The Post-Secondary Student Stressors Index (PSSI): Proof of Concept and Implications for Use

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Abstract

Objective: This study demonstrates the utility of the Post-Secondary Student Stressors Index (PSSI), an instrument designed to identify and evaluate the sources of student stress. The PSSI is comprised of 46 stressors, rated by severity and frequency, across five domains: academics, learning environment, campus culture, interpersonal, and personal.

Participants: Pilot testing of the tool was conducted among $n = 535$ post-secondary students enrolled at an Ontario university.

Methods: Mean severity and frequency ratings were calculated for each stressor on the instrument. Results were plotted, stratifying results by sex. T-tests for differences in means across sexes were calculated for each stressor.

Results: Female students in this sample consistently rated nearly all stressors on the instrument as more severe than their male counterparts. Females also reported higher frequency ratings on average, indicating that they worried more often about stressors than males. Domain-specific stressors are discussed.

Conclusions: The PSSI can provide post-secondary institutions with the ability to target and improve their mental health promotion and mental illness prevention efforts.

Keywords: post-secondary; student; mental health; stress; health promotion

Background

In recent years, chronic stress and poor mental health among students have become major concerns for post-secondary institutions across Canada [1,2] and elsewhere [3–5]. Excessive stress among students has been linked to numerous negative outcomes, including poor mental health [6] and interference with academic performance [7]. The 2016 iteration of the National College Health Assessment II (NCHA II) survey revealed excessive stress and symptoms consistent with common mental illnesses among Canadian post-secondary students, with the crude prevalence estimates for self-reported symptoms of past-year anxiety and depression increasing between the 2013 and 2016 iterations of the survey [7,8]. Evidence of severe distress, including self-harm (8.7%), suicidal ideation (13%), and previous suicide attempts (2.1%), were also prominent, sparking significant concern about the wellbeing of this population.

While large-scale efforts to monitor the prevalence of mental health problems among post-secondary students are available (e.g., the NCHA II survey) or are in development (e.g., the Canadian Campus Wellbeing Survey, currently in development at the University of British Columbia [9]), each comes with their own limitations. For example, the NCHA II survey was designed primarily to evaluate physical health characteristics and behaviours. As a result, the mental health measures included on the survey are limited and have been met with strong criticisms [10]. While students are asked to share the overall level of stress they have experienced within the past 12-month period, as well as the degree to which stress has impacted their academic performance, more specific questions regarding the sources of this stress are notably absent. The NCHA II does touch upon some common sources of stress with a series of questions inquiring about factors affecting academic performance (e.g., work, roommate difficulties, health concerns, injury, etc.) but these are not always specific to the student experience. Additionally, the decision to place each of these factors only in context of how they have impacted a student's academic performance is problematic, given that previous research has shown some of the highest-performing students that exhibit characteristics such as perfectionism to be the most at risk for chronic stress and mental health-related challenges [11–13]. In contrast, the Canadian Campus Wellbeing Survey fills some of the gaps left by the NCHA II by focusing exclusively on student mental health and wellbeing. However, stress remains only one component of the relatively large subject area of "wellbeing", and as such, is not as comprehensive an assessment as institutions may be need to make informed decisions regarding the tailoring of their mental health promotion and mental illness prevention programming on campus based on the stressors students experience.

The Post-Secondary Student Stressors Index is not the first instrument designed to evaluate the sources of post-secondary student stress, with several instruments having been created in the 1990's and early 2000's to address this area of inquiry [14–16]. However, in addition to being outdated, many of these instruments are associated with a number of issues that preclude them from being useful, including

scope-related issues, poor psychometric properties, and evaluation of only one dimension of stress (e.g., most frequently only severity of stress). The PSSI was designed to fill the gaps left by its predecessors.

The PSSI includes stressors from across multiple domains of the student experience, including: academics, the learning environment, campus culture, the interpersonal, and the personal. The instrument was developed using an explanatory sequential mixed methods research design conducted over a two-year period, placing emphasis on a "for-students-by-students" approach. Students were actively engaged in the development, refinement, and testing of the tool, and treated as subject matter experts. Using a combination of qualitative and quantitative methods, the authors sought to not only identify a holistic list of the sources of student stress, but also to understand the reasons why these things prompted a stress reaction in students [17]. The ability to more accurately identify the sources of student stress is the first step towards helping post-secondary institutions to develop efficacious mental health promotion and mental illness prevention efforts and maximize their effectiveness for their student body.

Objectives

The objectives of this study were: 1) to present proof-of-concept, demonstrating the utility of the PSSI; and 2) to offer recommendations for the future use of the tool. We conducted a sex-based analysis of stressors, to observe whether male and female students' experiences of stress differed within the post-secondary setting. The findings presented in this paper lead to recommendations applicable to this student body (e.g., how services might be targeted given the data observed), and serve as a guideline for other institutions that may be interested in utilizing the PSSI.

