (i.e., an infographic presenting evidence-based strategies for stress-management and well-being), while it negatively impacted their sustained satisfaction with a live online workshop presenting the same information with the presence of a facilitator (Cho et al., in press). Proactively connecting students to available resources is therefore an important consideration to navigate the effect of mental health stigma on students' help-seeking behaviour and use of support services. One suggested solution for this is the use of brief screening measures to identify students' levels of need for support and recommending existing resources aligned with their personal needs (e.g., Böke et al., 2023; Hasking et al., 2023; Lattie, Adkins, et al., 2019). Indeed, this approach has shown promise in clinical contexts as part of suicide

prevention efforts in university (Hasking et al., 2023; King et al., 2015). For example, in a large-scale study, Hasking et al. (2023) found that the use of a multivariable screener for suicidal risk followed by referral to a stepped telehealth intervention significantly increased resource use among university students classified as having the greatest need for intervention. However, this effect disappeared at a 12-month follow-up where no difference in rates of resource-use was observed between the intervention and control groups (Hasking et al., 2023). Whether screening and tailoring resource recommendations can also promote students' engagement with, and use of, low-intensity stress-management and healthy coping resources in a non-clinical context remains to be explored.

Moreover, there is a need to consider students' uptake of stress-management and healthy coping strategies presented in self-directed resources. In a systematic review of prevention programs for stress, depression, and anxiety in university contexts which included self-administered programming, Rith-Najarian et al. (2019) found inconsistencies in the assessment and reporting of information on uptake and adherence. Specifically, only 57% of the studies included in the review presented any information on adherence and/or completion which prevented the authors from including adherence as a factor within their analyses (Rith-Najarian et al., 2019). A later study examining the effectiveness of a self-directed mindfulness intervention delivered over 12 weeks reported that students access to the program modules peaked during the first three weeks, declined steeply over weeks three to seven and then stabilized with a small increase in the final week 12 (Chung et al., 2022). Overall, the authors reported that 58.7% of their total sample (n = 833) did not access the mindfulness program at all over the duration of the semester-long study (Chung et al., 2022). Assessing and reporting uptake or use of the provided resource is of particular importance in studies examining self-directed

modalities where use can fluctuate over time and where the proportion of zero-uptake may be elevated. Furthermore, rates of uptake or use may influence the accuracy of effectiveness findings and additional research is needed to better understand the relation between program uptake/adherence and outcomes of effectiveness (Rith-Najarian et al., 2019).

The Present Study

In summary, despite the rapid proliferation of online self-guided resources for university students, research examining the effectiveness of this approach for improving stress and coping is still in its infancy. Further research is needed to address gaps and deepen our understanding of what works best and how in the area of supporting university students' stress-management and coping capacity (Lattie, Adkins, et al., 2019; Rith-Najarian et al., 2019). Thus, using a randomized-controlled design, the present study sought to examine the acceptability and effectiveness of a web-based, self-directed resource for university students containing evidence-based strategies for stress-management and healthy coping. In addition, the present study examined whether there would be any added benefit of using a screening approach to direct students to personalized resources aligned with their identified needs. Participants were randomly assigned to one of three groups; directed to personalized resources aligned with needs, non-directed but received all resources, and waitlist comparison. Main outcomes assessed were participant ratings of acceptability, stress, coping (coping self-efficacy and coping behaviours), and well-being over time.

Specifically, the first objective (1) was to examine potential group differences (directed and non-directed resource groups only) in students' acceptability of the web-based resource over time. It was hypothesized that (H1) acceptability would be higher in the directed group when compared to the non-directed over time. The second objective (2) was to examine the

effectiveness of the online self-directed resources in terms of group differences (directed, non-directed, comparison) on outcome measures (i.e., stress, coping, and well-being) and in terms of differences in scores over time between baseline, post, and follow-up measures. It is hypothesized (H2a) that the directed group will show stronger improvements across stress, coping, and well-being outcomes over time than both the non-directed group and the comparison group. It is also hypothesized (H2b) that the non-directed group will show significant improvements across study outcomes relative to the comparison group. Lastly, the third objective (3) was to examine the effectiveness of the overall web-based, self-directed resource in terms of group differences (resource group; merged directed and non-directed versus the comparison group) on outcome measures and in terms of change in scores over time between baseline, post, and follow-up measures (i.e., stress, coping, and well-being). It is hypothesized (H3) that the resource group will show significant improvements across study outcomes in relation to the comparison group.

Method

Participants

Participants consisted of 231 university students recruited across a large university (80.5% women; M_{age} = 21.01). Participants were randomly assigned to one of three study groups (directed: n = 78, 83.3% women; M_{age} = 21.18; non-directed: n = 77, 80.5% women; M_{age} = 21.06; comparison: n = 76, 77.6% women; M_{age} = 20.79).

Resource Development and Content

The development of the web-based resource examined in the present study was informed by three key foundational frameworks; namely, the health theory of coping (Stallman, 2020), the theory of emerging adulthood (Arnett, 2000, 2004), and Stepped-Care2.0 (Cornish, 2020;

Cornish et al., 2017). Specifically, the health theory of coping provides a conceptual framework depicting university students' approaches to coping with stress and distress across a hierarchical spectrum where the intensity of the coping behaviour is proportional to the intensity of experienced distress (Stallman, 2020). The theory of emerging adulthood and research describing general characteristics of this developmental period were instrumental in informing the topics and content developed and presented within the online resource (Arnett, 2000, 2004). Lastly, Stepped-Care2.0 (SC2.0; Cornish, 2020; Cornish et al., 2017) presents a stepped, hierarchical framework for the organization of campus mental health care and services across incremental steps of intensity. The resource tested within the present study aligns with the lower intensity steps within SC2.0 and the framework has influenced and informed the screening and referral to personalized resources (i.e., directed vs non-directed) model tested within the present study. In addition, resource development followed a collaborative approach with a large team of university students (undergraduate and graduate), researchers, and university mental health service professionals consulting at each project stage (e.g., conceptualization, material development, implementation, and data collection).

Overall, the theoretical foundations described above, environmental scan of best-practices in digital resource creation, as well as consultations with the project team informed the scope of topics and content areas to create research-informed resources with evidence-based strategies and tips. For example, students particularly requested resources for topics such as dealing with breakups, managing household responsibilities, managing stress around finances, setting and maintaining boundaries, and building social connections, among others. A priori, it was determined that resources would be presented in several multimedia formats (i.e., text, audio, video, interactive infographic) to account for diversity of preferences. In sum, there were

over 50 different resources developed to highlight evidence-based strategies for healthy coping addressing a broad scope of topics relevant for emerging adult university students in a demanding academic context. All resources were grouped in five main categories: *Managing Stress*, *Enhancing Performance*, *Adulting*, *Socialising*, and *Well-being*. Additionally, a psychoeducation and information-based section titled *Understanding* was created to share general statistics and information pertaining to university student stress, mental health, and well-being. The website also presented an *Additional Resources* section to connect students to, and encourage their use of, other services and resources they are eligible for at the university, in the local community, and through other websites and apps. An overview of all content presented on the website is detailed in Appendix D.

Procedure

Participants who expressed interest in participating in the study were asked to complete a brief online demographics survey to facilitate their random assignment into the three different conditions within the study; namely, directed to resources based on reported need in the screening questionnaire (Group 1: directed), non-directed sharing of all resources (Group 2: non-directed), and waitlist comparison (Group 3: comparison). Responses to the demographic questionnaire were used to ensure comparable samples across the different conditions in terms of participants' age, gender, and program of study. Following random assignment to the different conditions, all participants were asked to complete the baseline measures and the screening questionnaire (described in the measures section below). Although all participants were asked to complete the brief screening questionnaire, only those in the directed group subsequently received personalized instruction on how to use the resources and strategies provided in the online resource.

Group 1 (Directed)

Immediately following the completion of the baseline survey, Group 1 were given access to the website presenting a collection of stress-management, motivation, healthy coping, well-being, and socializing resources. Additionally, based on their answers to the brief screener, Group 1 were directed to one of three unique pages on the website based on their responses on the screening questionnaire demonstrating low, moderate, or high need for support around stress and coping. The directing process was automated using a scoring algorithm within the survey platform used in the present study (i.e., Qualtrics). Details on the screening question, algorithm, and cut-off scores are provided in Appendix D.

Group 2 (Non-directed)

Participants in Group 2 followed the same procedure as Group 1; however, they did not receive any personalized instruction and were simply directed to the home page of the website containing resources.

Group 3 (Comparison)

Participants in Group 3 constituted the waitlist comparison group. As such, they did not have access to any of the strategies hosted on the website during the data collection phase of the study. Participants in Group 3 were asked to complete online surveys identical to those completed by Groups 1 and 2. Although Group 3 did not have access to the strategies during the project, the full web-based resource was shared with the comparison group at the end of data collection.

In terms of data collection timeline, all groups completed measures (detailed in the next section) regarding their stress, coping, and well-being at the start of the study (Baseline: T1), four weeks after the start of the study (Post: T2), and eight weeks following the start of the study

(Follow-up: T3). In addition, participants in Groups 1 and 2 completed a brief check-in to assess resource acceptability two weeks after baseline which is when the resources were initially shared with participants.

Measures

Screening

The purpose of this screening questionnaire was to assess students' varying levels of need for support around stress, distress, coping self-efficacy, loneliness, and social support to enable the directing of the Group 1 (directed) to resources that match their need for stress-management and healthy coping support. This screener consisted of a 24-item researcher-designed measure comprised of a mix of single items assessing coping behaviours, financial stress, and access to community, as well as short versions of standardized measures that have been shown to be associated with university students' overall adjustment and well-being including, perceived stress (Cohen et al., 1988), coping self-efficacy (Chesney et al., 2006), loneliness (Russell et al., 1980), social support (Zimet et al., 1988), and social connectedness (Armstrong & Oomen-Early, 2009). Participants in the directed group were categorized as indicating high, moderate, or low need for stress-management and coping support based on their scores on the researcher developed screening questionnaire and were subsequently directed to unique pages of the web-based resource. The scoring and categorization algorithm is described in Appendix D and the distribution of high, moderate, and low need categories is provided in Table 1. In terms of the pages they were directed to, those scoring in the high need category were directed to comprehensive resources for stress and coping support in the community, crisis lines, as well as specific help-seeking strategies. Those indicating moderate need for support were directed to the full web-based resource and encouraged to use the presented strategies. Lastly, those indicating

low need for support were directed to the *Understanding* section of the website to provide further information around stress and coping as well as a list evidence-based stress-management and healthy coping strategies for their quick use in the event they feel a need. Comprehensive details of the screening questionnaire, algorithm to facilitate directing, as well as the recommendations corresponding to low, moderate, and high need are presented in Appendix D.

Acceptability

Participants' ratings of the acceptability of the resources and strategies shared was assessed using a researcher-developed measure aligned with the Kirkpatrick New World Model for program evaluation (Kirkpatrick & Kirkpatrick, 2016). Specifically, a total of 11 items assessed participants' (1) overall satisfaction with the resource (8 items; e.g., "*I found the website useful for me"*; "*The strategies presented in the website helped me better understand how to manage my stress and improve my wellness"; "I found that the website presented valuable strategies and techniques"* rated on a 4-point Likert scale; 1= *strongly disagree* to 4= *strongly agree*), (2) frequency of actual and planned use of strategies (2 item; i.e., "*Over the past two weeks, how often did you use the strategies presented on the website?"* and *"Over the coming weeks, how often do you plan to use the strategies presented on the website?"* Rated on a 4-point Likert scale; 1 = *every day* to 4= *never)* as well as (3) a single item to rate perceived impact for their well-being (i.e., "*Over the past two weeks, how would you rate the impact of the strategies presented on the website on your well-being?"* Rated on a 4-point Likert scale; 1= *no impact* to 4= *high impact*). Scores were summed for the first part of the measure depicting satisfaction (i.e., items 1-8), the remaining items (actual and planned strategy use, impact on well-being) were analysed as single item responses. Internal consistency of the satisfaction subscale was good in the present study (α = .88, .85, .87 at 2 weeks post baseline, T2, and T3,

respectively). The complete version of the acceptability questionnaire is presented in Supplemental Materials.

Stress

Participants perceived level of general stress was assessed using the 10-item version of the Perceived Stress Scale (PSS; Cohen et al., 1983). This measure is a widely used self-report measure of adults' perception of stress. The items ask participants to indicate their experience of stress and the degree to which life situations are stressful on a 5-point scale; 0= *never* to 4= *very often*. Items include statements such as "*In the last two weeks, how often have you felt difficulties were piling up so high that you could not overcome then?*" and "*In the past two weeks, how often have you felt nervous and stressed?*" Higher scores on the PSS represent greater perceived stress. The PSS has adequate internal reliability, construct validity, and predictive validity with reports of psychological and physical symptoms, and the use of health services (Cohen & Williamson, 1988). Although the original measure asks participants to report perceived stress over the last month, the measure was adapted in the present study for consistency of timeline across measures, therefore, the prompt was adapted to ask that participants report their perceived stress over the past two weeks. The internal consistency of the PSS in the present study was good (α = .83, .84, .85 at T1, T2, T3, respectively).

Coping

Participants' belief in their ability to cope with general difficulty and distress was assessed using the Coping Self-Efficacy scale (CSE; Chesney et al., 2006). The CSE is a measure of one's confidence in effectively engaging in coping behaviours in the face of challenges. There are 26 items and three subscales within the CSE; namely, problem-focused coping (12 items), emotion-focused coping (9 items), and social support (5 items). Participants

are asked to rate their confidence in their ability to perform the listed coping behaviours (e.g., "*find solutions to your most difficult problems*", "*see things from the other person's point of view during a heated argument*") on an 11-point Likert scale; 0= *cannot do at all* to 10= *certainly can do*. Higher scores on the CSE represent greater belief in one's own ability to cope with difficulty. The CSE demonstrated negative correlations with perceived stress, burnout (Chesney et al., 2006), and emotion regulation difficulties (Luberto et al., 2014). Conversely, the CSE is positively correlated with optimism (Chesney et al., 2006). In the present study, the prompt for this measure was adapted to ask participants about their confidence in their ability to perform the listed coping behaviours specifically over the past two weeks and the internal consistency of the full CSE was excellent (α = .93, .95, .95, at T1, T2, T3, respectively).

In addition, the Coping Index (CI; Stallman, 2017) was used to assess students' engagement in healthy and unhealthy coping behaviours over the duration of the study. The CI is a 20-item measure of engagement with healthy (10 items) and unhealthy (10 items) coping behaviours which are aligned with the health theory of coping framework (Stallman, 2020). The measure consists of items that list common healthy and unhealthy coping behaviours such as "*talk things over with family or friends*", "*do relaxing activities",* or "*have negative self-talk*". Participants are asked to indicate how often they engage in each behaviour listed when they feel stressed or distressed on a 4-point Likert scale (0= *I don't do this at all* to 3= *I do this most of the time*). Higher scores on the healthy coping subscale indicate greater frequency of engagement in healthy coping behaviours, similarly, higher scores on the unhealthy coping subscale indicate greater frequency of engagement in unhealthy coping in response to stress or distress. This measure has been found to have satisfactory test-retest reliability in previous studies (α = .71; Stallman, 2019). In the present study, internal consistency of the healthy coping subscale was

poor (α = .57, .57, .64 at T1, T2, T3, respectively) and the unhealthy coping subscale was also poor (α = .53, .53, .58 at T1, T2, T3, respectively). This is expected and deemed borderline acceptable for research purposes (Meyers et al., 2017) given that the items within the subscales of the CI assess unique coping behaviours that may not necessarily have high agreement between them.

Well-Being

Well-being was assessed using the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007). This measure consists of 14 positively worded items assessing overall subjective well-being. Participants are asked to rate statements such as "*I've been feeling good about myself*" according to their experience over the past two weeks on a 5-point Likert scale' 1= *none of the time* to 5= *all of the time*). A higher WEMWBS score represents a higher level of mental well-being. The WEMWBS has demonstrated good internal consistency within university student (α = .89) and general population samples (α = .91). Test-retest reliability after a one-week delay was also high (.83; Tennant et al., 2007). The internal consistency of the WEMWBS in the present study was excellent (α = .91, .92, .93 at T1, T2, T3, respectively).

Data Analytic Plan

The overarching purpose of the study was to examine the acceptability and the effectiveness of a self-guided online resource for university student stress, coping, and well-being outcomes. Preliminary analyses (i.e., a one-way ANOVA, Chi-square tests) were conducted to ensure comparability of the three study groups on demographic variables such as age, gender, and faculty of study at baseline. Given the importance of actual engagement with the online resource for the accurate assessment of acceptability (e.g., Rith-Najarian et al., 2019),

the analyses of acceptability (Objective 1) were conducted both within the full study sample and a subsample of participants consisting of those who reported using the resources at least sometimes across all timepoints. Preliminary descriptive statistics were computed to examine students' satisfaction with the online resource, their reported and intended use of strategies, and the perceived impact of using the strategies for their well-being among both the directed and non-directed groups. Group differences in satisfaction and strategy use ratings were examined using a series of two-way mixed design ANOVAs to examine the effects of condition (directed vs non-directed delivery of resources) and time (baseline, post, follow-up) on student ratings of satisfaction and strategy use, as well as the reported impact of strategy use for their well-being. Across all analyses, the Bonferroni correction was used across at the level of main effects, simple main effects, and pairwise comparisons to account for multiple comparisons.

Notably, there were a total of 35 (14.46% of the total sample) participants (M_{age} = 22.00, *SD* = 3.48, 78.9% women) in the resource groups that reported never using the presented online resource and strategies. In a resource evaluation study, those who were assigned to a resource group but chose not to engage with the resource cannot comment on the resources, nor would we expect the resources to effect a change and this data may interfere with the accurate evaluation of effectiveness of the resources. Compared to students who reported using the strategies (*n* = 177), those who reported never using the strategies (*n* = 35) were not significantly different on any of the study variables (stress, coping, well-being) at baseline. Therefore, those who reported never using the strategies were excluded from the subsequent analyses which were only conducted among the subsample of participants who reported using the resource at least sometimes across the three timepoints (directed: *n* = 54, M_{age} = 20.70, *SD* = 1.79, 81.5% women; non-directed: *n* =

49, M_{age} = 21.04, *SD* = 3.208, 83.7% women; comparison: *n* = 74, M_{age} = 20.81, *SD* = 2.19, 79.7% women).

Thus, for the accurate assessment of effectiveness (Objective 2), analyses were restricted to the subsample consisting of participants who reported at least some use of the online resource across the study timeline. A series of 3 (Condition: directed, non-directed, waitlist comparison) x 3 (Time: baseline, post, follow-up) mixed-design ANOVAs were used to examine potential changes in stress, coping, and well-being over time.

Lastly for Objective 3, which sought to examine the overall effectiveness of the online resource against a business-as-usual comparison group, the directed and non-directed groups were merged into one "*resource group"* to facilitate this analysis. A series of 2 (Condition: resource group, waitlist comparison) x 3 (Time: baseline, post, follow-up) mixed-design ANOVAs were used to examine potential changes in stress, coping, and well-being over time. Across all analyses, follow-up examination of main effects and simple main effects of group and time were conducted to locate any observed differences by group or over time. Bonferroni corrections were used across main effects and simple main effects analyses to account for multiple comparisons. IBM SPSS version 23 was used for all analyses in the present study.

Results

Preliminary Analyses

Participants were randomly assigned to the directed, non-directed, and comparison groups following their completion of the demographic questionnaire. A one-way ANOVA revealed no differences based on age across the study groups, $F(2, 229) = .139$, $p = .870$. Two Chi-square tests of independence revealed no associations across the groups by gender, $X(6) = 5.878$, $p = .437$, or faculty of study, $X(22) = 18.266$, $p = .690$. Thus, efficacy of the

randomization and comparability of the study groups was supported. A total of 19 participants were excluded from all analyses given that most of their online survey was incomplete. Missing values analyses demonstrated less than 5% of missing data within each timepoint and group, which were imputed using the Expectation Maximization method. There were 4 univariate outliers identified ($z > |3.29|$) which were winsorized for data conservation. Thus, the final study sample consisted of 212 participants (M_{age} = 21.06, SD = 2.67, 81.6% women). As noted above, the present study also considered the subsample of participants who reported at least some use of the strategies shared on the web-based resource. Demographic characteristics and screener scores of both the full sample and the subsample of participants are displayed in Table 1. Interestingly, participants' scores on the screener indicate either low or moderate need for stress-management and healthy coping support with no participant scores signaling high need. The proportion of low versus moderate need, as indicated by screener scores, were comparable across all study groups (directed, non-directed, comparison).

Objective 1: Acceptability of the Self-Directed Online Resource as Assessed by Group Differences (Directed vs Non-directed) Over Time (Baseline to Follow-up) on Overall Resource Satisfaction, Actual and Planned Strategy Use, and Perceived Impact on Well-Being.

Participants in both the directed (Group 1) and non-directed (Group 2) conditions rated the online resource very highly with specific ratings across the acceptability questionnaire for each group across time depicted in Tables 2 and 3. Overall, participants indicated that the strategies presented in the online resource were valuable (90% and 92% agreed in Groups 1 and 2 respectively), presented in an engaging manner (83% and 86% in Groups 1 and 2 respectively), and easy to understand (93% and 94% in Groups 1 and 2 respectively). Similarly, up to 83% of

those in the directed group and 79% of those in the non-directed group agreed that the strategies presented helped them better understand how to manage their stress and improve their wellness.

A two-way mixed design ANOVA to assess group differences over time for overall satisfaction with the online resource (sum score of acceptability items 1 to 8) revealed no significant group by time interaction; $F(1.764, 206.390) = .015$, $p = .977$, $\eta_p^2 = .000$ (Table 4). Similarly, no interactions were found for strategy use, $F(1.793, 208.039) = .204$, $p = .792$, $\eta_p^2 = .002$; planned strategy use, $F(2, 232) = 1.554$, $p = .214$, $\eta_p^2 = .013$; and perceived impact of strategy use on well-being; $F(2, 234) = .067$, $p = .928$, $\eta_p^2 = .001$. Analyses of main effects revealed no significant changes in strategy use over time using the Bonferroni correction; $F(1.793, 208.039) = 3.576$, $p = .034$, $\eta_p^2 = .030$. Similarly, there was no significant main effect of time for participants' ratings of perceived impact of strategy use on their well-being; $F(2, 234) = 3.694$, $p = .028$, $\eta_p^2 = .031$. Thus, the first hypothesis (H1) expecting higher overall acceptability (satisfaction, strategy use, and impact on well-being) within the directed group was not supported, with both groups reporting comparably high levels of acceptability for the online resource.

Given the importance of strategy and resource use for the accurate assessment of acceptability and effectiveness; the same analyses were repeated among the subsample of participants who reported using the strategies presented in the web-based resource at least sometimes across all three timepoints (baseline to follow-up). Results revealed no statistically significant group by time interaction for overall satisfaction; $F(1.696, 144.162) = .266$, $p = .730$, $\eta_p^2 = .003$, strategy use; $F(1.610, 135.257) = .479$, $p = .579$, $\eta_p^2 = .006$, planned strategy use; $F(2, 168) = 1.810$, $p = .167$, $\eta_p^2 = .021$, and perceived impact on well-being; $F(2, 170) = .665$, $p = .508$, $\eta_p^2 = .008$ (Table 4). Examination of main effects revealed no significant changes in

strategy use over time for both groups using the Bonferroni correction; $F(1.793, 135.257) = .479$, $p = .044$, $\eta_p^2 = .039$. Impact on well-being also did not change over time for both the directed and non-directed groups; $F(2, 170) = 5.299$, $p = .007$, $\eta_p^2 = .059$. Overall, contrary to the first hypothesis (H1) the directed and non-directed groups did not differ in terms of overall resource acceptability, strategy use, plan for strategy use, and reported impact of strategy use on well-being.

Objective 2: Effectiveness of the Self-Directed Online Resource as Assessed by Group Differences (Directed vs Non-Directed vs Comparison) Over Time (Baseline, Post, Follow-Up) on Stress, Coping, and Well-Being Outcomes.

Series of two-way mixed design ANOVAs were conducted to assess group (directed, non-directed, comparison) by time (baseline; T1, post; T2, follow-up; T3) interactions for stress, coping (coping self-efficacy, healthy coping, unhealthy coping behaviours), and well-being outcomes. As depicted in Table 5 and Figure 1, results revealed significant group by time interactions for stress and unhealthy coping, however no significant interactions were found for coping self-efficacy, healthy coping, or well-being. Partially supporting hypothesis H2a, the directed group demonstrated significant improvements across stress and unhealthy coping in contrast to the comparison group, however there no differences between the directed and non-directed groups. Hypothesis H2b pertaining to changes in stress, coping, and well-being in the directed group relative to the comparison group was also partially supported.

Examination of simple main effects of group using the Bonferroni correction revealed no differences between groups for either stress or unhealthy coping across any of the timepoints. Patterns for the simple main effect of time indicate that stress ($p = .014$, $\eta_p^2 = .078$) and unhealthy coping ($p = .01$, $\eta_p^2 = .10$) decreased over time within both the directed and non-

directed groups but stayed stable across timepoints within the comparison group (see Figure 1). Specifically, the observed decrease in stress took place between T1 and T3 ($p = .008$) for the directed group, and between T1 and T2 ($p = .003$) for the non-directed group. Unhealthy coping decreased between T1 and T3 in both groups (directed: $p = .007$, non-directed: $p = .001$), and the decrease between T2 and T3 ($p = .001$) was significant for the non-directed group.

Analyses of main effects for the non-significant interactions revealed a significant main effect of time for coping self-efficacy ($p < .001$, $\eta_p^2 = .049$) and healthy coping ($p < .001$, $\eta_p^2 = .084$) with pairwise comparisons using the Bonferroni correction revealing a significant increase in coping self-efficacy from T1 to T3 ($p < .001$). Similarly, healthy coping showed a significant increase from T1 to T2 ($p = .001$) and from T1 to T3 ($p < .001$) across all groups.

Objective 3: Merged Groups: Effectiveness of the Self-Directed Online Resource as Assessed by Group Differences (Resource Group vs Comparison) Over Time (Baseline, Post, Follow-Up) on Stress, Coping, and Well-Being Outcomes.

Series of two-way mixed design ANOVAs were conducted to assess group (resource group; merged directed and non-directed vs comparison) by time (baseline; T1, post; T2, follow-up; T3) interactions for stress, coping (coping self-efficacy, healthy coping, unhealthy coping behaviours), and well-being outcomes. As depicted in Table 6, significant group by time interactions were found for stress and coping outcomes, although no interaction was detected for well-being. As expected, results revealed significant decreases in stress and unhealthy coping, as well as increases in coping self-efficacy and healthy coping among the resource group over time in contrast to the comparison group. Thus, hypothesis H3 was partially supported given no changes in well-being were detected.

Analyses of simple main effects of time and group for the outcomes of stress, coping self-efficacy, healthy, and unhealthy coping are presented in Figure 2. In terms of the simple main effects of time, the resource group showed significant decreases in stress ($p = .001$, $\eta_p^2 = .073$) and unhealthy coping ($p < .001$, $\eta_p^2 = .110$), and significant increases in coping self-efficacy ($p < .001$, $\eta_p^2 = .087$) and healthy coping ($p < .001$, $\eta_p^2 = .133$) over time in contrast to the comparison group. The observed changes over time took place between T1 and T3 for all outcomes (see Figure 2), with significant changes detected between T1 and T2 for stress (decrease; $p = .001$) and healthy coping (increase; $p = .002$). Furthermore, coping self-efficacy significantly increased ($p = .014$) and unhealthy coping decreased ($p = .002$) between T2 and T3 within the resource group. In terms of the simple main effect of group, the resource group reported significantly lower unhealthy coping ($p = .008$, $\eta_p^2 = .04$) at the follow-up timepoint in contrast to the comparison group, no other group differences were detected between the resource and comparison groups

Discussion

The present study sought to examine the acceptability and effectiveness of sharing a collection of evidence-based stress-management and healthy coping strategies and multimedia resources on a website for university students' self-directed use. Overall, students rated the resources and strategies presented on the website very highly, with comparably high rates of satisfaction reported by both those who received personalized recommendations after screening (i.e., directed) and those who did not receive personalized recommendations (i.e., non-directed). This finding is consistent with previous studies reporting high levels of receptivity and interest for online, self-directed support options among university populations (e.g., Ahuvia et al., 2022; Lattie, Lipson et al., 2019; Neal et al., 2011). However, it was interesting that there was no added

benefit of the screening and sharing personalized recommendations approach within the present study. It is possible that high satisfaction with the overall web-based resource and the breadth of information shared constituted a ceiling effect that prevented detection of any unique benefits of screening in the present study. This is consistent with previous findings where university students reported high levels of satisfaction with a self-directed, video outreach program (e.g., Bastien et al., 2022). These results potentially allude to students' high receptivity to information about stress-management and healthy coping that is presented in multimedia, self-paced, and visually engaging formats. Furthermore, it is possible that use of emerging adulthood as a developmental framework and the inclusion of students as part of the project team across all stages of resource development and evaluation contributed to the creation of materials that were particularly relevant for students with were ultimately very well received.

A small proportion of students (14.50%, *n* =35) reported never using the online resource and strategies over the duration of the study. While issues with resource uptake and use were expected given earlier research findings (e.g., Chung et al., 2022; Lillevoll et al., 2014; Rith-Najarian et al., 2019), it was encouraging that the majority of participants (83.49%, *n* =177) reported at least some use of the self-directed website in the present study. Exclusion of the subgroup of participants reporting no uptake did not impact the findings of acceptability, revealing comparably high levels of satisfaction across both study groups over time.

In terms of effectiveness, stress and engagement in unhealthy coping behaviours both decreased in the directed and non-directed groups with no changes observed in the comparison group. Overall, these findings suggest that using the online resource led to improvements in stress and unhealthy coping however there was no added benefit of the screening and referral approach. It is possible that screening had no impact in the present study because (1) the

researcher-developed measure may not have been sensitive enough to identify groups of need that were meaningfully distinct, or (2) students' need for support was limited in variability in the study sample. If the sample included a greater proportion of students demonstrating high need for stress-management and healthy coping support, they may have benefited to a greater extent from receiving personalized resources.

Finally, the two resource groups (directed and non-directed) were merged to examine the effectiveness of the overall online resource against the comparison group for the same outcomes (i.e., stress, coping self-efficacy, coping behaviours, and well-being). Findings revealed significant improvements across stress and coping although there was no effect on well-being. As hypothesized, stress and unhealthy coping decreased whereas coping self-efficacy and healthy coping increased from baseline to follow-up among the resource group with no changes detected in the comparison group. Additionally, the pattern of change was similar across the outcomes where changes were detected for stress and healthy coping between baseline to post timepoints, and changes for coping self-efficacy and unhealthy coping detected between post to follow-up timepoints. Contrary to what was expected, there were no changes in well-being across any of the groups over time. This finding contradicts that of Chung et al. (2022) who reported significant improvements in well-being (using the same measure) following students' use of an online self-directed mindfulness program for university students. However, the timeline between baseline and follow-up assessments was shorter in the present study (10 weeks) in comparison to the 14-weeks between baseline and follow-up in the study by Chung et al. (2022). It is therefore possible that additional time is needed to detect changes in subjective well-being in response to engagement with self-directed programming.

Taken together, the findings support the effectiveness of sharing stress-management and healthy coping resources on a self-directed digital platform for improving university students' stress and coping outcomes while demonstrating that the web-based resource was well-received. This study builds on the emerging evidence-base highlighting the promise of enhancing university student stress-management and coping-capacity through universal, online, self-directed supports (e.g., Bastien et al., 2022; Chung et al., 2022). Furthermore, findings demonstrate the potential value of extending low-intensity support options (i.e., lowest steps within SteppedCare2.0; Cornish, 2020) beyond the context of clinical service delivery to benefit students (Ryan et al., 2011). Given problems with help-seeking on campus (e.g., Bourdon et al., 2018; Dunley & Papadopoulos, 2019), the integration of low-intensity, self-directed stress-management and coping support across the whole university can function to proactively connect students with evidence-based resources.

Contributions

The unique contribution of this study towards research and practice in supporting university students' stress-management and healthy coping are threefold. First, this study contributes to the small but growing evidence base demonstrating the feasibility, acceptability, and effectiveness of low-resource, self-directed programming for supporting students' stress and coping outcomes in demanding university environments (e.g., Bastien et al., 2022; Chung et al., 2022). Second, this study responds to calls for enhancing access to freely available and trustworthy digital resources for managing stress and coping capacity as a supplement to existing mental health services on campus (e.g., Ahuvia et al., 2022; Becker & Torous, 2019; Montagni et al., 2020). Similarly, this study responds to calls to specifically promote the availability of evidence-based strategies for healthy coping in university environments to support coping

capacity and mitigate the negative impacts of engaging of unhealthy coping behaviours (e.g., Reis et al., 2021; Stallman, 2020; Stallman et al., 2022). Third, this study presented the first adaptation of the clinical screening and referral to stepped care approach for use across the general university student population to connect them with lower-intensity resources proportional with their reported level of need for stress-management and healthy coping information. While there was no evidence for a differential benefit of this adapted approach in the present study, the results suggest that the screening and directing approach may vary in its effectiveness if used with those with low needs and may only be beneficial when targeting those with more severe need for support around stress and coping.

Limitations & Future Directions

Study findings must be interpreted with consideration of the following limitations. First, the observed effects in the study are characterized by small to medium effect sizes which should be interpreted with caution. Replication studies with larger samples are needed to explore whether the same effects will hold beyond this single-institution study. Second, the timeline of the evaluation study was constrained to a relatively brief 10-week period. Although this timeframe allowed for a focused examination of the specific variables under consideration, it also limits the ability to capture longer-term effects or variations that could emerge over an extended period. Future studies with extended timelines are warranted to explore the sustainability and long-term impacts of web-based, self-directed resource to support university student stress-management and coping capacity. Third, one of the measures used (i.e., the Coping Index; CI, Stallman, 2017), exhibited poor internal consistency within the health and unhealthy coping subscales. While it was included in the present study given the measure's direct alignment with the theoretical foundations of the study (i.e., health theory of coping;

Stallman, 2020), caution is advised for future uses of this measure in research in the absence of psychometric validation. Fourth, students identifying as women were overrepresented in the study sample which impacts the generalizability of findings. While this is commonly observed across social science research (Becker, 2022), it is crucial for future studies to explore means of engaging participants who represent a more diverse range of gender identities. Fifth, the lack of impact of the screening and directing approach tested within the present study could be due to the use of a researcher-developed screening questionnaire and algorithm to facilitate the directing. It is possible that the screening questionnaire was not effective in delineating low, moderate, or high need groups. Future research could consider establishing the validity and sensitivity of the screener measure ahead of examining the effectiveness of the screening and directing approach in the context of an intervention. Finally, a notable limitation in the present study is the absence of consideration of intraindividual identity factors (e.g., gender, racial/ethnic identity) or lived experience (e.g., history of mental illness and/or trauma). Although the present study demonstrates the acceptability and effectiveness of a web-based, self-directed resource for supporting university students' stress-management and coping capacity, what remains to be explored is the potentially differential acceptability and effectiveness of the self-directed support option as a function of intraindividual identity factors.

Conclusion

In summary, the present study highlights the acceptability and effectiveness of a self-directed, web-based resource providing evidence-based stress-management and healthy coping strategies for university students. Results indicate that students tended to like the overall resource and were satisfied with the content and format of the information presented, although there was no added benefit of the screening and directing approach in the present study. Importantly,

students' engagement with the resource and use of the strategies led to improvements in stress, their belief in their capacity to cope, and their engagement in healthier coping behaviours. Thus, the web-based resource evaluated in the present study demonstrates promise for supplementing existing mental health services on campus to provide additional support for managing stress and enhancing coping capacity among university students.

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Study 3: Tables and Figures

Table 1

Participant Demographic Information and Screener Scores: Full Sample (N = 212) and the Subsample of Participants (n = 177) Who Reported at Least Some Use of the Online Resource

	Full Sample			Subsample		
	Directed	**Non-Directed**	**Comparison**	**Directed**	**Non-Directed**	**Comparison**
	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**	***M* (SD)**
Age	21.22 (2.68)	21.17 (3.13)	20.81 (2.19)	20.70 (1.79)	21.04 (3.21)	20.81 (2.19)
Gender	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Woman	60 (83.3)	54 (81.8)	59 (79.7)	44 (81.5)	41 (83.7)	59 (79.7)
Man	11 (15.3)	9 (13.6)	14 (18.9)	10 (18.5)	7 (14.3)	14 (18.9)
Non-binary	0 (0)	3 (4.5)	1 (1.4)	0 (0)	1 (2)	1 (1.4)
Prefer not to say	1 (1.4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Faculty of Study	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Agriculture & Environmental Science	5 (6.9)	6 (9.1)	5 (6.8)	5 (9.3)	3 (6.1)	5 (6.8)
Arts	18 (25)	17 (25.8)	21 (28.4)	12 (22.2)	13 (26.5)	21 (28.4)
Continuing Studies	1 (1.4)	0 (0)	0 (0)	1 (1.9)	0 (0)	0 (0)
Education	1 (1.4)	1 (1.5)	4 (5.4)	1 (1.9)	1 (2)	4 (5.4)
Engineering	1 (1.4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Law	5 (6.9)	4 (6.1)	2 (2.7)	3 (5.6)	2 (4.1)	2 (2.7)
Management	19 (26.4)	24 (36.4)	24 (32.4)	18 (33.3)	20 (40.8)	24 (32.4)
Medicine	1 (1.4)	2 (3)	3 (4.1)	1 (1.9)	2 (4.1)	3 (4.1)
Music	1 (1.4)	0 (0)	0 (0)	1 (1.9)	0 (0)	0 (0)
Nursing	3 (4.2)	1 (1.5)	0 (0)	2 (3.7)	1 (2)	0 (0)
Science	13 (18.1)	6 (9.1)	11 (14.9)	8 (14.8)	4 (8.2)	11 (14.9)
Other	4 (5.6)	5 (7.6)	4 (5.4)	2 (3.7)	3 (6.1)	4 (5.4)
Screener score	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Low need	44 (61.1)	42 (63.6)	50 (67.6)	34 (63)	29 (59.2)	50 (67.6)
Moderate need	28 (38.9)	24 (36.4)	24 (32.4)	20 (37)	20 (40.8)	24 (32.4)
High need	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Note: The category of *other* for Faculty of Study included those in cross-faculty programs (e.g., Arts & Science). The scoring algorithm for the screener to determine low, moderate, and high need categories is provided in Appendix D.

Table 2

Participant Ratings of Satisfaction with the Web-Based Resource among the Directed (n = 72) and Non-Directed (n = 66) Groups

	2-week check-in		Time 2 (post)		Time 3 (follow-up)	
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
	Disagree	**Agree**	**Disagree**	**Agree**	**Disagree**	**Agree**
1. Useful						
Directed	17 (25.6)	49 (74.2)	18 (25.7)	52 (74.3)	17 (23.9)	54 (76.1)
Non-Directed	10 (16.9)	49 (83.1)	14 (23.0)	47 (77.0)	14 (21.9)	50 (78.1)
2. Engaging						
Directed	14 (21.2)	52 (78.8)	18 (25.7)	52 (74.3)	12 (16.9)	59 (83.1)
Non-Directed	10 (16.9)	49 (83.1)	11 (18.0)	50 (82.0)	9 (14.1)	55 (85.9)
3. Valuable						
Directed	6 (9.2)	59 (90.8)	5 (7.1)	65 (92.9)	7 (9.9)	64 (90.1)
Non-Directed	5 (8.5)	54 (91.5)	2 (3.3)	59 (96.7)	5 (7.8)	59 (92.2)
4. Recommend to others						
Directed	14 (21.2)	52 (78.8)	12 (17.1)	58 (82.9)	11 (15.5)	60 (84.5)
Non-Directed	11 (18.6)	48 (81.4)	10 (16.4)	51 (83.6)	8 (12.5)	56 (87.5)
5. Helpful						
Directed	19 (28.8)	47 (71.2)	16 (22.9)	54 (77.1)	12 (16.9)	59 (83.1)
Non-Directed	11 (18.6)	48 (81.4)	10 (16.4)	51 (83.6)	13 (20.6)	50 (79.4)
6. Easy to understand						
Directed	5 (7.6)	61 (92.4)	7 (10.1)	62 (89.9)	5 (7.0)	66 (93.0)
Non-Directed	4 (6.8)	55 (93.2)	7 (11.5)	54 (88.5)	4 (6.3)	60 (93.8)
7. Confident in understanding						
Directed	8 (12.1)	58 (87.9)	4 (5.8)	65 (94.2)	6 (8.5)	65 (91.5)
Non-Directed	11 (18.6)	48 (81.4)	7 (11.5)	54 (88.5)	11 (17.2)	53 (82.8)
8. Motivated to try strategies						
Directed	25 (37.9)	41 (62.1)	24 (34.3)	46 (65.7)	17 (24.3)	53 (75.7)
Non-Directed	16 (27.6)	42 (72.4)	19 (31.7)	41 (68.3)	21 (32.8)	43 (67.2)

Note. Complete list of questions on the acceptability questionnaire are provided in the Supplemental Material 1. Response options of strongly agree and agree were combined for simplicity of reporting. Note that the first assessment of acceptability was conducted at 2-week check-in where participants completed the acceptability measure 2-weeks after receiving access to the web-based resource.