Methods

Sample and Participants

The data presented here were collected from a sample of students at a mid-sized Ontario university that was also used to facilitate the collection of evidence for validity. A random sample of 5000 students was provided by the Office of Institutional Research and Planning. All enrolled students were eligible to participate, with no exclusion criteria applied. A total of 535 participants completed the survey, representing a response rate of 11%. Although low, this is somewhat typical of response rates for student surveys, and sufficient for our purposes here. All participants consented to participate in the online survey. This research received ethics clearance from the institutional ethics board.

Measures

Post-Secondary Student Stressors Index

The PSSI is comprised of 46 stressors across five major domains of stress: academics, the learning environment, campus culture, the interpersonal, and the personal. Students are asked to indicate the

severity of stress they experience ("How stressful is this?") for each item on the instrument, as well as the frequency with which this stress occurs ("How often are you stressed about this?"). Response options ranged from a scale of 1 ('not stressful' and 'rarely') to 4 ('very stressful' and 'almost always'), with an additional option to indicate N/A in the event that a stressor was not applicable. The PSSI has been evaluated for preliminary validity and reliability, demonstrating strong psychometric properties[18].

Demographics

In addition to the PSSI, participants were asked to provide demographic information, including: sex, year of birth, relationship status, living arrangement during the academic year, level of study, student status, estimated grade point average, and whether or not they were an international student.

Analysis

Descriptive statistics were calculated for the demographic characteristics of the sample. We calculated the mean severity and mean frequency for each stressor on the instrument, identifying the top stressors in each domain. If a participant indicated either that they did not consider an item to be stressful or that the item never happened to them (and by extension, rated frequency as not applicable), they were not included in these mean scores. The proportion of people included in the averages on this basis can be observed in Appendix A, Table A-1. Mean scores were plotted for both male and female students on two-by-two plots, stratified by severity and frequency. This visual display facilitates easy observation of the priority areas for each domain of stress (e.g., those that are above average in both severity and frequency). Plots were developed for each domain of stress, as well as one larger, overall plot depicting all stressors measured by the PSSI. Finally, t-tests for differences in means across sexes were conducted for both severity and frequency scores for each stressor (reported in Appendix B, Table B-1).

Results

Demographics

Demographic characteristics of the sample are reported in Table 1. Most participants were female (74.0%), single (64.9%), lived off campus with roommates (62.1%), self-reported their GPA to be between 80-89% (41.7%), and studied full-time (92.1%) and at the undergraduate level (65.5%). The majority of participants were between the ages of 19 and 21 years (63.7%), with an overall average age of 24.5 years (*SD*= 7.0). International students made up about 9% of the sample.

Table 1. Demographic Characteristics of Sample (n = 535)

Variable	Frequency *n*	Percent *%*
Sex		
Female	396	74.0
Male	132	24.7
Non-Binary	3	0.6
Prefer not to answer	4	0.7
Age Group		
18-21 years	264	49.3
22-25 years	130	24.3
26-29 years	65	12.1
30+ years	76	14.2
Relationship Status		
Single	347	64.9
In a Relationship	111	20.7
Married or Common-law	68	12.7
Separated, Divorced, or Widowed	2	0.3
Prefer not to answer	7	1.3
Living Arrangement		
Campus residence hall	35	6.4
Other on-campus housing	13	2.4
Off campus with roommates	332	62.1
Off campus alone	69	12.9
Off campus with family	83	15.5
Prefer not to answer	3	0.6
Level of Study		
1st - 2nd year Undergraduate	187	34.9
3rd - 5th year Undergraduate	154	28.8
Graduate (Masters)	72	13.5
Graduate (Doctoral)	53	9.9
Professional Program	47	8.8
Other	21	3.9
Prefer not to answer	1	0.2
Student Status		
Full-time	493	92.1
Part-time	32	6.0
Other[a]	8	1.5
Prefer not to answer	2	0.4
International Student		
No	486	90.8
Yes	48	9.0
Prefer not to answer	1	0.2
Approximate GPA		
90-100%	103	19.3
80-89%	223	41.7
70-79%	147	27.5
60-69%	32	6.0
0-59%	4	0.7
Prefer not to answer	26	4.9

Note. Valid percents reported.

[a] "Other" category includes non-degree seekers, online students, medical residents.