Table 3

Participant Ratings of Actual and Planned Use of Strategies and the Impact of Strategy Use on Well-Being among the Directed (n = 72) and Non-Directed (n = 66) Groups.

	2-week check-in				Time 2 (post)				Time 3 (follow-up)			
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
	Never	**Sometimes**	**Frequently**	**Everyday**	**Never**	**Sometimes**	**Frequently**	**Everyday**	**Never**	**Sometimes**	**Frequently**	**Everyday**
9. Strategy use												
Directed	11 (16.7)	49 (74.2)	6 (9.1)	0 (0)	11 (15.7)	50 (71.4)	9 (12.9)	0 (0)	11 (15.5)	45 (63.4)	13 (18.3)	2 (2.8)
Non-Directed	8 (13.6)	45 (76.3)	6 (10.2)	0 (0)	10 (16.7)	43 (71.7)	7 (11.7)	0 (0)	7 (10.9)	47 (73.4)	10 (15.6)	0 (0)
10. Planned strategy use												
Directed	4 (6.1)	41 (62.1)	20 (30.3)	1 (1.5)	2 (2.9)	41 (59.4)	20 (29.0)	6 (8.7)	7 (9.9)	41 (57.7)	20 (28.2)	3 (4.2)
Non-Directed	2 (3.4)	34 (57.6)	20 (33.9)	3 (5.1)	2 (3.0)	36 (59.0)	22 (36.1)	1 (1.6)	4 (6.3)	40 (62.5)	18 (28.1)	2 (3.1)
	None	**Low**	**Somewhat**	**High**	**None**	**Low**	**Somewhat**	**High**	**None**	**Low**	**Somewhat**	**High**
11. Impact on well-being												
Directed	10 (15.2)	19 (28.8)	33 (50.0)	4 (6.1)	8 (11.4)	18 (25.7)	40 (57.1)	4 (5.7)	9 (12.7)	10 (14.1)	46 (64.8)	6 (8.5)
Non-Directed	8 (13.6)	21 (35.6)	29 (49.2)	1 (1.7)	9 (14.8)	16 (26.2)	34 (55.7)	2 (3.3)	7 (10.9)	18 (28.1)	37 (57.8)	2 (3.1)

Note. Complete list of questions on the acceptability questionnaire are provided in the Supplemental Material 1. Response options of strongly agree and agree were combined for simplicity of reporting. Note that the first assessment of acceptability was conducted at 2-week check-in where participants completed the acceptability measure 2-weeks after receiving access to the web-based resource.

Table 4

Series of 2 (Group: Directed, Non-directed) x 3 (Time: Pre, Post, Follow-up) Mixed Design ANOVAs for Acceptability of Web-Based Resource.

Outcome	Time point	Full sample			
		Directed (n = 54)		Non-directed (n = 49)	
Satisfaction Sum		***M***	***SD***	***M***	***SD***
Int: $F(1.764, 206.390) = .015$, $p = .977$, $\eta_p^2 = .000$	Pre	23.60	4.57	23.91	3.02
MET: $F(1.764, 206.390) = 1.332$, $p = .266$, $\eta_p^2 = .011$	Post	23.52	3.85	23.77	3.13
MEG: $F(1, 117) = .176$, $p = .676$, $\eta_p^2 = .002$	Follow-up	24.03	4.00	24.23	3.87
Strategy Use					
Int: $F(1.793, 208.039) = .204$, $p = .792$, $\eta_p^2 = .002$	Pre	3.10	0.50	3.04	0.51
MET: $F(1.793, 208.039) = 3.576$, $p = .034$, $\eta_p^2 = .030$	Post	3.05	0.52	3.05	0.52
MEG: $F(1, 116) = .097$, $p = .756$, $\eta_p^2 = .001$	Follow-up	2.95	0.68	2.93	0.54
Planned Strategy Use					
Int: $F(2, 232) = 1.554$, $p = .214$, $\eta_p^2 = .013$	Pre	2.76	0.56	2.61	0.65
MET: $F(2, 232) = 1.696$, $p = .186$, $\eta_p^2 = .014$	Post	2.61	0.66	2.66	0.58
MEG: $F(1, 116) = .479$, $p = .490$, $\eta_p^2 = .004$	Follow-up	2.79	0.68	2.70	0.63
Impact on Well-Being					
Int: $F(2, 234) = .067$, $p = .928$, $\eta_p^2 = .001$	Pre	2.44	0.82	2.39	0.76
MET: $F(2, 234) = 3.694$, $p = .028$, $\eta_p^2 = .031$	Post	2.54	0.78	2.48	0.81
MEG: $F(1, 117) = .317$, $p = .575$, $\eta_p^2 = .003$	Follow-up	2.65	0.83	2.55	0.74
		Subsample			
		Directed (n = 46)		**Non-directed** (n = 41)	
Satisfaction Sum					
Int: $F(1.696, 144.162) = .266$, $p = .730$, $\eta_p^2 = .003$	Pre	24.57	4.08	24.83	2.62
MET: $F(1.696, 144.162) = 1.894$, $p = .161$, $\eta_p^2 = .022$	Post	24.41	3.12	24.63	2.89
MEG: $F(1, 85) = .032$, $p = .859$, $\eta_p^2 = .000$	Follow-up	25.26	3.14	25.07	2.92
Strategy Use					
Int: $F(1.610, 135.257) = .479$, $p = .579$, $\eta_p^2 = .006$	Pre	2.89	0.31	2.85	0.36
MET: $F(1.610, 135.257) = 3.447$, $p = .044$, $\eta_p^2 = .039$	Post	2.85	0.36	2.85	0.36
MEG: $F(1, 84) = .009$, $p = .924$, $\eta_p^2 = .000$	Follow-up	2.72	0.54	2.78	0.42
Planned Strategy Use					
Int: $F(2, 168) = 1.810$, $p = .167$, $\eta_p^2 = .021$	Pre	2.62	0.49	2.44	0.63
MET: $F(2, 168) = 1.343$, $p = .264$, $\eta_p^2 = .016$	Post	2.49	0.66	2.54	0.55
MEG: $F(1, 84) = .108$, $p = .743$, $\eta_p^2 = .001$	Follow-up	2.60	0.62	2.63	0.62
Impact on Well-Being					

Int: $F(2, 170) = .665$, $p = .508$, $\eta_p^2 = .008$	Pre	2.70	0.66	2.66	0.57
***MET**: $F(2, 170) = 5.299$, $p = .007$, $\eta_p^2 = .059$	Post	2.83	0.57	2.78	0.57
MEG: $F(1, 85) = .811$, $p = .370$, $\eta_p^2 = .009$	Follow-up	2.98	0.49	2.80	0.51

Note. **Int** = Interaction, **MET** = Main effect of Time, **MEG** = Main effect of Group, $*p < .05$, Bonferroni correction ($p = .05/2 = .025$) was used at the level of main effects to account for multiple comparisons.

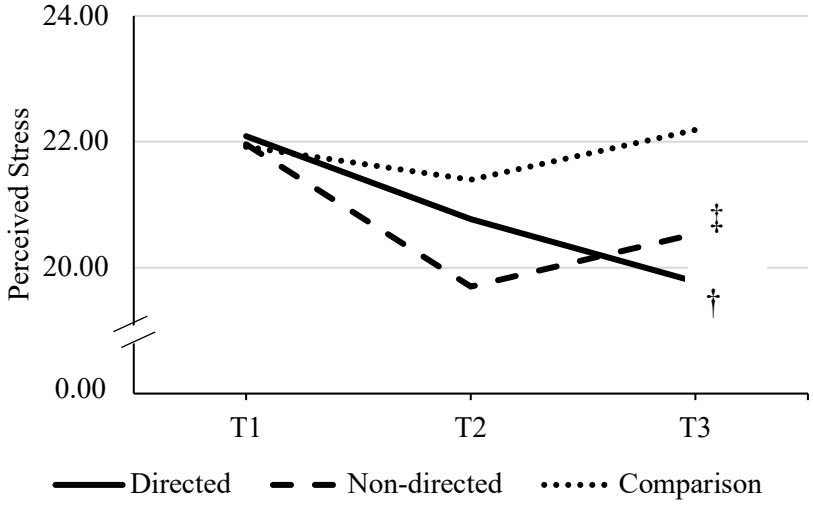
Table 5

Series of 3 (Group: Active, Passive, Comparison) x 3 (Time: Baseline, Post, Follow-up) Mixed Design ANOVAs for Mental Health & Well-Being Outcomes among a Subsample of Participants Who Reported Using the Strategies Presented in the Online Resource (N = 177)

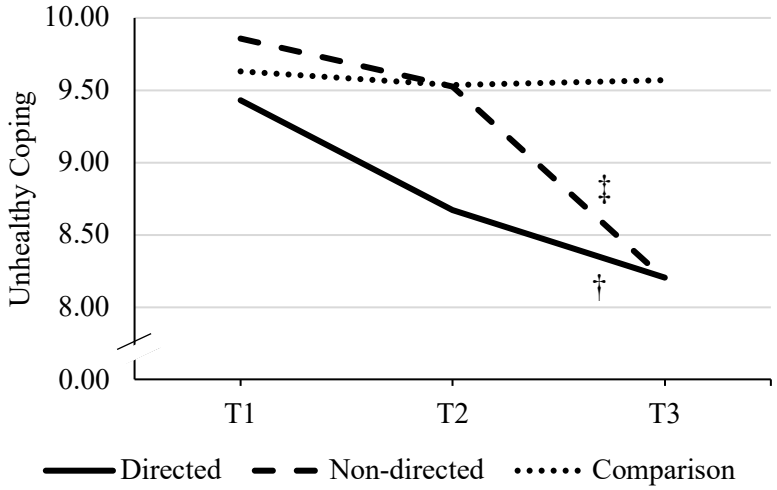
Outcome	Time point	Directed (n = 54)		Non-directed (n = 49)		Comparison (n = 74)	
		M	***SD***	***M***	***SD***	***M***	***SD***
Stress							
***Int**: $F(3.807, 331.190) = 2.571$, $p = .041$, $\eta_p^2 = .029$	Baseline	22.09	5.68	21.96	6.24	21.92	6.20
***MET**: $F(1.903, 331.190) = 6.613$, $p = .002$, $\eta_p^2 = .037$	Post	20.77	6.36	19.70	5.77	21.40	6.73
MEG: $F(2, 174) = .770$, $p = .464$, $\eta_p^2 = .009$	Follow-up	19.78	5.46	20.53	6.35	22.19	6.92
Coping Self-Efficacy							
Int: $F(4, 348) = 2.395$, $p = .052$, $\eta_p^2 = .027$	Baseline	143.10	36.91	136.66	37.58	143.78	42.04
****MET**: $F(2, 348) = 8.993$, $p < .001$, $\eta_p^2 = .049$	Post	147.54	42.91	146.70	37.24	145.25	45.41
MEG: $F(2, 174) = .325$, $p = .704$, $\eta_p^2 = .004$	Follow-up	158.55	38.30	151.35	39.45	144.81	43.78
Healthy Coping							
Int: $F(4, 348) = 1.978$, $p = .098$, $\eta_p^2 = .022$	Baseline	12.00	3.94	11.71	3.11	12.02	3.56
****MET**: $F(2, 348) = 15.962$, $p < .001$, $\eta_p^2 = .084$	Post	13.12	3.56	12.66	3.31	12.34	3.54
MEG: $F(2, 174) = .688$, $p = .504$, $\eta_p^2 = .008$	Follow-up	13.69	3.90	13.46	3.17	12.46	4.07
Unhealthy Coping							
***Int**: $F(3.697, 321.674) = 2.937$, $p = .024$, $\eta_p^2 = .033$	Baseline	9.43	9.43	9.86	3.15	9.63	3.93
****MET**: $F(1.849, 321.674) = 9.603$, $p < .001$, $\eta_p^2 = .052$	Post	8.67	8.67	9.52	3.01	9.54	3.57
MEG: $F(2, 174) = 1.235$, $p = .293$, $\eta_p^2 = .014$	Follow-up	8.20	8.20	8.19	2.98	9.57	3.60
Well-being							
Int: $F(4, 348) = .611$, $p = .651$, $\eta_p^2 = .007$	Baseline	3.09	0.65	3.16	0.59	3.24	0.64
MET: $F(2, 348) = .762$, $p = .465$, $\eta_p^2 = .004$	Post	3.17	0.66	3.23	0.59	3.24	0.77
MEG: $F(1, 174) = .169$, $p = .845$, $\eta_p^2 = .002$	Follow-up	3.18	0.66	3.19	0.67	3.19	0.72

Note. **Int** = Interaction, **MET** = Main effect of Time, **MEG** = Main effect of Group, *p <.05, **p<.001.

Figure 1.
Scores on Perceived Stress and Unhealthy Coping by Time and Group (Directed, Non-Directed, Comparison); Depicting Simple Main Effects and Pairwise Comparisons for Each Outcome.



Note. † Denotes simple main effect of time in the directed group, $F(2, 106) = 4.512$, $p = .014$, $\eta_p^2 = .078$, T1-T3 ($p = .008$).
‡ Denotes simple main effect of time in the non-directed group, $F(1.709, 82.012) = 5.321$, $p = .01$, $\eta_p^2 = .10$, T1-T2 ($p = .003$).
No group differences at T1: $F(2, 174) = .013$, $p = .987$, T2: $F(2, 174) = 1.050$, $p = .352$, and T3: $F(2, 174) = 2.433$, $p = .091$.



Note. † Denotes simple main effect of time in the directed group, $F(2, 106) = 4.813$, $p = .011$, $\eta_p^2 = .083$, T1-T3 ($p = .007$).
‡ Denotes simple main effect of time in the non-directed group, $F(2, 96) = 8.877$, $p < .001$, $\eta_p^2 = .156$, T1-T3 ($p = .001$), T2-T3 ($p = .001$).
No group differences at T1: $F(2, 174) = .193$, $p = .825$, T2: $F(2, 174) = 1.334$, $p = .266$ and T3: $F(2, 174) = 3.612$, $p = .029$ (using Bonferroni correction $.05/2 = .025$).

Table 6

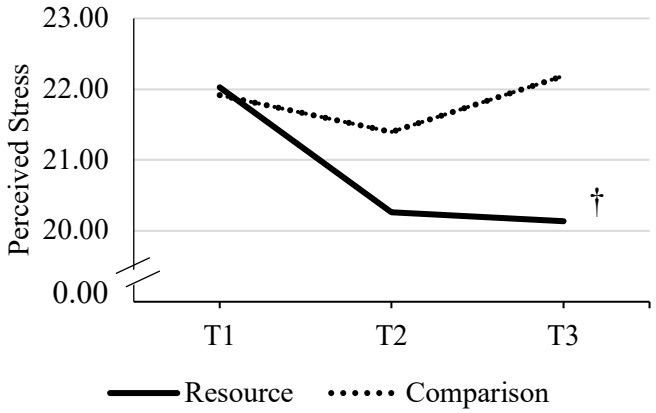
Series of 2 (Group: Resource, Comparison) x 3 (Time: Baseline, Post, Follow-up) Mixed Design ANOVAs for Mental Health & Well-Being Outcomes after Merging the Directed and Non-directed Groups into a Single Resource Group (N = 177)

Outcome	Time point	Resource Group		Comparison	
		M	***SD***	***M***	***SD***
Stress					
***Int**: $F(1.911, 334.382) = 3.597$, $p = .030$, $\eta_p^2 = .020$	Baseline	22.03	5.92	21.92	6.20
***MET**: $F(1.911, 334.382) = 4.230$, $p = .017$, $\eta_p^2 = .024$	Post	20.26	6.08	21.40	6.73
MEG: $F(1, 175) = 1.530$, $p = .218$, $\eta_p^2 = .009$	Follow-up	20.14	5.89	22.19	6.92
Coping Self-Efficacy					
***Int**: $F(2, 350) = 4.196$, $p = .017$, $\eta_p^2 = .023$	Baseline	140.04	37.19	143.78	42.04
***MET**: $F(1.943, 339.997) = 5.448$, $p = .005$, $\eta_p^2 = .030$	Post	147.14	40.12	145.25	45.41
MEG: $F(1, 175) = .257$, $p = .613$, $\eta_p^2 = .001$	Follow-up	155.12	38.83	144.81	43.78
Healthy Coping					
***Int**: $F(2, 350) = 3.894$, $p = .022$, $\eta_p^2 = .022$	Baseline	11.86	3.55	12.02	3.56
****MET**: $F(2, 350) = 11.259$, $p < .001$, $\eta_p^2 = .060$	Post	12.90	3.43	12.34	3.54
MEG: $F(1, 175) = 1.109$, $p = .294$, $\eta_p^2 = .006$	Follow-up	13.58	3.56	12.46	4.07
Unhealthy Coping					
***Int**: $F(1.854, 324.520) = 4.784$, $p = .011$, $\eta_p^2 = .027$	Baseline	9.63	3.11	9.63	3.93
***MET**: $F(1.854, 324.520) = 5.532$, $p = .005$, $\eta_p^2 = .031$	Post	9.08	2.96	9.54	3.57
MEG: $F(1, 175) = 1.921$, $p = .168$, $\eta_p^2 = .011$	Follow-up	8.20	3.13	9.57	3.60
Well-being					
Int: $F(2, 350) = .989$, $p = .372$, $\eta_p^2 = .006$	Baseline	3.13	0.62	3.24	0.64
MET: $F(2, 350) = .513$, $p = .595$, $\eta_p^2 = .003$	Post	3.20	0.63	3.24	0.77
MEG: $F(1, 175) = .367$, $p = .546$, $\eta_p^2 = .002$	Follow-up	3.18	0.66	3.19	0.72

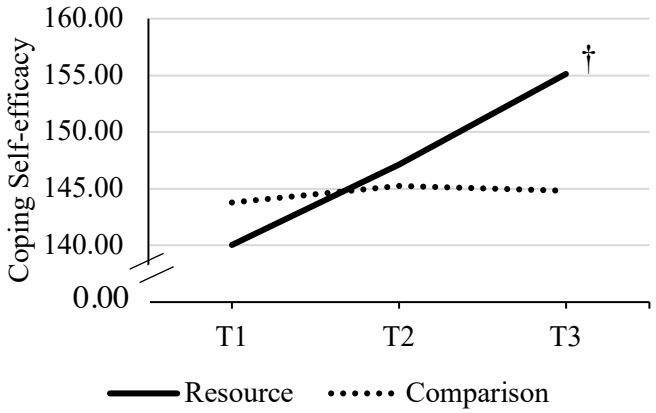
Note. **Int** = Interaction, **MET** = Main effect of Time, **MEG** = Main effect of Group, *$p < .05$, **$p < .001$

Figure 2.

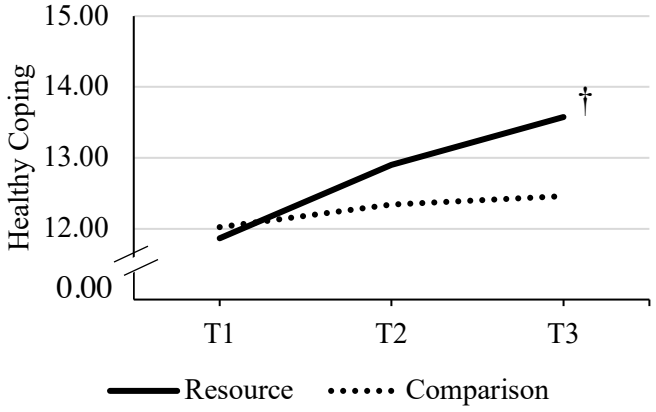
Scores on Stress and Coping Outcomes by Time and Group (Resource, Comparison); Depicting Simple Main Effects of Time and Group as well as Pairwise Comparisons for Each Outcome.



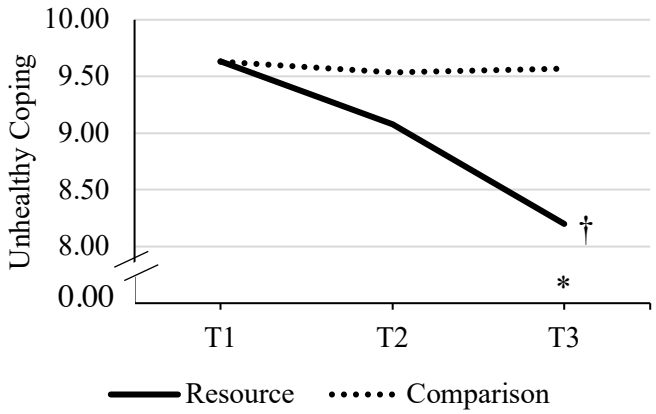
Note. † Denotes simple main effect of time in the resource group, $F(1.882, 15128) = .8.084$, $p = .001$, $\eta_p^2 = .073$, T1-T2 (p=.001), T1-T3 (p=.002).
No simple main effect of group was detected at T1: $F(1, 175) = .014$, p=.906, T2: $F(1, 175) = 1.371$, p=.243, and T3: $F(1, 175) = 4.517$, p=.035, $\eta_p^2 = .025$.



Note. † Denotes simple main effect of time in the resource group, $F(2, 204) = 9.683$, p <.001, $\eta_p^2 = .087$, T1-T3 (p<.001), T2-T3 (p=.014).
No simple main effect of group was detected at T1: $F(1, 175) = .391$, p=.532, T2: $F(1, 175) = .086$, p=.770, and T3: $F(1, 175) = 2.728$, p=.100.



Note. † Denotes simple main effect of time in the resource group, $F(2, 204) = 15.585$, p <.001, $\eta_p^2 = .133$, T1-T2 (p=.002), T1-T3 (p<.001).
No simple main effect of group was detected at T1: $F(1, 175) = .085$, p=.771, T2: $F(1, 175) = 1.133$, p=.289, and T3: $F(1, 175) = 3.755$, p=.054.



Note. † Denotes simple main effect of time in the resource group, $F(1.886, 192.406) = 12.552$, p <.001, $\eta_p^2 = .110$, T1-T3 (p<.001), T2-T3 (p=.002).
* Denotes simple main effect of group at T3: $F(1, 175) = 7.266$, p=.008, $\eta_p^2 = .04$.
No simple main effect of group was detected at T1: $F(1, 175) = .000$, p=.995, or T2: $F(1, 175) = .866$, p=.353, and T2: $F(2, 175) = 3.755$, p=.054.

Chapter 5: General Discussion

Summary of Findings & Original Contributions to Knowledge

The series of studies within this dissertation suggest that stress has an enduring impact on students' adjustment to university even when stress is assessed using a very brief, 4-item measure. In addition, the studies suggest that students' stress, coping behaviours, and beliefs about their ability to cope can be influenced through programming that is embedded in curriculum or presented online for independent self-directed use.

Specifically, study 1 was the first to demonstrate the significant relation between stress and adjustment to university over 18 months, building on earlier research reporting on this relation over a shorter duration (Friedlander et al., 2007; Gfellner & Córdoba, 2017; Olmstead et al., 2016; Pancer et al., 2000). Furthermore, study 1 was unique in employing a very brief, 4-item measure for stress when demonstrating this relation – suggesting that even a short checklist of screener questions for general perceived stress can be an early indicator of how students may subsequently adapt to the university environment.

Study 2 was the first to demonstrate the feasibility, acceptability, and effectiveness of embedding a stress-management and well-being program within a professional undergraduate curriculum. Extending previous setting-based approaches to a non-health related discipline (Fernandez et al., 2016), study 2 showed that instruction around stress-management and well-being can be effectively embedded as part of a teacher education curriculum. Additionally, this study is a direct response to research calls to integrate stress-management and well-being instruction as part of teacher education given documented problems with stress and well-being in the teaching profession (Arens & Morin 2016, Atkins & Rodger, 2016; Darling-Hammond, 2006). The study findings are particularly significant in demonstrating both high acceptability

and effectiveness of the setting-based approach in supplementing teacher education and supporting pre-service teachers' preparation for a demanding profession.

Lastly, study 3 demonstrated the acceptability and effectiveness of a universal, online, community-embedded, self-directed resource for benefiting university students' stress-management and coping capacity. Building on research in the clinical realm (e.g., Fleischman et al., 2018; Hasking et al., 2023), this study advanced the field in a novel way by adapting and testing the self-directed approach in a non-clinical, low-intensity stress and coping context while simultaneously examining whether there is any added benefit to directing participants to specific resources based on screening. While the directed approach did not appear to have an added benefit, results suggest the viability of a community-embedded, online resource for addressing students' stress and coping difficulties in university. Importantly, the provision of a comprehensive resource addressing a broad range of stress, coping, and well-being topics pertinent to university students was shown to be effective for improving stress and coping outcomes and was well-received by students.

Beyond the contributions to research described above, the series of studies in this dissertation contribute to our understanding and theoretical conceptualization of how to address stress and build coping capacity in demanding higher education contexts. First, this series of studies demonstrate that low-intensity, instructional approaches for student support have high potential to enhance stress-management and coping capacity. While this contribution aligns well with the Stepped-Care2.0 (SC2.0) framework reconceptualizing mental health care in higher education (Berger et al., 2021; Cornish, 2020; Cornish et al., 2017), the present studies suggest that the lowest intensity steps of stepped-care (i.e., screening to identify needs, instructional, or self-directed supports) can be delivered effectively using a universal, community-based model

without being reserved to institutions' health and wellness service or unit. Extending the lowest intensity supports beyond the clinical service delivery unit is consistent with the overarching goal of SC2.0 which is improving access to mental health supports for all (Bower & Gilbody, 2005; Cornish, 2020). However, students access to SC2.0 supports currently relies on their individual help-seeking initiative and requires that they self-present at the institutions' health and wellness centre which students' may be reluctant to do (e.g., Dunley & Papadopoulos, 2019). Thus, extending the lowest intensity supports into the university community more broadly can proactively connect students with resources for their stress and coping. Furthermore, the integration of low-intensity supports across the university setting has the potential to lower the burden of demand that clinical services are currently facing.

Additionally, this research presents an application of the health theory of coping which outlines a hierarchical model depicting how university students cope with different intensities of stress and distress along a spectrum of healthy and unhealthy behaviours (Stallman, 2020; Stallman et al., 2022). Literature on the health theory of coping highlights the need to promote engagement in healthy coping behaviours (e.g., positive self-talk, meditation, social support) because unhealthy coping behaviours (e.g., avoidance, substance use, non-suicidal self-injury) are often easily accessed and effective for addressing momentary distress despite high risk of leading to adverse outcomes in the long term (Stallman, 2020; Stallman et al., 2022). In the present dissertation, studies 2 and 3 respectively present effective instructional and online means for promoting the availability of and access to evidence-based healthy coping strategies for university students. Encouragingly, studies 2 and 3 demonstrate the positive impact of each approach for students' stress and coping outcomes, including greater confidence about their ability to cope with difficulty. Thus, the present findings support the conceptualization of

university students' coping decisions as shown in the health theory of coping while simultaneously detailing two approaches (instructional and self-directed) for effectively promoting engagement in healthy coping behaviours.

Moreover, this dissertation contributes to our understanding of university students' psychosocial development in relation to their stress-management and coping needs during their transition to adulthood, i.e., emerging adulthood (Arnett, 2000, 2023). The present series of studies demonstrate the sheer range of novel stressors and challenges for which emerging adult university students request support. Evidently, early stress at the beginning of university studies was found to be consequential for how students generally adjust to the university environment over the next year and a half (study 1) – which suggests a need to support students' emotional, social, and academic adjustment to university over the duration of their studies, well beyond orientation. Furthermore, working in collaboration with students and including them in the process of developing the instructional and self-directed supports tested in studies 2 and 3 enabled the development of supports specifically designed to meet the needs that were highlighted and for which resources were requested. Thus, discussion of the following topics: self-awareness of teacher identity and values, reframing problem behaviours in the classroom, effective communication with colleagues, advocacy in schools, among others were all integrated within the instructional program for pre-service teachers in study 2. Similarly, multimedia resources on topics such as dealing with breakups, managing household responsibilities, managing relationships and finances, career planning, and managing adult responsibilities (also referred to as *adulting*), were included in the self-directed online resource tested in study 3. It is likely that the inclusion of resources across a range of topics pertinent for emerging adult stress and coping directly contributed to the effectiveness of the instructional and self-directed

approach for enhancing university students' stress-management and coping capacity, while also being very well-received.

The present dissertation employed the Lazarus and Folkman (1984) definition for stress where stress is defined as an internal experience that occurs when we perceive that the demands of our environment exceed our capacity to meet those demands. Meaning that internal capacity to cope is weighed against the perceived demands of the environment which determines how stress is experienced individually. The findings of the present dissertation suggest that internal coping capacity can be influenced through instructional and self-directed programming to improve the intensity of the stress experience. Thus, embedding relevant, engaging, developmentally appropriate and evidence-based stress-management and coping supports within the broader university environment can be a viable and cost-effective support option for addressing high levels of stress and enhancing coping capacity among university students. Finally, the present dissertation contributes to the evidence-base that can inform the implementation of the National Standard for Post-Secondary Student Mental Health and Well-being (MHCC & CSA, 2020). Specifically, this research program demonstrates how stress-management and coping supports can be integrated as part of routine activities in the university environment, i.e., effectively presenting ways of applying the recommendations within the national standard (MHCC & CSA, 2020). Implications for practice in the area of supporting university student stress and coping are discussed in the next section.

Implications for Practice

Universities are grappling with the challenge of meeting the increasing demand for mental health and well-being services on campus which exceeds the capacity of existing, traditional models of service delivery (e.g., multi-session individual or group counselling;

Auerbarch et al., 2018). Thus, the exploration of alternative, resource-effective approaches to support students' stress, coping, and well-being has become imperative. The present dissertation sheds light on (a) the crucial role of stress in long-term adjustment outcomes, and (b) the potential of enhancing students' stress-management and coping capacity through low-intensity programming that is either embedded in curriculum or presented online for self-directed use. In particular, findings in study 1 imply that an early flag of high stress should not be dismissed given the longitudinal association with subsequent adjustment difficulties. Furthermore, study 1 suggests the feasibility of using a very brief screening measure for stress which can then be used to proactively connect students with low-intensity support programming.

Similarly, the promising results of study 2 demonstrate the feasibility of the setting-based approach for support programming in a professional degree program which warrants discussion of implications for both university students (pre-service teachers in study 2) and professional education at large. First, this study shows students' receptivity to skill-building instruction around stress and coping as aligned with their current needs in an academic environment and their anticipated needs in professional teaching contexts. Second, study 2 showed that embedding this instruction into the existing curriculum was effective for benefiting university students' stress, coping, and self-efficacy outcomes. Overall, current findings imply that curriculum-embedded, skills-based instruction is a viable approach to support student stress and coping particularly for those within professional degree programs (e.g., teacher education). The results suggest that it would be worthwhile to explore ways of adapting this instruction for other professional programs (e.g., law, nursing, engineering) to supplement students' stress-management and coping skills through curriculum in tandem with their preparation for their chosen professions.

Importantly, insights gained throughout the program implementation and evaluation process in study 2 suggest certain considerations for practice. Namely, making room in the curriculum of a professional degree program for additional instruction is highly challenging and can only be navigated through the support of administrators and departmental and faculty-level leadership. Similarly, training program facilitators and ensuring their adherence to the program during delivery requires additional planning, personnel, and resources (e.g., conducting presenter evaluations, monitoring program delivery in different course sections). For these reasons, it is worthwhile to explore ways of integrating similar stress-management and well-being programming in e-learning, digitized formats which would eliminate the need for program instructor/facilitator and allow students to complete the program independently at their own pace without taking away from existing curriculum.

Relatedly, study 3 examined the acceptability and effectiveness of a web-delivered, self-directed resource for supporting university students' stress-management and coping capacity with promising results. Although it should be noted that the development of a web-based resource of this scope (i.e., broad range of topics addressed, multimedia format) requires a large initial investment of time, personnel, and budget allocation. This initial investment may be an obstacle for certain institutions' efforts to expand their support options for students. Thus, findings of study 3 can potentially provide leverage to advocate for necessary budget allocations and initial investment to adapt and/or develop comparable web-based platforms. Another implication for practice pertains to implementation and sustainability; study 3 showed that up to 14% (n = 35) of our total sample of participants reported never using the web-based resource. Low rates of resource uptake have been documented in earlier studies and is a common challenge within student higher education research and practice (e.g., Chung et al., 2022;

Fleming et al., 2018; Rith-Najarian et al., 2019). Therefore, an important implication for practice is to monitor resource use and uptake throughout implementation to ensure ongoing and sustained use of the web-based resource.

Lastly, the present dissertation demonstrates the clear added value of meaningful collaboration with emerging adult university students in the development of programming and supports that are designed for their use. While consideration of developmental stage and/or developmental needs may not constitute a priority concern within higher education service delivery, it is evident from the present series of studies that integration of the emerging adulthood developmental framework to inform resource creation and selection of topics contributed to increased acceptability of resources and delivery formats.

In summary, the dissertation not only identifies the significance of responding to early indicators of student stress but also proposes a viable solution for addressing stress and enhancing coping capacity through curriculum-embedded and self-directed programming. Thus, the present dissertation provides an evidence-base that has the potential to inform adaptations to service-delivery models in higher education, highlighting the benefit of both a curriculum-embedded instructional program and an online, web-based resource for self-directed use. However, this series of studies present pilot evaluations of the approaches tested at a single institution and replication studies are needed for conclusive results.

Limitations & Directions for Future Research

Beyond the limitations discussed within each of the three research manuscripts comprising this dissertation, there are several overarching limitations that warrant further discussion and have the potential to inform future directions in research. The overarching limitations pertain to (1) longer term sustainability of the associations and effects described in

this dissertation, (2) generalizability of findings beyond the individual, single-institution, and (3) interpretation of the strength of associations and effects described across the three studies.

First, while all studies in the present dissertation employed longitudinal designs the length of follow-up periods were limited (i.e., 18-months in study 1; 1-month in studies 2 and 3). It is recommended that future studies employ longer follow-ups to explore whether the reported effects sustain over longer time periods. For instance, while stress upon entry to university was found to have an enduring effect on adjustment to university well into students' second year of studies, future research is needed to determine the full trajectory of stress and adjustment over the entire duration of university studies. Similarly, while majority of the effects on stress and coping outcomes in studies 2 and 3 emerged at the one-month follow-up timepoint, future studies need to examine whether this effect holds over a longer follow-up.

Second, the generalizability of the series of studies is constrained by (a) selection bias and (b) lack of consideration of individual identities (e.g., gender, racial/ethnic) and/or lived experience or history of mental illness. In terms of selection bias, samples across all studies consist of university students who self-selected to participating in the studies and it is possible that these students already had higher receptivity for or interest in stress and coping topics. This may have introduced a selection bias for our sample composition and may have influenced results. While the potential for self-selection bias was countered by offering compensation for study participation, this was done through a raffle in study 1 and through pro-rated compensation for the completion of each survey in study 3. Selection bias is less likely in study 2 as participants consisted of a captive audience who were already enrolled in the course where the stress-management and well-being program was delivered. Those who agreed to participate in the evaluation (73% consent rate) were compensated for survey completion. Similarly,

generalizability of the series of studies is limited by the overrepresentation of students identifying as women across all studies. While this is common is social science research (Becker, 2022), it is important for future research to explore ways of engaging with participants representing broader range of gender identities. Relatedly, a significant limitation within the present dissertation is the lack of consideration of individual identity factors (e.g., gender identity, racial/ethnic identity, history of mental illness and/or lived experience of trauma) across the three studies. This series of studies constitute an important first step for exploring what works best and how, for supporting university students' stress-management and coping capacity through universal, setting-based and self-directed approaches. While results suggest the effectiveness of these approaches for students' stress and coping outcomes broadly, it is unclear if the programming may be differentially effective for unique subgroups of students based on intraindividual identity factors. Therefore, exploring the potentially differential acceptability and effectiveness of low-intensity stress-management and healthy coping programming as a function of unique identities is an important future direction for research. Additionally, all studies within this dissertation were conducted at a single institution and replication across other higher education contexts is needed to generalize.

Lastly, effect sizes describing the strength of associations and effects within this dissertation ranged from low in studies 2 and 3 to medium in study 1. Although significant patterns of improvement were detected in both studies 2 and 3, there were no effects found for certain outcomes (e.g., general mental health in study 2, well-being in study 3). These limitations suggest caution in the interpretation of study findings (Andrade, 2021). Overall, this series of studies exhibit several limitations that necessitate careful consideration and warrant future research directions as discussed. Nevertheless, the present dissertation constitutes an important

first step and demonstrates high potential to inform what works for supporting university students' stress management and coping capacity.

Conclusion

This dissertation sought to (1) explore university students experiences with stress over time and the impact of stress on how students adjust to the university environment, as well as (2) examine the effectiveness and acceptability of supporting students' stress-management and coping capacity through curriculum-embedded and self-directed programming. Results highlight the enduring effect of early stress on subsequent adjustment outcomes and that students' stress and coping can be influenced through sharing evidence-based stress-management and healthy coping information, instructionally or for self-directed use. The present findings serve as a foundational evidence-base to inform how low-intensity, individual-level supports for stress-management and healthy coping can be effectively scaled up and integrated within the larger system of higher education.

Furthermore, this research directly informs approaches to supporting university students' stress-management and coping capacity during a critical developmental period. Driven by developmental and psychosocial theories (Arnett, 2000; Stallman, 2020), the present dissertation underscores the importance of considering developmental needs when designing programming for emerging adults while documenting effective ways to promote the availability of and access to evidence-based stress-management and healthy coping strategies. In addition, the present series of studies demonstrate the potential to expand low-intensity supports within the Stepped-Care2.0 framework (Cornish, 2020) beyond the institutional health and wellness centre as a supplement to existing services. This can potentially improve access to support for all while lowering the burden of demand for services through the health centre.

In conclusion, this dissertation serves as one potential avenue informing the implementation of recommendations outlined in the national standard (MHCC & CSA, 2020) while offering a transformative and pragmatic approach to enhancing university students' stress management and coping capacity in demanding higher education settings.

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Appendices

Appendix A: REB Approval Certificates for Studies 1, 2, and 3

Research Ethics Board Office
James Administration Bldg.
845 Sherbrooke Street West. Rm 429
Montreal, QC H3A 0G4

Tel: (514) 398-6831
Fax: (514) 398-4644
Website:
www.mcgill.ca/research/researchers/compliance/human/

Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 242-1214
Project Title: Risk and Protective Factors Predicting Students' Adjustment and Coping in the First Two Years of University
Principal Investigator: Mélanie Joly
Department: Educational and Counselling Psychology
Status: PhD Student
Supervisor: Prof. Nancy Heath

Approval Period: February 17, 2015 – February 16, 2016

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Research Ethics Administrator

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* All research involving human participants requires review on an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date.
* When a project has been completed or terminated a Study Closure form must be submitted.
* Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.

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REB File Number:	105-0719
Project Title:	Re-delivery and Evaluation of a Stress-Management and Well-Being Program for Pre-service Teachers
Principal Investigator:	Nancy Lee Heath
Department:	Educational & Counselling Psychology
Approval Expiry Date:	**09-Sep-2024**

- The *REB-2* reviewed and approved the Continuing Review application for the above project on 22-Aug-2023.
- Approval is granted only for the research and purposes described.
- The PI must inform the REB if there is a termination or interruption of their affiliation with the University.
- An **Amendment** form must be used to submit any proposed modifications to the approved research. Modifications to the approved research must be reviewed and approved by the REB before they can be implemented.
- Changes to funding or adding new funding to a previously unfunded study must be submitted as an Amendment.
- A **Continuing Review** form must be submitted before the above expiry date. Research cannot be conducted without a current ethics approval. Submit 2-3 weeks ahead of the expiry date. A total of 5 renewals are permitted after which time a new application will need to be submitted.
- A **Termination** form must be submitted to inform the REB when a project has been completed or terminated.
- A **Reportable New Information** form must be submitted if any unanticipated issues that may increase the risk level to participants or that may have other ethical implications or to report any protocol deviations that did not receive prior REB approval.
- The REB must be promptly notified of any new information that may affect the welfare or consent of participants.
- The REB must be notified of any suspension or cancellation imposed by a funding agency or regulatory body that is related to this study.
- The REB must be notified of any findings that may have ethical implications or may affect the decision of the REB.