Overall Results

First, we observed the mean severity and frequency ratings for stressors within each domain. Academic stressors consistently ranked among the most severe stressors, but the frequency with which they were experienced varied. Certain stressors (such as thesis projects, practicums, and meetings with advisors) were rated as severe, but reported by fewer students. This is to be expected, given the relatively smaller proportion of students in the sample to whom these stressors were likely to apply (e.g., graduate students, students in professional programs). Stressors within the learning environment were generally rated as infrequent and less severe. Among stressors related to campus culture, a range of frequency and severity ratings were observed. Sexual harassment was reported infrequently, even among those reporting it ever, but was rated as severely stressful when it did occur. Interpersonal stressors included the stressor reported to occur most frequently across the entire sample: pressure to own expectations. All stressors in the personal category were rated above average in frequency, but severity scores ranged from among the lowest (health-related stressors such as cooking, exercise, nutrition, and sleep) to among the highest (financial pressures, including having to take student loans, and worrying about getting a job after graduation). Figure 1 depicts the mean severity and frequency ratings for all stressors included in the instrument.

Figure 1. Mean severity and frequency ratings for all stressors PSSI (total sample)

Sex-Based Analysis
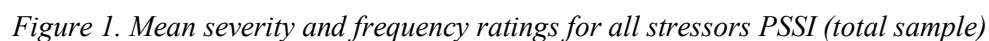
Within each domain of stress, the mean severity and frequency scores for stressors were plotted against each other for male (blue) and female (red) participants (Figures 1-5). A dotted line connects the male and female scores for each stressor. The size of the point is proportional to the number of participants who were affected by the stressor, with larger points reflecting higher frequencies. The axes on the plot

represent the overall mean severity and frequency for all stressors in the domain of interest (excluding those who rated severity as 0 [not applicable] or 1 [not stressful]), as rated by the entire sample. T-tests were conducted to assess whether the severity and frequency scores reported by male and female students were significantly different for each stressor (see Appendix B).

Overall, female students' most severe stressors were having multiple exams in the same week, writing heavily weighted exams (i.e., worth 50%+ of final course grade), worrying about getting into a new program, taking loans, incurring debt, and meeting their own expectations. Their most frequent stressors were meeting their own expectations, pressure to succeed, debt, loans, and having multiple assignments to complete simultaneously. The most commonly reported stressors by female students were multiple assignments (96%), heavy workload (93%), and meeting their own expectations (92%), while their least frequently reported were working on thesis (28%), and lack of mentoring from supervisor (28%), and meeting supervisor's expectations (30%). Male students' most severe stressors were having multiple exams, worrying about getting a job, having multiple assignments due at the same time, sexual harassment on campus, and meeting their own expectations. Their most frequent stressors were meeting their own expectations, worrying about getting a job, worrying about not work hard enough, worrying about getting into a new program, and maintaining a high GPA. The most commonly reported were meeting their own expectations (89%), multiple assignments (89%), and pressure to succeed (84%). The least commonly reported were sexual harassment (12%), discrimination (27%), and lack of mentoring from supervisor (28%).
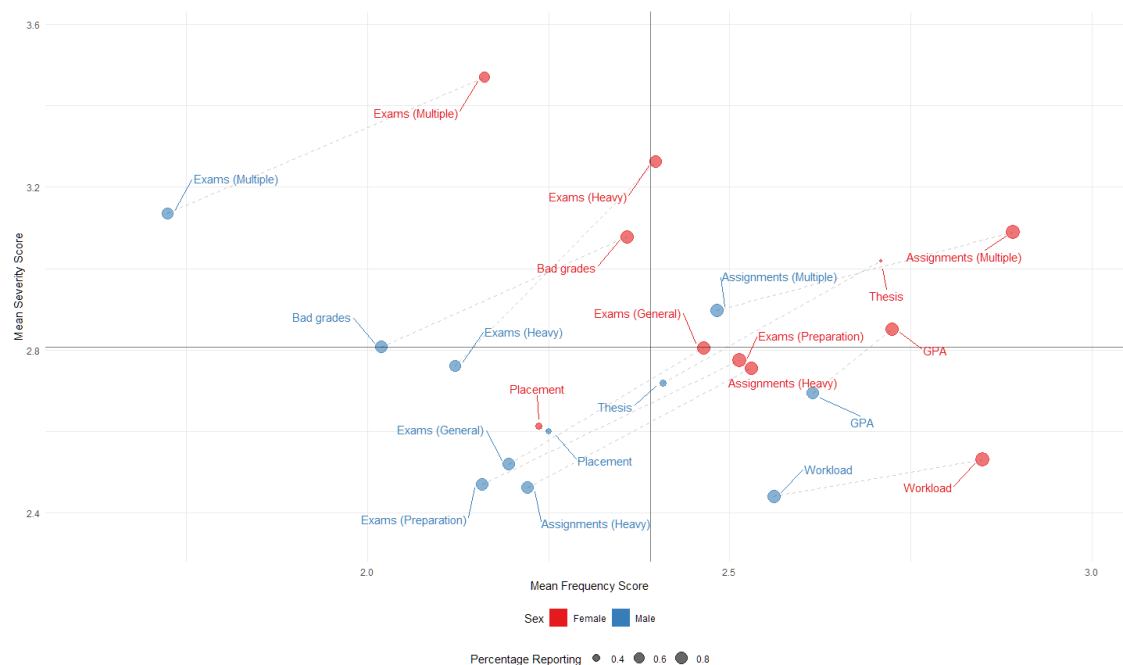