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CERTIFICATE OF ETHICS APPROVAL

REB File Number:	21-10-040
Project Title:	uCope: Resource delivery for healthy coping and resilience building in university students
Faculty Principal Investigator:	Nancy Lee Heath
Department:	Educational & Counselling Psychology
Sponsor/Funding Agency (if applicable):	Faculty of Education Internal Funds

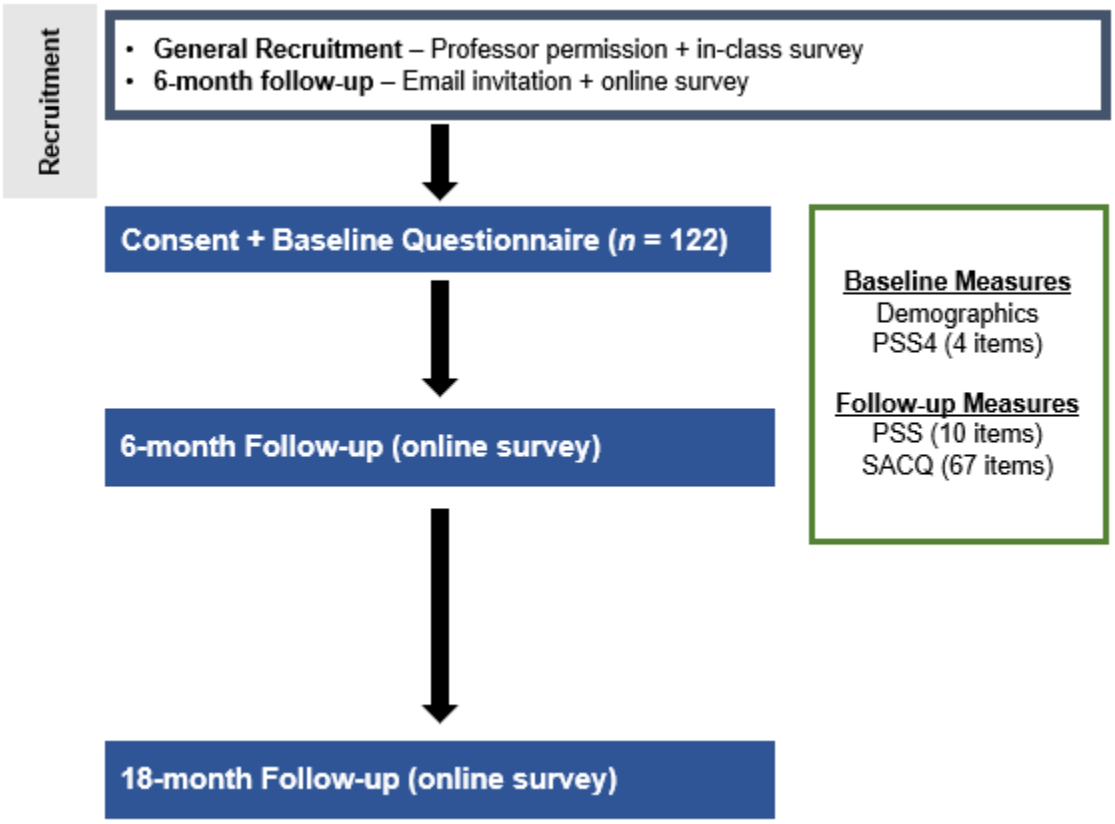
Approval Period:	
FROM	**TO**
02-Feb-2022	01-Feb-2023

The *REB-II* reviewed and approved this project by Delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct For Research Involving Humans.

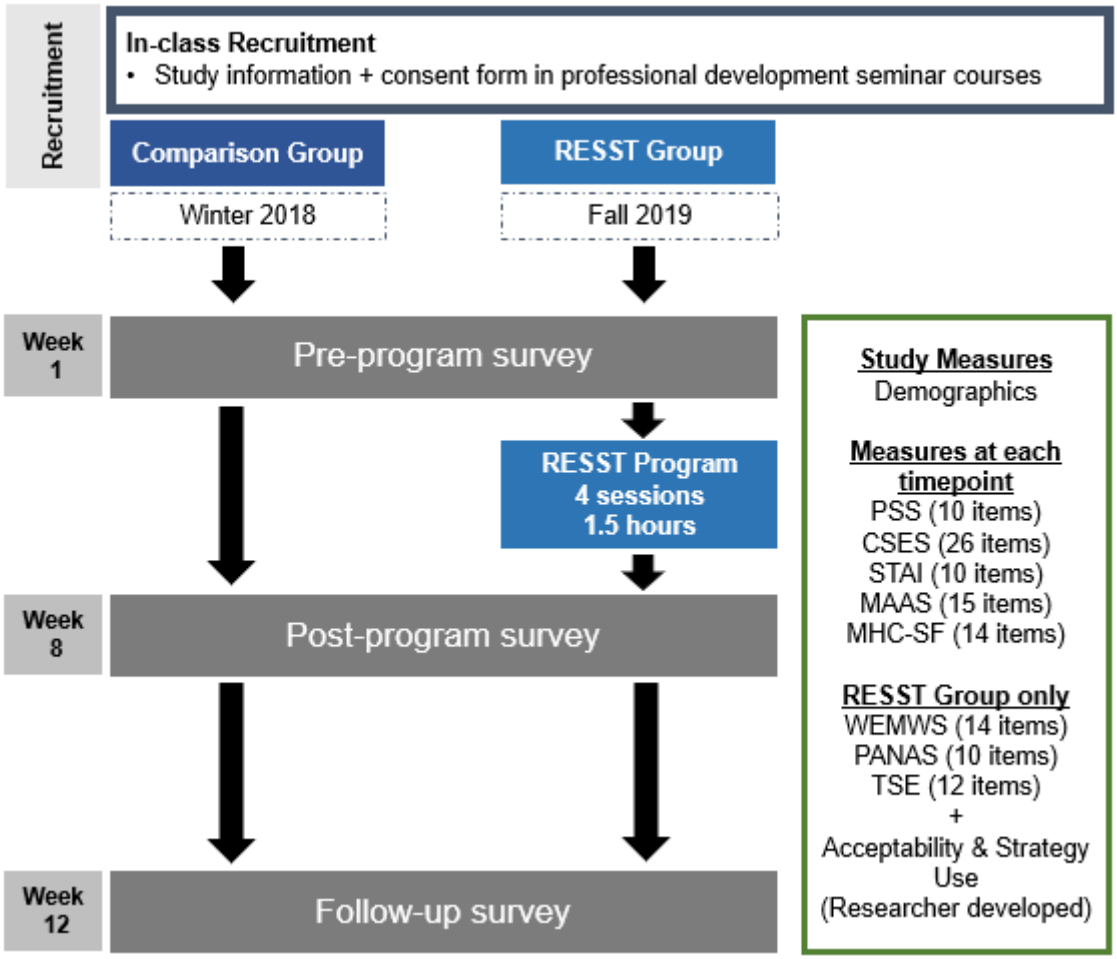
* Approval is granted only for the research and purposes described.
* Modifications to the approved research must be reviewed and approved by the REB before they can be implemented.
* A Request for Renewal form must be submitted before the above expiry date. Research cannot be conducted without a current ethics approval. Submit 2-3 weeks ahead of the expiry date.
* When a project has been completed or terminated, a Study Closure form must be submitted.
* Unanticipated issues that may increase the risk level to participants or that may have other ethical implications must be promptly reported to the REB. Serious adverse events experienced by a participant in conjunction with the research must be reported to the REB without delay.
* The REB must be promptly notified of any new information that may affect the welfare or consent of participants.
* The REB must be notified of any suspension or cancellation imposed by a funding agency or regulatory body that is related to this study.
* The REB must be notified of any findings that may have ethical implications or may affect the decision of the REB.

Appendix B: Procedure Flowcharts for Studies 1, 2, and 3

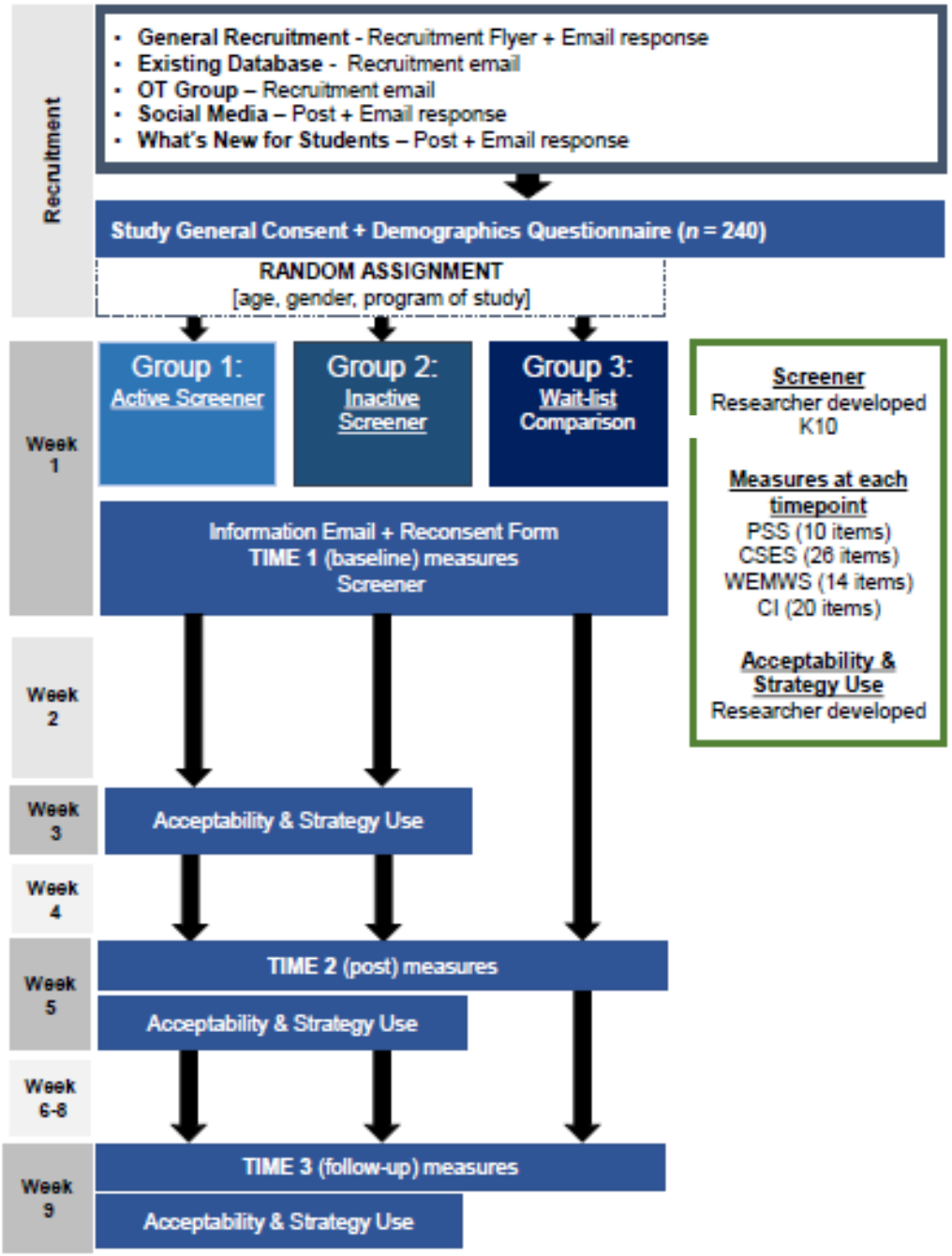
Study 1 Data Collection Flowchart



Study 2 Data Collection Flowchart



Study 3 Data Collection Flowchart



Appendix C: Study Measures
Study 1

Perceived Stress Scale – 4 (Cohen et al., 1983)

The questions below ask you about your feelings and thoughts during the **LAST MONTH**. In each case, please use the scale below to indicate how often you felt or thought a certain way.

Never	Almost Never	Sometimes	Fairly Often	Very Often

1. In the last month, how often have you felt that you were unable to control the important things in your life
2. In the last month, how often have you felt confident about your ability to handle your personal problems?
3. In the last month, how often have you felt that things were going your way
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Student Adaptation to College Questionnaire (Baker & Syrik, 1984)

Sample Questions by Subscale

Academic Adjustment	• I've been keeping up to date on my academic work. • I'm not doing well enough academically for the amount of work I put in. • Lately, I have been giving a lot of thought to dropping out of [university] altogether. • I am satisfied with the level of at which I am performing academically.
Social Adjustment	• I am very involved with social activities in [university]. • I am having difficulty feeling at ease with other people at [university]. • I feel I am very different from other students at [university] in ways I don't like. • I am quite satisfied with my social life at [university].
Emotional Adjustment	• Lately I have been feeling blue and moody a lot. • I really haven't had much motivation for studying lately. • I haven't been sleeping very well. • I haven't been able to control my emotions very well lately.
Institutional Attachment	• I am pleased now about my decision to go to [university]. • I wish I were at another college or university. • I expect to stay at this [university] for a bachelor's degree. • Lately, I have been giving a lot of thought to transferring to another [university].

Study 2

Perceived Stress Scale (Cohen et al., 1983) – also used in study 3

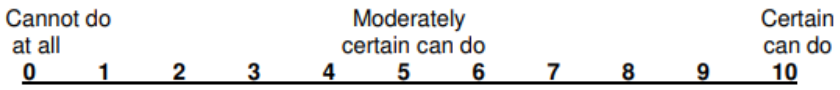
The questions in this scale ask you about your feelings and thoughts during the **last two weeks**. In each case, you will be asked to indicate *how often* you felt or thought a certain way by using the scale below.

Never	Almost Never	Sometimes	Fairly Often	Very Often

1. In the last two weeks, how often have you been upset because of something that happened unexpectedly?
2. In the last two weeks, how often have you felt that you were unable to control the important things in your life?
3. In the last two weeks, how often have you felt nervous and "stressed"?
4. In the last two weeks, how often have you felt confident about your ability to handle your personal problems?
5. In the last two weeks, how often have you felt that things were going your way?
6. In the last two weeks, how often have you found that you could not cope with all the things that you had to do?
7. In the last two weeks, how often have you been able to control irritations in your life?
8. In the last two weeks, how often have you felt that you were on top of things?
9. In the last two weeks, how often have you been angered because of things that were outside of your control?
10. In the last two weeks, how often have you felt difficulties were piling up so high that you could not overcome them?

Coping Self-Efficacy Scale (Chesney et al., 2006) – also used in study 3

Over the **last two weeks**, when things weren't going well for you, or when you were having problems, how confident or certain were you that you could do the following?



For each of the following items, write a number from 0 –10, using the scale above.

1. Keep from getting down in the dumps.
2. Talk positively to yourself.
3. Sort out what can be changed, and what can not be changed.
4. Get emotional support from friends and family.
5. Find solutions to your most difficult problems.
6. Break an upsetting problem down into smaller parts.
7. Leave options open when things get stressful.
8. Make a plan of action and follow it when confronted with a problem.
9. Develop new hobbies or recreations.
10. Take your mind off unpleasant thoughts.
11. Look for something good in a negative situation.
12. Keep from feeling sad.
13. See things from the other person's point of view during a heated argument.
14. Try other solutions to your problems if your first solutions don't work.
15. Stop yourself from being upset by unpleasant thoughts.
16. Make new friends.
17. Get friends to help you with the things you need.
18. Do something positive for yourself when you are feeling discouraged.
19. Make unpleasant thoughts go away.
20. Think about one part of the problem at a time.
21. Visualize a pleasant activity or place.
22. Keep yourself from feeling lonely.
23. Pray or meditate.
24. Get emotional support from community organizations or resources.
25. Stand your ground and fight for what you want.
26. Resist the impulse to act hastily when under pressure.

Mindful Attention Awareness Scale (Brown & Ryan, 2009)

Below is a collection of statements about your everyday experience. Using the 1–6 scale below, please indicate how frequently or infrequently you had each experience **over the last two weeks.** Please answer according to what really reflects your experience rather than what you think your experience should be.

1	2	3	4	5	6
Almost always	Very frequently	Somewhat frequently	Somewhat infrequently	Very infrequently	Almost never

1. I could be experiencing some emotion and not be conscious of it until some time later.
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
3. I find it difficult to stay focused on what's happening in the present.
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
6. I forget a person's name almost as soon as I've been told it for the first time.
7. It seems I am "running on automatic" without much awareness of what I'm doing.
8. I rush through activities without being really attentive to them.
9. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.
10. I do jobs or tasks automatically, without being aware of what I'm doing.
11. I find myself listening to someone with one ear, doing something else at the same time.
12. I drive places on "automatic pilot" and then wonder why I went there.
13. I find myself preoccupied with the future or past.
14. I find myself doing things without paying attention.
15. I snack without being aware that I'm eating.

Mental Health Continuum – Short Form (Keyes, 2002)

Use the rating scale below to respond to each question.

Never	Once or twice	About once a week	About two or three times a week	Almost every day	Everyday
1	2	3	4	5	6

During **the past two weeks**, how often did you feel…

1. happy
2. interested in life
3. satisfied with life
4. that you had something important to contribute to society
5. that you belonged to a community (like a social group, or your neighborhood)
6. that our society is a good place, or is becoming a better place, for all people
7. that people are basically good
8. that the way our society works makes sense to you
9. that you liked most parts of your personality
10. good at managing the responsibilities of your daily life
11. that you had warm and trusting relationships with others
12. that you had experiences that challenges you to grow and become a better person
13. confident to think or express your own ideas and opinions
14. that your life has a sense of directions or meaning to it

Warwick Edinburgh Mental Well-Being Scale (Tennant et al., 2007) – also used in study 3

Below are some statements about feelings and thoughts. Please indicate the response option that best describes your experience of each **over the last 2 weeks**.

None of the time	Rarely	Some of the time	Often	All of the time

1. I've been feeling optimistic about the future
2. I've been feeling useful
3. I've been feeling relaxed
4. I've been feeling interested in other people
5. I've had energy to spare
6. I've been dealing with problems well
7. I've been thinking clearly
8. I've been feeling good about myself
9. I've been feeling close to other people
10. I've been feeling confident
11. I've been able to make up my own mind about things
12. I've been feeling loved
13. I've been interested in new things
14. I've been feeling cheerful

State Trait Anxiety Inventory – Trait Short Form (STAI; Spielberger et al., 1983)

A number of statements which people have used to describe themselves are given below. Read each statement and then indicate your response to each statement rating how you **generally felt over the last two weeks.**

Almost Never	Sometimes	Often	Almost Always

1. I felt nervous and restless
2. I felt satisfied with myself
3. I wished I could be as happy as others seem to be
4. I felt like a failure
5. I worried too much over something that really didn't matter
6. I lacked self-confidence
7. I felt secure
8. I felt inadequate
9. I was a steady person
10. I got in a state of tension or turmoil as I thought over my recent concerns and interests.

Positive and Negative Affect Schedule (Thompson, 2007)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate the extent you have felt this way **over the past two weeks**.

Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud

Teacher Self-Efficacy Scale (Schwarzer et al., 1999)

Please indicate the degree to which you identify with each of the following statements about yourself as a teacher using the scale below.

Not at all true	Barely true	Moderately true	Exactly true

1. I am convinced that I am able to teach successfully all relevant subject content to even the most difficult students.
2. I know that I can maintain a positive relationship with parents, even when tensions arise.
3. When I try really hard, I am able to reach even the most difficult students.
4. I am convinced that, as time goes by, I will continue to become more and more capable of helping to address my students' needs.
5. Even if I am disrupted while teaching, I am confident that I can maintain my composure and continue to teach well.
6. I am confident in my ability to be responsive to my students' needs, even if I am having a bad day.
7. If I try hard enough, I know that I can exert a positive influence on both the personal and academic development of my students.
8. I am convinced that I can develop creative ways to cope with system constraints (such as budget cuts and other administrative problems) and continue to teach well.
9. I know that I can motivate my students to participate in innovative projects.
10. I know that I can carry out innovative projects, even when I am opposed by skeptical colleagues.

Program Evaluation Questionnaire – Researcher Developed for Study 2

1. After participating in this stress management and well-being program for pre-service teachers, I feel I learned:

A lot	A medium amount	A small amount	Nothing

2. I found that the information presented in this program was relevant and met my expectations.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

3. Overall, the presentations for this program were informative and understandable.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

4. Overall, I found that this program presented valuable strategies and techniques.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

5. Overall, this program was a valuable professional/personal development experience for me.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

6. I would recommend this program to other pre-service teachers.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

7. I would want this program to be a mandatory part of the B.Ed. Curriculum.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

8. Please indicate how well you now understand the following constructs? *(Please tick the appropriate box)*.

CONSTRUCT	Not Very Well	Understand Quite Well	Understand Very Well	Already Knew
Self-care				
Self-compassion				
Self-management				
Social-connectedness				
Emotion Regulation				
Emotion Awareness				
Self-Regulation				
Mindfulness				

9. Please indicate how often you anticipate using these strategies for stress-management to enhance your well-being? (Please tick appropriate box)

STRATEGY	**Never: I don't need to use these strategies**	**Never: I don't like this technique**	**Sometimes**	**Fairly often**	**Everyday**
Coming to your senses					
Breathing exercises					
Three Good Things					
Pleasant Experiences Calendar					
Body Scan					
Self-Care					
Progressive Muscle Relaxation					
Mindful Eating					
Loving-Kindness Meditation					
Being your own best friend					
Thought distancing					
Mindfulness practice					

10. How would you rate the program overall?

Excellent	Good	Neutral	Satisfactory	Poor

10a. Please explain your reasons for this rating.

11. Please write down any general comments about this program that you would like us to know.

Coping Index (Stallman, 2017)

Using the following scale, rate how often you do the following things when you are feeling stressed or distressed.

(0) I don't do this at all	(1) I do this occasionally	(2) I do this often	(3) I do this most of the time

1) Take a few deep breaths
2) Eat
3) Use positive self-talk
4) Yell or argue with others
5) Meditate
6) Stay focused on what is happening in the present moment
7) Spend a lot of time on your own
8) Do things that distract you
9) Have thoughts about suicide
10) Do relaxing activities
11) Do things to physically hurt yourself without suicidal intent
12) Do something enjoyable with a friend
13) Drink alcohol
14) Take drugs
15) Talk things over with family or friends
16) Stop doing activities that you usually enjoy
17) Talk to a health professional or counsellor
18) Ruminate
19) Pray
20) Have negative self-talk

Screener Measure – Researcher Developed for Study 3

The questions in this survey ask about your experiences of stress, coping, and social support/connectedness. Please select the one response for each item that best describes how you feel. Note that you may recognize that some questions are repeated, please answer the questions even if they are repeated.					
1. In the past month, how often have you experienced stress and/or mental health or well-being difficulties at a level that interfered with your ability to engage in the activities of everyday life (e.g., school, work, relationships, health-promoting behaviours, etc.)?	*Almost never*	*Infrequently*	*About half the time*	*Frequently*	*Almost always*
2. As you begin your undergraduate studies, to what extent do you believe that you have adequate financial resources such that finances will not be a significant source of stress?	*Strongly disagree*	*Slightly disagree*	*Neutral/Not sure*	*Slightly agree*	*Strongly agree*
3. Generally, how frequently do you engage in <u>healthy</u> coping strategies to manage your stress (e.g., talking to friends, listening to music, reaching out to others for support, physical activity, contact with nature, prayer, meditation)?	*Almost never*	*Infrequently*	*About half the time*	*Frequently*	*Almost always*
4. Generally, how frequently do you engage in <u>unhealthy</u> coping behaviours to manage your stress (alcohol/substance use, self-injury, excessive gaming, etc.)?	*Almost never*	*Infrequently*	*About half the time*	*Frequently*	*Almost always*
5. To what extent do you believe that you have experienced more significant stressful life events (e.g., trauma, adverse life experiences, personal loss) than your peers?	*Strongly disagree*	*Slightly disagree*	*Neutral/Not sure*	*Slightly agree*	*Strongly agree*
6. To what extent do you participate in a religious and/or spirituality-based community (e.g., church, meditation group) and/or do you engage in personal spiritual practice (e.g., prayer, contemplative practices)?	*Not at all*	*Infrequently*	*Sometimes*	*Frequently*	*Very frequently*

The questions in this scale ask you about your feelings and thoughts <u>during the last month</u>. In each case, you will be asked to indicate *how often* you felt or thought a certain way.					
7. In the last month, how often have you felt that you were unable to control the important things in your life?	*Never (0)*	*Almost Never (1)*	*Sometimes (2)*	*Fairly Often (3)*	*Very Often (4)*
8. In the last month, how often have you felt confident about your ability to handle your personal problems?	*Never (0)*	*Almost Never (1)*	*Sometimes (2)*	*Fairly Often (3)*	*Very Often (4)*
9. In the last month, how often have you felt that things were going your way?	*Never (0)*	*Almost Never (1)*	*Sometimes (2)*	*Fairly Often (3)*	*Very Often (4)*
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	*Never (0)*	*Almost Never (1)*	*Sometimes (2)*	*Fairly Often (3)*	*Very Often (4)*

When things aren't going well for you, or when you're having problems, ***how confident or certain*** **are you that you can do the following:**	
11. Break an upsetting problem down into smaller parts	*0 Cannot do at all – 5 Moderately certain can do – 10 Certain can do*
12. Stop yourself from being upset by unpleasant thoughts	*0 Cannot do at all – 5 Moderately certain can do – 10 Certain can do*
13. Get emotional support from friends and family	*0 Cannot do at all – 5 Moderately certain can do – 10 Certain can do*
14. Find solutions to your most difficult problems	*0 Cannot do at all – 5 Moderately certain can do – 10 Certain can do*

Indicate *how often* you feel the way described in each of the following statements. Select one response for each.				
15. I lack companionship	*Never (1)*	*Rarely (2)*	*Sometimes (3)*	*Often (4)*
16. I feel left out.	*Never (1)*	*Rarely (2)*	*Sometimes (3)*	*Often (4)*
17. I feel isolated from others.	*Never (1)*	*Rarely (2)*	*Sometimes (3)*	*Often (4)*

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about the statement.							
18. I have a special person who is a real source of comfort to me	*Very strongly disagree (1)*	*Strongly disagree (2)*	*Mildly disagree (3)*	*Neutral (4)*	*Mildly agree (5)*	*Strongly agree (6)*	*Very strongly agree (7)*
19. I get the emotional help and support I need from my family	*Very strongly disagree (1)*	*Strongly disagree (2)*	*Mildly disagree (3)*	*Neutral (4)*	*Mildly agree (5)*	*Strongly agree (6)*	*Very strongly agree (7)*
20. I can talk about my problems with my friends	*Very strongly disagree (1)*	*Strongly disagree (2)*	*Mildly disagree (3)*	*Neutral (4)*	*Mildly agree (5)*	*Strongly agree (6)*	*Very strongly agree (7)*

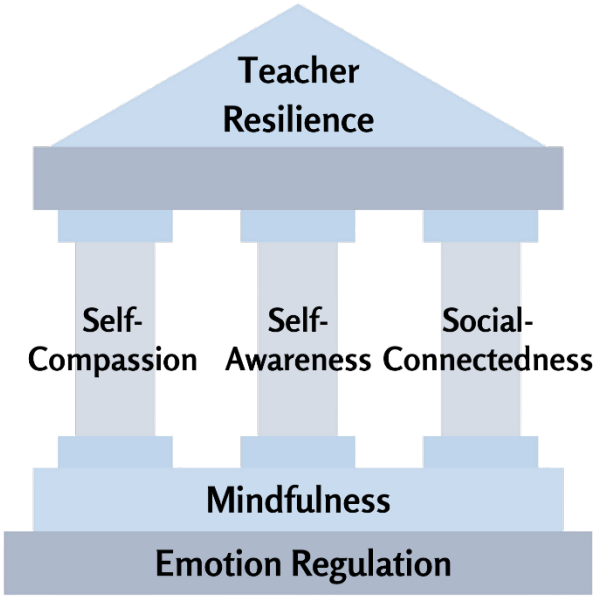
Following are a number of statements that reflect various ways in which we view ourselves. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly disagree and 6 = Strongly agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered.					
21. I feel close to people	*Strongly disagree*	*Disagree*	*Mildly disagree*	*Mildly agree*	*Agree*
22. I feel disconnected from the world around me	*Strongly disagree*	*Disagree*	*Mildly disagree*	*Mildly agree*	*Agree*
23. Even around people I know, I don't feel that I really belong	*Strongly disagree*	*Disagree*	*Mildly disagree*	*Mildly agree*	*Agree*
24. I feel understood by the people I know	*Strongly disagree*	*Disagree*	*Mildly disagree*	*Mildly agree*	*Agree*

Acceptability and Strategy Use Questionnaire – Researcher Developed for Study 3

Please indicate the degree to which you agree or disagree with the statements below (strongly disagree to strongly agree) over the last two weeks:				
1. I found the website useful for me.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
2. I found the content in the website was presented in an engaging manner.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
3. I found that the website presented valuable strategies and techniques.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
4. I would recommend this website to other university students.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
5. The strategies presented in the website helped me better understand how to manage my stress and improve my wellness.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
6. The strategies presented in the website were easy to understand.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
7. I feel confident in my understanding of the suggested strategies in the website.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly Agree*
8. The website has motivated me to try out these strategies.	*Strongly disagree*	*Disagree*	*Agree*	*Strongly agree*
9. Over the past two weeks, how often did you use the strategies presented in the website?	*Every day*	*Frequently*	*Sometimes*	*Never*
10. Over the coming weeks, I plan to use the strategies presented in the website:	*Every day*	*Frequently*	*Sometimes*	*Never*
11. Over the past two weeks, how would you rate the impact of the strategies presented in the website on your well-being?	*No impact*	*Low impact*	*Somewhat impacted*	*Highly impacted*
12. Please explain your reason for this rating.				

Appendix D: Supplemental Materials

Study 2: Regulating Emotions and Stress for pre-Service Teachers (RESST) Program Content Overview



Total length: 6 hours (presented as 4 modules of 1.5 hours each)
Core topics covered within each module include:

- *Module 1*
  Emotion regulation and mindfulness
- *Module 2*
  Self-compassion (addressing our "inner critic," self-care)
- *Module 3*
  Self-awareness (awareness around problematic student behaviour, student-teacher relationship, time management)
- *Module 4*
  Social connectedness (mentorship, advocacy) and program recap

The objectives of the RESST program are to (1) enhance pre-service teachers' well-being by providing evidence-based strategies to help build resilience and protect against the effects of stress in the teaching profession and (2) share strategies for both pre-service teachers and their students, so they can practice strategies together and collectively enhance their ability to deal with stress.

To ensure that program sessions remain both informative and engaging for participants while incorporating guided practice of strategies, all sessions additionally include:

(i) video clips of in-service teacher testimonials related to the program topics,
(ii) in-session strategy practice,
(iii) suggested at-home practice, detailed within a resource sheet accompanying each session,
(iv) interactive activities to practice the application of strategies to personal and classroom scenarios,
(v) information on how to teach the strategies to students and/or make them part of a regular classroom routine.

Study 3: Web-based Resource
Content Overview – Home Page

McGill | Faculty of Education **EDUCATION FOR MENTAL HEALTH RESILIENCE**

What is Mental Health Resilience?

Education for Mental Health Resilience was developed to help students build their capacity to effectively cope in demanding university environments. The collection of resources on this website are designed specifically for students to share foundational mental health knowledge as well as specific research-informed practices to build mental health resilience.

Building Mental Health Resilience

The information is presented using different formats including **short videos**, **infographics**, and **audio recordings** for quick practice.

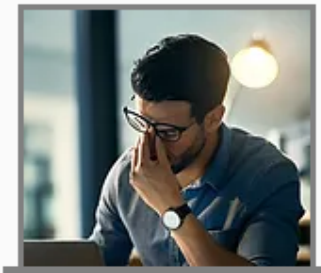
In these resources you can find both **(1)** information related to mental health and resilience and **(2)** guidance on how to apply this information to build your own mental health resilience.

Mental Health Resilience Areas

Understanding

Before we can start using strategies to enhance our mental health, let's understand how they were developed and why they work.

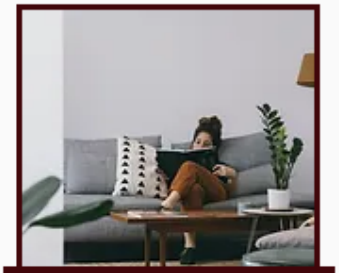
Learn More



Managing Stress

It's easy to get overwhelmed by academic and day to day stressors. Let's see how we can better cope with and manage this stress.

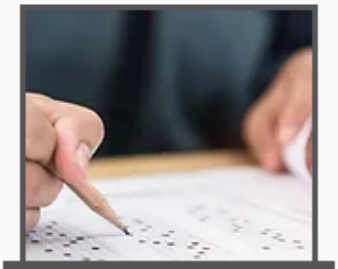
Learn More



Well-Being

It's important to know about what helps us stay well! Let's learn about how we can focus on our well-being and build it during our university years.

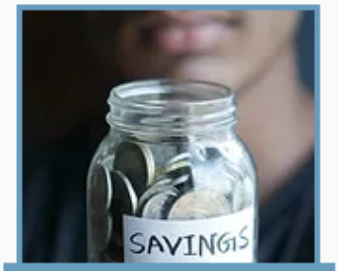
Learn More



Enhancing Performance

High stakes environments such as University can be stressful. So, how can we enhance our performance while maintaining positive mental health?

Learn More



Adulting

Adulting comes with new responsibilities which can be overwhelming. Let's learn how to manage our stress around this new found independence.

Learn More

Socializing

Maintaining social connections and feeling supported are important tools to buffer against the effects of stress. So, how can we create and maintain social connections during the university years?

Learn More

Table 1a

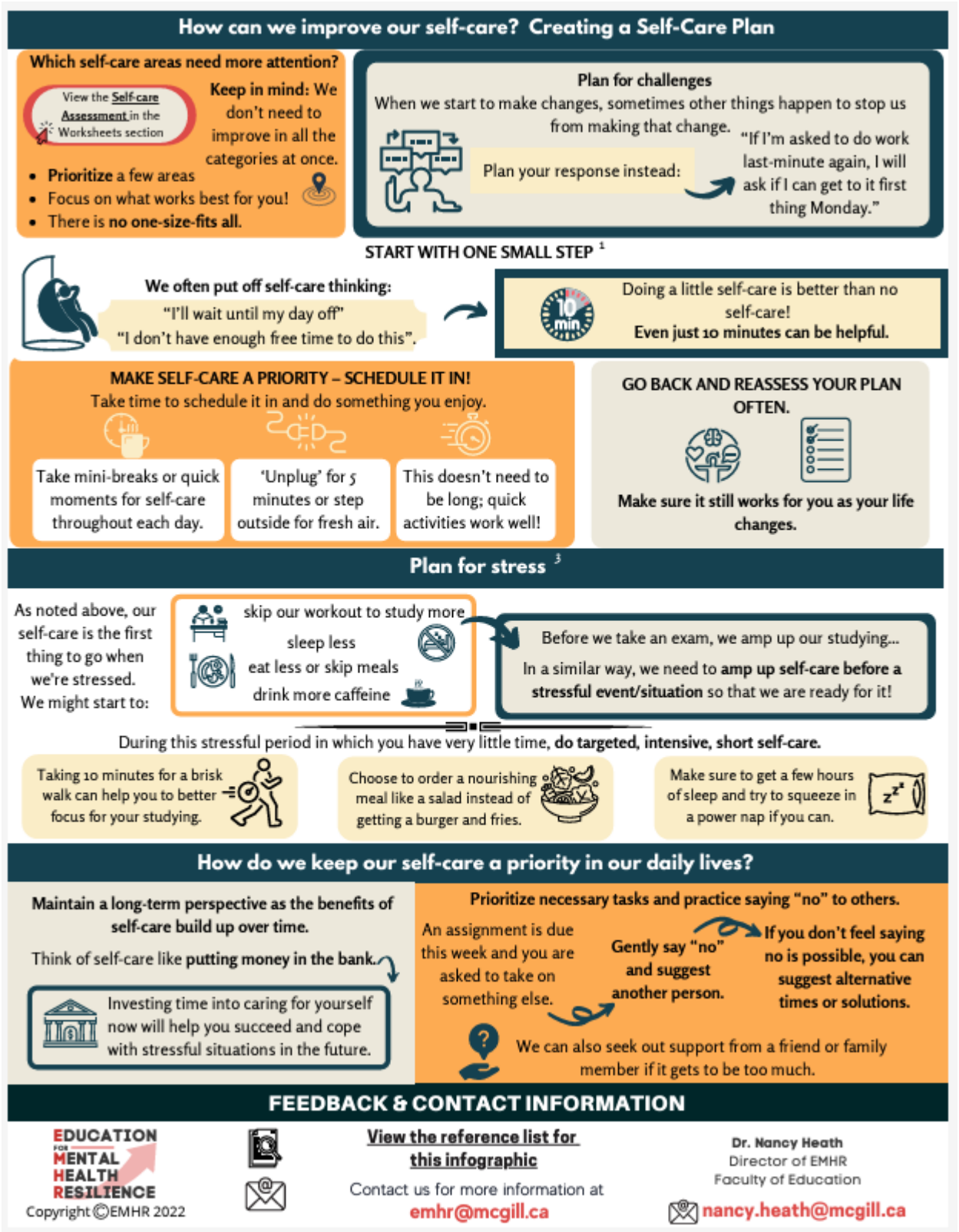
List of Resource Titles and the Website Sections in which They are Presented.

Resource Heading/Title	Format	Website section where resource is presented					
		Understanding	Managing Stress	Enhancing Performance	Adulting	Socializing	Well-Being
Do you know the facts?	Text and Graphics	X					
What is mental health vs. mental illness	Text and Graphics	X					
Adulting and you	Text and Graphics	X					
Is it healthy or unhealthy coping?	Text and Graphics	X					
What is stress and how does it work?	Video		X				
How do emotions play a part?	Video		X				
How can we cope with stress?	Video		X				
What is mindfulness?	Video		X				
Why use mindfulness?	Video		X				
What is perfectionism?	Video			X			
Self-compassion, why do I need it?	Video			X			
Help! I can't stop procrastinating.	Video			X			
What's motivation? How do our self-beliefs impact it?	Video			X			X
"Why should I care?" is important	Video			X			X
How can I make a plan?	Video			X			X
What is adulting and how do I self-advocate?	Video				X		
What is household management?	Video				X		
How do I navigate relationships as an adult?	Video				X		
How can I plan my career?	Video				X		
How can I deal with loneliness?	Video					X	
How can I seek help and give help?	Video					X	
Test anxiety	Interactive Infographic		X	X			
Enhancing positive awareness	Interactive Infographic		X				X
Enhancing student resilience	Interactive Infographic		X				X
Help-seeking	Interactive Infographic		X		X	X	
Perspective-taking	Interactive Infographic		X	X	X		
Financial Wellness	Interactive Infographic		X		X		
Physical Well-being	Interactive Infographic		X				X
Mindfulness	Interactive Infographic		X				X
Self-care	Interactive Infographic		X				X
Self-criticism & Self-compassion	Interactive Infographic		X	X	X		X
Sleep Hygiene	Interactive Infographic		X				X
Dealing with uncomfortable emotions	Interactive Infographic		X		X		
Managing expectations	Interactive Infographic		X	X			

Resource Heading/Title	Format	Website section where resource is presented					
		Understanding	Managing Being Stress	Enhancing	Adulting Performance	Socializing	Well-
Effective communication	Interactive Infographic			X	X	X	
Improve your time management	Interactive Infographic			X	X		
Study skills & procrastination	Interactive Infographic			X	X		
Motivation	Interactive Infographic			X	X		X
Dealing with breakups	Interactive Infographic				X	X	
Dealing with loneliness	Interactive Infographic				X	X	
Help-giving	Interactive Infographic				X	X	X
Smart nutrition	Interactive Infographic				X		X
School involvement & activities	Interactive Infographic					X	
Maintaining social support in university	Interactive Infographic					X	
Self-compassion meditation	Strategy postcard		X	X	X	X	X
Sleep relaxation practice	Strategy postcard		X	X	X	X	X
Progressive muscle relaxation	Strategy postcard		X	X	X	X	X
Calming breath	Strategy postcard		X	X	X	X	X
Sitting meditation	Strategy postcard		X	X	X	X	X
Body scan	Strategy postcard		X	X	X	X	X
Thought challenge	Strategy postcard		X	X	X	X	X
Gratitude	Strategy postcard		X	X	X	X	X
Enhancing positive awareness	Strategy postcard		X	X	X	X	X
Random acts of kindness	Strategy postcard		X	X	X	X	X
Acting on values	Strategy postcard		X	X	X	X	X
Three good things	Strategy postcard		X	X	X	X	X
Self-care assessment	Worksheets		X	X	X	X	X
Time management assessment	Worksheets		X	X	X	X	X
Stress profile	Worksheets		X	X	X	X	X
Sleep diary	Worksheets		X	X	X	X	X
Dealing with break ups	Podcast					X	
Social network in university	Podcast					X	
Resources presented on their own page of the website							
Belly breathing	Audio						
Calming breath	Audio						
Progressive muscle relaxation	Audio						
Body scan	Audio						
Sitting meditation	Audio						
Thought meditation	Audio						

Resources presented on their own page of the website		
Self-compassion meditation	Audio	
Coming to your senses - hearing	Audio	
Coming to your senses - touch	Audio	
Coming to your senses - sight	Audio	
Yoga nidra	Audio	

Study 3: Interactive Infographic - Sample


How can we improve our self-care? Creating a Self-Care Plan
Which self-care areas need more attention?
View the Self-care Assessment in the Worksheets section
Keep in mind: We don't need to improve in all the categories at once.
Prioritize a few areas
Focus on what works best for you!
There is no one-size-fits all.
Plan for challenges
When we start to make changes, sometimes other things happen to stop us from making that change.
Plan your response instead:
"If I'm asked to do work last-minute again, I will ask if I can get to it first thing Monday."
START WITH ONE SMALL STEP [1]
We often put off self-care thinking:
"I'll wait until my day off"
"I don't have enough free time to do this".
10 min
Doing a little self-care is better than no self-care!
Even just 10 minutes can be helpful.
MAKE SELF-CARE A PRIORITY – SCHEDULE IT IN!
Take time to schedule it in and do something you enjoy.
Take mini-breaks or quick moments for self-care throughout each day.
'Unplug' for 5 minutes or step outside for fresh air.
This doesn't need to be long; quick activities work well!
GO BACK AND REASSESS YOUR PLAN OFTEN.
Make sure it still works for you as your life changes.
Plan for stress [3]
As noted above, our self-care is the first thing to go when we're stressed. We might start to:
skip our workout to study more
sleep less
eat less or skip meals
drink more caffeine
Before we take an exam, we amp up our studying...
In a similar way, we need to amp up self-care before a stressful event/situation so that we are ready for it!
During this stressful period in which you have very little time, do targeted, intensive, short self-care.
Taking 10 minutes for a brisk walk can help you to better focus for your studying.
Choose to order a nourishing meal like a salad instead of getting a burger and fries.
Make sure to get a few hours of sleep and try to squeeze in a power nap if you can.
How do we keep our self-care a priority in our daily lives?
Maintain a long-term perspective as the benefits of self-care build up over time.
Think of self-care like putting money in the bank.
Investing time into caring for yourself now will help you succeed and cope with stressful situations in the future.
Prioritize necessary tasks and practice saying "no" to others.
An assignment is due this week and you are asked to take on something else.
Gently say "no" and suggest another person.
If you don't feel saying no is possible, you can suggest alternative times or solutions.
We can also seek out support from a friend or family member if it gets to be too much.
FEEDBACK & CONTACT INFORMATION
EDUCATION FOR MENTAL HEALTH RESILIENCE
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View the reference list for this infographic
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Faculty of Education
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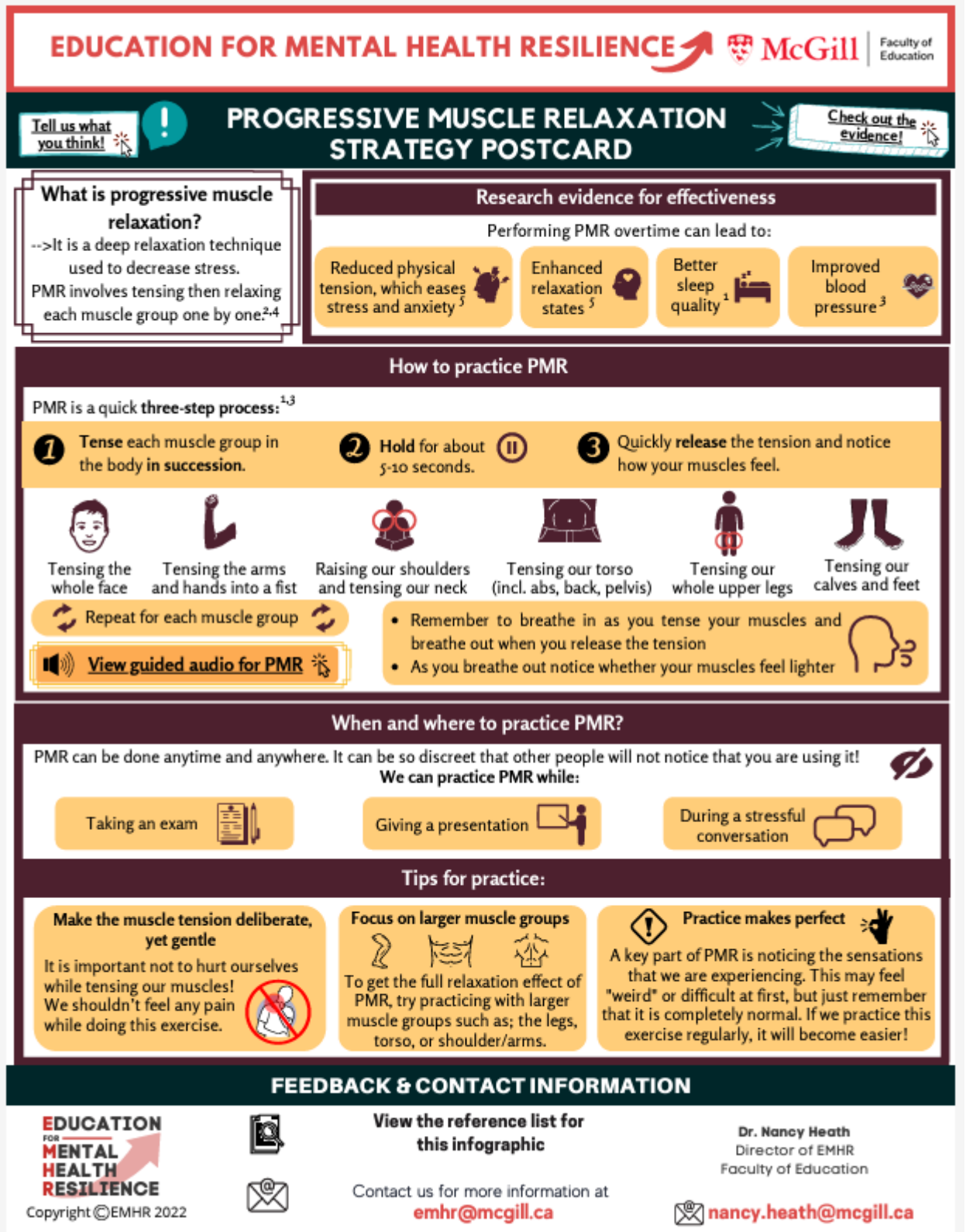
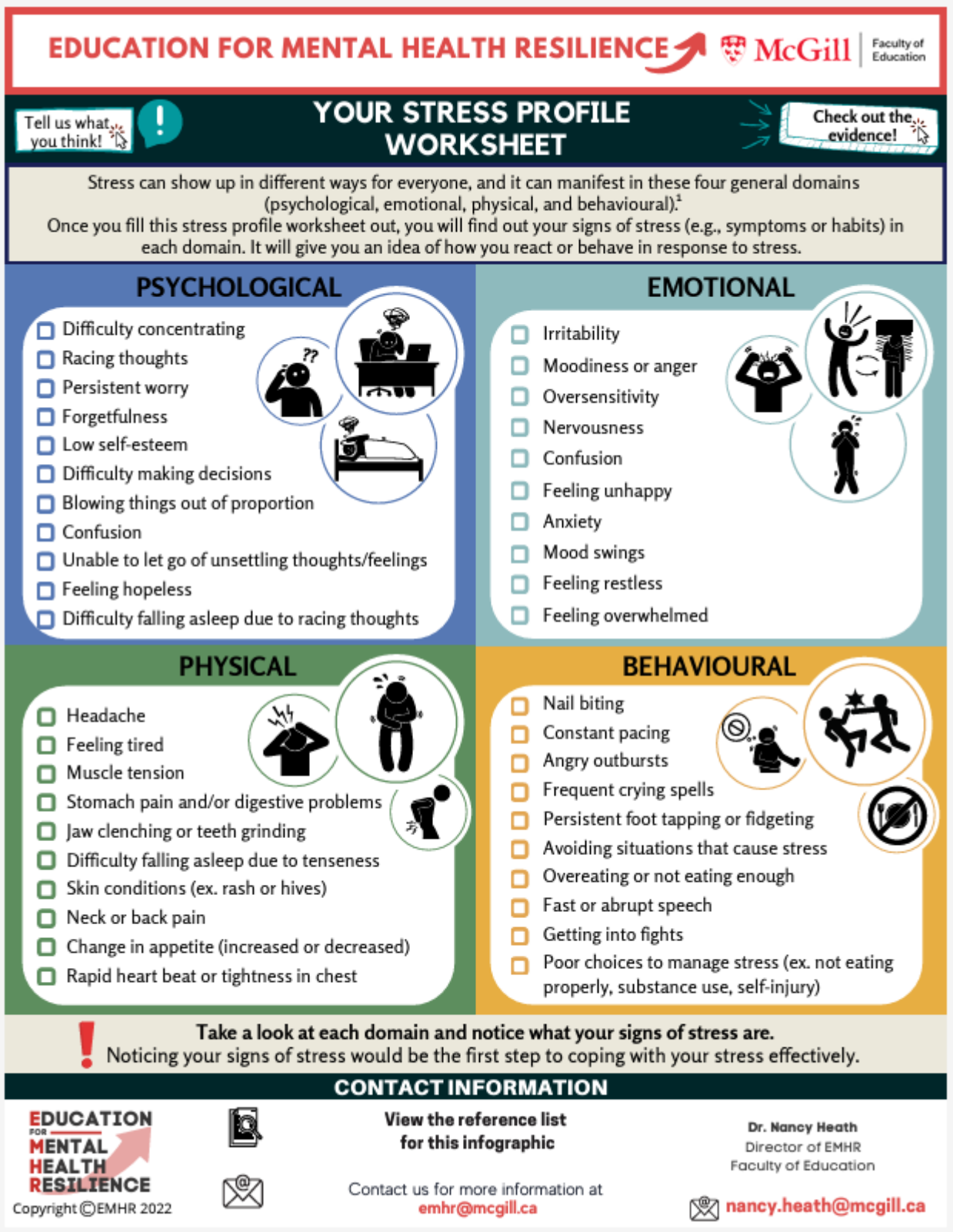
Study 3: Strategy Postcard - Sample



Study 3: Worksheet - Sample



EDUCATION FOR MENTAL HEALTH RESILIENCE

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Tell us what you think!

YOUR STRESS PROFILE WORKSHEET

Check out the evidence!

Stress can show up in different ways for everyone, and it can manifest in these four general domains (psychological, emotional, physical, and behavioural).[1]
Once you fill this stress profile worksheet out, you will find out your signs of stress (e.g., symptoms or habits) in each domain. It will give you an idea of how you react or behave in response to stress.

PSYCHOLOGICAL

- ☐ Difficulty concentrating
- ☐ Racing thoughts
- ☐ Persistent worry
- ☐ Forgetfulness
- ☐ Low self-esteem
- ☐ Difficulty making decisions
- ☐ Blowing things out of proportion
- ☐ Confusion
- ☐ Unable to let go of unsettling thoughts/feelings
- ☐ Feeling hopeless
- ☐ Difficulty falling asleep due to racing thoughts

EMOTIONAL

- ☐ Irritability
- ☐ Moodiness or anger
- ☐ Oversensitivity
- ☐ Nervousness
- ☐ Confusion
- ☐ Feeling unhappy
- ☐ Anxiety
- ☐ Mood swings
- ☐ Feeling restless
- ☐ Feeling overwhelmed

PHYSICAL

- ☐ Headache
- ☐ Feeling tired
- ☐ Muscle tension
- ☐ Stomach pain and/or digestive problems
- ☐ Jaw clenching or teeth grinding
- ☐ Difficulty falling asleep due to tenseness
- ☐ Skin conditions (ex. rash or hives)
- ☐ Neck or back pain
- ☐ Change in appetite (increased or decreased)
- ☐ Rapid heart beat or tightness in chest

BEHAVIOURAL

- ☐ Nail biting
- ☐ Constant pacing
- ☐ Angry outbursts
- ☐ Frequent crying spells
- ☐ Persistent foot tapping or fidgeting
- ☐ Avoiding situations that cause stress
- ☐ Overeating or not eating enough
- ☐ Fast or abrupt speech
- ☐ Getting into fights
- ☐ Poor choices to manage stress (ex. not eating properly, substance use, self-injury)

Take a look at each domain and notice what your signs of stress are.
Noticing your signs of stress would be the first step to coping with your stress effectively.

CONTACT INFORMATION

EDUCATION FOR MENTAL HEALTH RESILIENCE

View the reference list for this infographic

Contact us for more information at emhr@mcgill.ca

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Director of EMHR
Faculty of Education
nancy.heath@mcgill.ca

Study 3: Researcher-Developed Screener Questionnaire – Algorithm and Directing

The questions in this survey ask about your experiences of stress, coping, and social support/connectedness. Please select the one response for each item that best describes how you feel.

Stress and Coping Behaviours

1) **In the past month, how often have you experienced stress and/or mental health or well-being difficulties at a level that interfered with your ability to engage in the activities of everyday life (e.g., school, work, relationships, health-promoting behaviours, etc.)?**
   [Almost never (1), Infrequently, About half the time, Frequently, Almost always (5)]
   Double-weighted
2) **As you begin your undergraduate studies, to what extent do you believe that you have adequate financial resources such that finances will NOT be a significant source of stress?**
   [Strongly disagree (1), Slightly disagree, Neutral/Not sure, Slightly agree, Strongly agree (5)]
   Reverse scored
3) **Generally, how frequently do you engage in healthy coping strategies to manage your stress (e.g., talking to friends, listening to music, reaching out to others for support, physical activity, contact with nature, prayer, meditation)?**
   [Almost never (1), Infrequently, About half the time, Frequently, Almost always (5)]
   Reverse scored
4) **Generally, how frequently do you engage in unhealthy coping behaviours to manage your stress (alcohol/substance use, self-injury, excessive gaming, etc.)?**
   [Almost never (1), Infrequently, About half the time, Frequently, Almost always (5)]
   Double-weighted
5) **To what extent do you believe that you have experienced more significant stressful life events (e.g., trauma, adverse life experiences, personal loss) than your peers?**
   [Strongly disagree (1), Slightly disagree, Neutral/Not sure, Slightly agree, Strongly agree (5)]
   Double-weighted
6) **To what extent do you participate in a religious and/or spirituality-based community (e.g., church/synagogue/mosque, meditation community, etc.) and/or do you engage in personal spiritual practice (e.g., prayer, contemplative practices)?**
   [Not at all (1), Infrequently, Sometimes, Frequently, Very frequently (5)]
   Reverse scored

Perceived Stress Scale – 4 item (Cohen et al., 1984)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way.
[Never (0), Almost never, Sometimes, Fairly often, Very often (4)]

1) **In the last month, how often have you felt that you were unable to control the important things in your life?**
2) **In the last month, how often have you felt confident about your ability to handle your personal problems?**
   Reverse scored
3) **In the last month, how often have you felt that things were going your way?**
   Reverse scored

4) **In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?**

Coping Self-Efficacy Scale (Chesney et al., 2006)

When things aren't going well for you, or when you're having problems, *how confident or certain* are you that you can do the following:

[0 Cannot do at all - 5 Moderately certain can do - 10 Certain can do]

1) **Break an upsetting problem down into smaller parts**
2) **Stop yourself from being upset by unpleasant thoughts**
3) **Get emotional support from friends and family**
4) **Find solutions to your most difficult problems**

UCLA Loneliness Scale – Revised (Russell et al., 1980)

Indicate *how often* you feel the way described in each of the following statements. Select one response for each.

[Never (1), Rarely, Sometimes, Often (4)]

1) **I lack companionship.**
2) **I feel left out.**
3) **I feel isolated from others.**

Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about the statement.

[Very strongly disagree (1), Strongly disagree, Mildly disagree, Neutral, Mildly agree, Strongly agree, Very strongly agree (7)]

1) **I have a special person who is a real source of comfort to me**
2) **I get the emotional help and support I need from my family**
3) **I can talk about my problems with my friends**

Social Connectedness Scale – Revised (Armstrong & Oomen-Early, 2009)

The following are a number of statements that reflect various ways in which we view ourselves. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly disagree and 6 = Strongly agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered.

[Strongly disagree (1), Disagree, Mildly disagree, Mildly agree, Agree, Strongly agree (6)]

1) **I feel close to people**
2) **I feel disconnected from the world around me**
   Reverse scored
3) **Even around people I know, I don't feel that I really belong**
   Reverse scored
4) **I feel understood by the people I know**

Table 1b

Properties of the Researcher Developed Screener Questionnaire by Section

Screener Section	Number of items	Range of possible scores	Cut-off score	Cronbach's alpha	Section development
Stress and Coping Behaviours	6	9 - 45	36	0.465	Researcher-developed
Perceived Stress	4	0 - 16	12	0.783	Perceived Stress Scale - 4 item (Cohen et al., 1984)
Coping Self-efficacy	4	0 - 40	6	0.702	Adapted - Coping Self-Efficacy Scale (Chesney et al., 2006)
Loneliness	3	3 - 12	10	0.809	UCLA Loneliness Scale - Revised (Russell et al., 1980)
Social Support	3	3 - 21	10	0.622	Adapted - Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)
Social Connectedness	4	4 - 24	8	0.839	Adapted - Social Connectedness Scale - Revised (Armstrong & Oomen-Early, 2009)

Note. Cut-off scores were calculated to correspond to the top/bottom 15th percentile of possible scores with reference to population data for each section of the screener.

Table 1c

Screener Algorithm to Facilitate Directing to Personalized Resources and Resource Recommendations for each Tier of Need

Low	**Moderate**	**High**
Scores indicate student is well-positioned to cope with stress and demonstrates low need for support	Scores indicate difficulty in some areas assessed by screener, demonstrates moderate need for support	Scores indicate difficulties across multiple areas assessed by screener (general, interpersonal, and intrapersonal), demonstrates high need for support
Stress and Coping Behaviours < 36	Stress and Coping Behaviours ≥ 36	Stress and Coping Behaviours ≥ 36
&	*OR*	*&*
Perceived Stress < 12	Perceived Stress ≥ 12	Perceived Stress ≥ 12
&	*OR*	*OR*
Coping Self-efficacy > 6	Coping Self-efficacy ≤ 6	Coping Self-efficacy ≤ 6
&	*OR*	*&*
Loneliness < 10	Loneliness ≥ 10	Loneliness ≥ 10
&	*OR*	*OR*
Social Support > 10	Social Support ≤ 10	Social Support ≤ 10
&	*OR*	*OR*
Social Connectedness > 8	Social Connectedness ≤ 8	Social Connectedness ≤ 8
	Resource Recommendations	
1. Understanding (psychoeducation)	**1.** Understanding (psychoeducation)	**1.** Self-directed resources on website
2. Strategy practice postcards	**2.** Self-directed resources on website:	**2.** Resources for formal support
	Managing Stress	*Student Services*
	Enhancing Performance	*Community Resources*
	Well-Being	*Helplines*
	Adulting	**3.** Tips for seeking formal support
	Socializing	

Note. Directing to personalized resources was achieved by creating three unique pages on the website for each tier of need (low, moderate, high; screenshots presented on subsequent pages). Participants in the directed group were automatically directed to one of these three pages based on their scores on the screener. The directing process was automated through the survey platform used in the present study (Qualtrics).

Study 3: Low need personalized recommendations page

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Recommendations for You:

Your responses indicate that you are **well positioned to cope** with stress as a university student.
Nevertheless, you may still benefit from resilience-building support and resources.

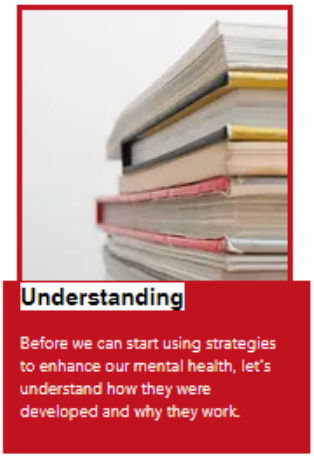
We recommend that you make use of the following EMHR resources:

1 Our **interactive website**, with a variety of different resources to fit your needs:

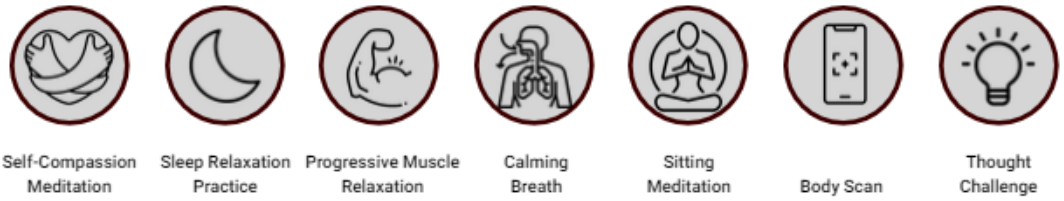
Education4resilience.project.mcgill.ca

2 Specifically, we encourage you to check out:

- The understanding section for some theory-driven information about stress and coping



- Or try the quick practices provided for some on the go resilience building strategies to deal with everyday stressors



Study 3: Moderate need personalized recommendations page

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Recommendations for You:

Your responses indicate **some areas of potential difficulty** in dealing with stress as a university student.

Many students share these experiences. It is common for students to experience some difficulty in coping with stress.

However, we do suggest that you access the below listed resources to build capacity to cope more effectively with challenges that arise.

If you feel you need more formal support, we invite you to visit our resources page which lists various support services available at McGill and in the Montreal community.

You can also view our Help-Seeking infographic which provides information on how to seek support.

We **recommend** that you make use of the following resources:

1. Our **interactive website**, with a variety of resources in different formats.

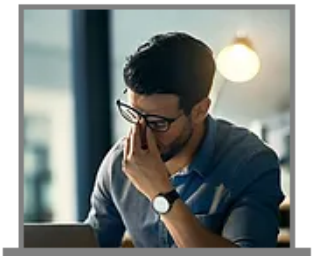
Education4resilience.project.mcgill.ca

2. Specifically, we encourage you to make use of some of the resources within the **six mental health resilience areas** below:

Understanding

For some psychoeducation about stress and coping

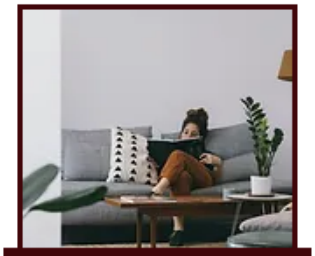
Learn More



Managing Stress

For resources about maintaining positive mental health in stressful environments

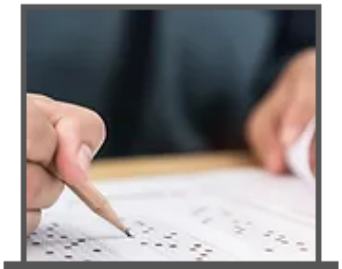
Learn More



Well-Being

For resources on enhancing our well-being in high stress moments

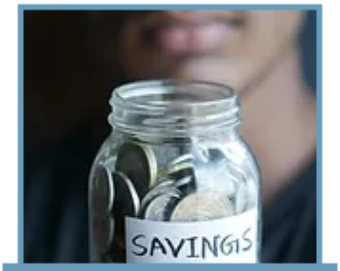
Learn More



Enhancing Performance

For resources on managing academic expectations and enhancing your performance

Learn More



Adulting

For resources on coping with new responsibilities as an adult

Learn More

Socializing

For resources about creating and maintaining social connections during university

Learn More

In pages above, you will find strategies and resources in many different formats:

The brief videos cover topics such as **stress & coping, motivation, performance & expectations** and all present simple strategies to build resilience and cope effectively as a university student. Videos are less than 8 minutes in duration and can be watched in any order that works best for you.

The infographics provide information, strategies, and weblinks around various **stress management techniques** for all six mental health resilience areas.

The quick practices present some on the go, easy to use resilience building **strategies** to cope with everyday stressors.
These practices can be used anywhere and anytime.

Study 3: High need personalized recommendations page

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Recommendations for You:

Based on your responses, you **appear to be experiencing difficulties** that may negatively impact your capacity to cope with stress as a university student.

Although your responses indicate a level of difficulty that is of concern, you are not alone in how you are feeling. We consistently see a proportion of university students struggling substantially with stress at one time or another in their studies.

It is important to address your concerns and to ensure that you get the support you need.

Therefore, we **strongly encourage** you to make use of the **interactive self-directed support** and resources provided on this website. Furthermore, we have provided information to support you in seeking more formal support including tips for how to seek support and specific resources available to you for formal support.

Click each title to see more information.

Self-Directed Support | **Resources for Formal Support** | **Tips for Seeking Support**

SELF-DIRECTED SUPPORT

We **recommend** that you make use of the following EMHR resources:

1 Our interactive website, with a variety of different resources to fit your needs:

Education4resilience.project.mcgill.ca

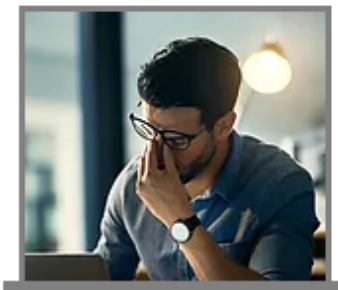
2 Specifically, we encourage you to check out:

Six mental health resilience areas

Understanding

For some psychoeducation about stress and coping

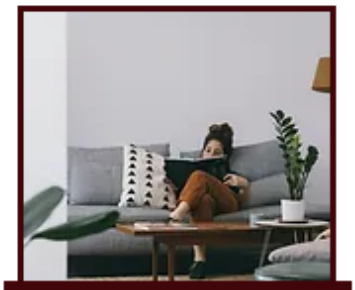
Learn More



Managing Stress

For resources about maintaining positive mental health in stressful environments

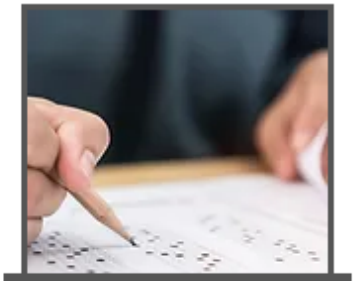
Learn More



Well-Being

For resources on enhancing our well-being in high stress moments

Learn More



Enhancing Performance

For resources on managing academic expectations and enhancing your performance

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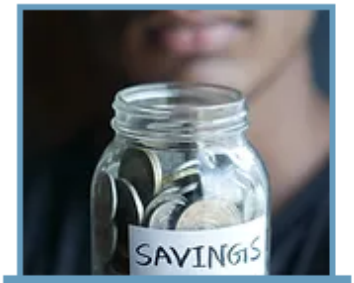

Adulting

For resources on coping with new responsibilities as an adult

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Socializing

For some resources about creating and maintaining social connections during university

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In pages above, you will find strategies and resources in many different formats:

The brief videos cover topics such as stress & coping, motivation, performance & expectations and all present simple strategies to build resilience and cope effectively as a university student. Videos do not exceed 8 minutes in duration and can be watched in any order that works best for you.

The infographics provide information, strategies, and weblinks around various stress management techniques for all six mental health resilience areas.

The quick practices present some on the go, easy to use resilience building strategies to cope with everyday stressors.
These practices can be used anywhere and anytime.

RESOURCES FOR FORMAL SUPPORT

Sometimes use of self-directed mental health resources **may not be sufficient**, especially during times of very high stress and low coping capacity. During these times, **more formal support might be needed**.

Formal support usually involves **speaking with a trained professional** (e.g., helplines, peer support, group workshops, counselling).

Remember: seeking help from McGill is confidential and will not be on your academic record.

Here are more formal supports available to you right now:

Contact the McGill Wellness hub, a health and wellness service for McGill students.

Contact your Local Wellness Advisor (LWA).
LWA'S are trained clinicians embedded within different faculties at McGill. Local wellness advisors can help you create your personalized wellness plan. Make an appointment today.

Try out Keep Me Safe, an application that provides free, 24/7 access to mental health support for McGill students. Key features include access to licensed professional clinicians, in-person counselling sessions, and short wait times.

Download the MySSP app for Apple iOS or Android, and visit the SSMU website to learn more about accessing this service.

Contact Kids Help Phone, a free, 24/7, crisis text and phone service available to anyone 18-29 years old.

Contact Info-Social, a free, 24/7 telephone consultation service with a psychosocial worker.

Check out the resources page on our website for some more services!

TIPS FOR SEEKING SUPPORT

We acknowledge that it can be difficult to take the first step to seek support, and there might be many myths surrounding help-seeking. Below are a few quick notes to keep in mind:

Experiences of seeking support can be different for everyone.
Remember that a negative experience for a friend does not mean that you will also have the same experience.

When reaching out, it is important to be very clear and open about what has led you to seek support. Here are some quick tips:

- Remember to be specific about your situation and why you are seeking help **now**.
- You may consider mentioning what coping strategies you have **already** tried, and why they may **not be working for you now.**
- Be clear that you have **no other way to get support at this moment.**

Note: If you or someone else needs emergency health care or you are at risk of harming yourself or others, please call 911.
If you or another McGill community member is in danger and you are at the downtown campus, you can call Campus Security at 514-398-3000 If you are at the Macdonald campus, you can call 514-398-7777.
If you would like to consult a nurse or social worker, please call **811**.

Study 3: Acceptability Ratings among the Directed Group

Table 1d

Participant ratings of acceptability (satisfaction, actual and planned strategy use, impact on well-being) among those in the directed group (n = 72).

	Group 1: Directed (N = 72)											
	Time 1				Time 2				Time 3			
	Strongly disagree	Disagree	Agree	Strongly agree	Strongly disagree	Disagree	Agree	Strongly agree	Strongly disagree	Disagree	Agree	Strongly agree
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
1. I found the website useful for me	4 (6.1)	13 (19.7)	43 (65.2)	6 (9.1)	2 (2.9)	16 (22.9)	51 (72.9)	1 (1.4)	6 (8.5)	11 (15.5)	50 (70.4)	4 (5.6)
2. I found the content in the website was presented in an engaging manner	4 (6.1)	10 (15.2)	35 (53.0)	17 (25.8)	3 (4.3)	15 (21.4)	40 (57.1)	12 (17.1)	2 (2.8)	10 (14.1)	45 (63.4)	14 (19.7)
3. I found that the website presented valuable strategies and techniques	1 (1.5)	5 (7.7)	42 (64.6)	17 (26.2)	1 (1.4)	4 (5.7)	51 (72.9)	14 (20.0)	2 (2.8)	5 (7.0)	48 (67.6)	16 (22.5)
4. I would recommend this website to other university students	2 (3.0)	12 (18.2)	33 (50.0)	19 (28.8)	2 (2.9)	10 (14.3)	37 (52.9)	21 (30.0)	3 (4.2)	8 (11.3)	38 (53.5)	22 (31.0)
5. The strategies presented in the website helped me better understand how to manage my stress and improve my wellness	1 (1.5)	18 (27.3)	38 (57.6)	9 (13.6)	2 (2.9)	14 (20.0)	51 (72.9)	3 (4.3)	2 (2.8)	10 (14.1)	45 (63.4)	14 (19.7)
6. The strategies presented in the website were easy to understand	3 (4.5)	2 (3.0)	41 (62.1)	20 (30.3)	1 (1.4)	6 (8.7)	39 (56.5)	23 (33.3)	0 (0)	5 (7.0)	38 (53.5)	28 (39.4)
7. I feel confident in my understanding of the suggested strategies on the website	4 (6.1)	4 (6.1)	37 (56.1)	21 (31.8)	1 (1.4)	3 (4.3)	45 (65.2)	20 (29.0)	0 (0)	6 (8.5)	42 (59.2)	23 (32.4)
8. The website has motivated me to try out these strategies	6 (9.1)	19 (28.8)	33 (50.0)	8 (12.1)	3 (4.3)	21 (30.0)	38 (54.3)	8 (11.4)	5 (7.1)	12 (17.1)	40 (57.1)	13 (18.6)
	Never	Sometimes	Frequently	Everyday	Never	Sometimes	Frequently	Everyday	Never	Sometimes	Frequently	Everyday
Over the past two weeks, how often did you use the strategies presented on the website?	11 (16.7)	49 (74.2)	6 (9.1)	0 (0)	11 (15.7)	50 (71.4)	9 (12.9)	0 (0)	11 (15.5)	45 (63.4)	13 (18.3)	2 (2.8)
Over the coming weeks, I plan to use the strategies presented on the website	4 (6.1)	41 (62.1)	20 (30.3)	1 (1.5)	2 (2.9)	41 (59.4)	20 (29.0)	6 (8.7)	7 (9.9)	41 (57.7)	20 (28.2)	3 (4.2)
	No impact	Low impact	Somewhat impacted	Highly impacted	No impact	Low impact	Somewhat impacted	Highly impacted	No impact	Low impact	Somewhat impacted	Highly impacted
Over the past two weeks, how would you rate the impact of the strategies presented on the website on your well-being?	10 (15.2)	19 (28.8)	33 (50.0)	4 (6.1)	8 (11.4)	18 (25.7)	40 (57.1)	4 (5.7)	9 (12.7)	10 (14.1)	46 (64.8)	6 (8.5)

Note. Different *n* between timepoints is a result of participant attrition over time.

Study 3: Acceptability Ratings among the Non-Directed Group

Table 1e

Participant ratings of acceptability (satisfaction, actual and planned strategy use, impact on well-being) among those in the non-directed group (n = 66).

	Group 2: Non-directed (N = 66)											
	Time 1				Time 2				Time 3			
	Strongly disagree	Disagree	Agree	Strongly agree	Strongly disagree	Disagree	Agree	Strongly agree	Strongly disagree	Disagree	Agree	Strongly agree
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
1. I found the website useful for me	0 (0)	10 (16.9)	46 (78.0)	3 (5.1)	1 (1.6)	13 (21.3)	46 (75.4)	1 (1.6)	2 (3.1)	12 (18.8)	46 (71.9)	4 (6.3)
2. I found the content in the website was presented in an engaging manner	0 (0)	10 (16.9)	40 (67.8)	9 (15.3)	2 (3.3)	9 (14.8)	45 (73.8)	5 (8.2)	2 (3.1)	7 (10.9)	46 (71.9)	9 (14.1)
3. I found that the website presented valuable strategies and techniques	0 (0)	5 (8.5)	45 (76.3)	9 (15.3)	0 (0)	2 (3.3)	50 (82.0)	9 (14.8)	1 (1.6)	4 (6.3)	49 (76.6)	10 (15.6)
4. I would recommend this website to other university students	1 (1.7)	10 (16.9)	38 (64.4)	10 (16.9)	0 (0)	10 (16.4)	34 (55.7)	17 (27.9)	1 (1.6)	7 (10.9)	37 (57.8)	19 (29.7)
5. The strategies presented in the website helped me better understand how to manage my stress and improve my wellness	1 (1.7)	10 (16.9)	40 (67.8)	8 (13.6)	1 (1.6)	9 (14.8)	43 (70.5)	8 (13.1)	2 (3.2)	11 (17.5)	39 (61.9)	11 (17.5)
6. The strategies presented in the website were easy to understand	1 (1.7)	3 (5.1)	38 (64.4)	17 (28.8)	0 (0)	7 (11.5)	38 (62.3)	16 (26.2)	1 (1.6)	3 (4.7)	39 (60.9)	21 (32.8)
7. I feel confident in my understanding of the suggested strategies on the website	0 (0)	11 (18.6)	36 (61.0)	12 (20.3)	0 (0)	7 (11.5)	44 (72.1)	10 (16.4)	1 (1.6)	10 (15.6)	41 (64.1)	12 (18.8)
8. The website has motivated me to try out these strategies	0 (0)	16 (27.6)	36 (62.1)	6 (10.3)	3 (5.0)	16 (26.7)	34 (56.7)	7 (11.7)	2 (3.1)	19 (29.7)	32 (50.0)	11 (17.2)
	Never	Sometimes	Frequently	Everyday	Never	Sometimes	Frequently	Everyday	Never	Sometimes	Frequently	Everyday
Over the past two weeks, how often did you use the strategies presented on the website?	8 (13.6)	45 (76.3)	6 (10.2)	0 (0)	10 (16.7)	43 (71.7)	7 (11.7)	0 (0)	7 (10.9)	47 (73.4)	10 (15.6)	0 (0)
Over the coming weeks, I plan to use the strategies presented on the website	2 (3.4)	34 (57.6)	20 (33.9)	3 (5.1)	2 (3.0)	36 (59.0)	22 (36.1)	1 (1.6)	4 (6.3)	40 (62.5)	18 (28.1)	2 (3.1)
	No impact	Low impact	Somewhat impacted	Highly impacted	No impact	Low impact	Somewhat impacted	Highly impacted	No impact	Low impact	Somewhat impacted	Highly impacted
Over the past two weeks, how would you rate the impact of the strategies presented on the website on your well-being?	8 (13.6)	21 (35.6)	29 (49.2)	1 (1.7)	9 (14.8)	16 (26.2)	34 (55.7)	2 (3.3)	7 (10.9)	18 (28.1)	37 (57.8)	2 (3.1)

Note. Different *n* between timepoints is a result of participant attrition over time.

Study 3: Correlations of Study Variables

Table 1f

Longitudinal Correlations Between the Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PSS T1	-														
2. CSE T1	-.516***	-													
3. CIh T1	-.225**	.547***	-												
4. CIUh T1	.443***	-.431***	-.184*	-											
5. WB T1	-.630***	.673***	.424***	-.406***	-										
6. PSS T2	.641***	-.359***	-.132**	.364***	-.450***	-									
7. CSE T2	-.397**	.682***	.307***	-.350***	.558***	-.495***	-								
8. CIh T2	-.198**	.454***	.633***	-.137**	.407***	-.246***	.441***	-							
9. CIUh T2	.371***	-.390***	-.151*	.645***	-.320***	.406***	-.500***	-.172*	-						
10. WB T2	-.553***	.564***	.260***	-.446***	.741***	-.678***	.720***	.436***	-.479***	-					
11. PSS T3	.551***	-.328***	-.176*	.352***	-.427***	.713***	-.470***	-.264***	.422***	-.560***	-				
12. CSE T3	-.306***	.630***	.367***	-.256***	.448***	-.379***	.750***	.428***	-.428***	.540***	-.522***	-			
13. CIh T3	-.134**	.441***	.628***	-.130**	.347***	-.162*	.427***	.690***	-.126**	.298***	-.262***	.518***	-		
14. CIUh T3	.290***	-.225**	-.041	.508***	-.235**	.345***	-.397***	-.071	.667***	-.395***	.452***	-.380***	-.012	-	
15. WB T3	-.464***	.460***	.289***	-.318***	.671***	-.559***	.600***	.362***	-.386***	.759***	-.701***	.661***	-.386***	-.395***	-

Note. PSS = Perceived Stress Scale; CSE = Coping Self-Efficacy; Cih = Coping Index Healthy Coping; CIUh = Coping Index Unhealthy Coping; WB = Well-being. Correlations shown for the subsample of participants used across main analyses (n = 177). ***p < .001.**p <.01.*p < .05.