Figure 2. Mean severity and frequency ratings for academic stressors, by sex

Academic Domain

On average, female (F) students reported academic stressors to be more severe and more frequent than did male (M) students, suggesting that female students more often worry about academic stressors than male students. The largest absolute differences in mean severity by sex were observed for: exams worth 50% or more (F +0.50%), having multiple exams in one week (F +0.33%), preparing for exams (F +0.30%), and working on thesis (F +0.30%). By mean frequency, the largest differences were observed for: having multiple exams in one week (F +0.44%), having multiple assignments due around the same time (F +0.41%), and preparing for exams (F +0.35%), and receiving a bad grade (+0.34%). The smallest difference for both mean severity and frequency ratings between sexes was observed for performing well at placement (F +0.01%, -0.01%). Significant mean differences by sex for both severity and frequency were observed for nearly all stressors in this domain, with the exceptions of managing academic workload, maintaining GPA, and performing well at placement.
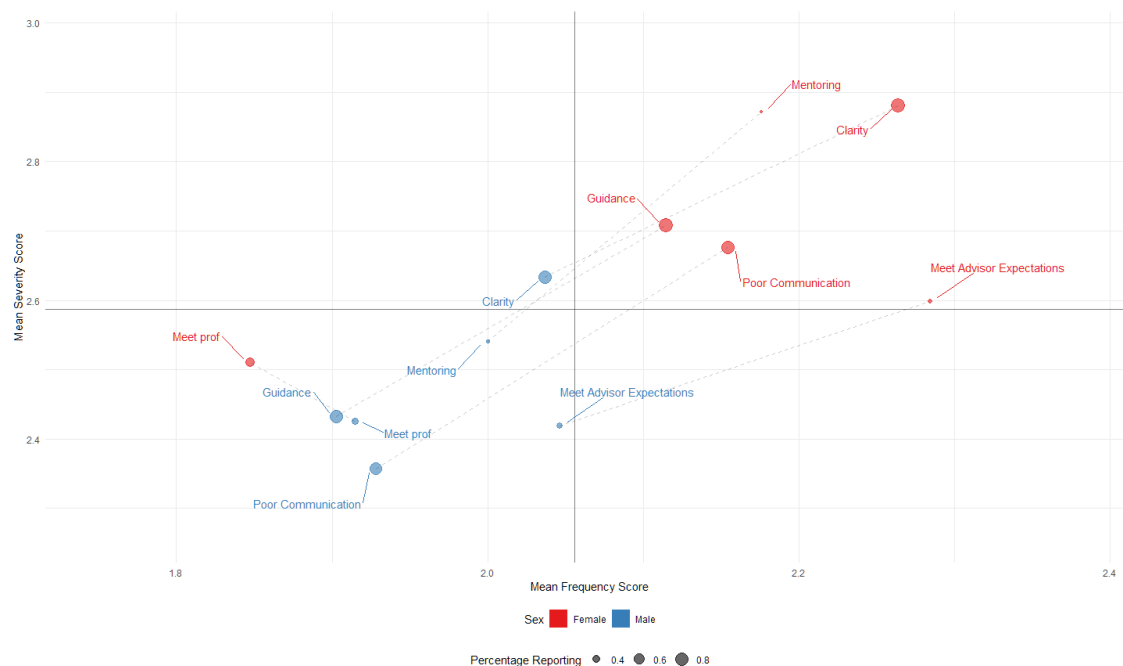

Figure 3. Mean severity and frequency ratings for learning environment, by sex

Learning Environment Domain

Female students generally reported stressors within the learning environment to be more severe and more frequently occurring than their male counterparts. The largest absolute differences in mean severity by sex were observed for: lack of mentoring from supervisor (F +0.33%), poor communication from professor (F +0.32%), and lack of guidance from professor (F +0.28%). For frequency, the largest differences were for: meeting advisor's expectations (F +0.23%), poor communication from professor (F +0.22%), lack of clarity from professor (F +0.22%), and lack of guidance from professor (F +0.21%). The smallest difference for both severity and frequency was reported for meeting with professor, with female students reporting the average severity to be slightly higher (+0.08%) compared to male

students, but the average frequency to be slightly lower (-0.06%). Significant differences in both mean severity and frequency were observed across sexes for poor communication, lack of clarity, and lack of guidance, with a significant difference in mean severity also observed across sexes for lack of mentoring from advisor.
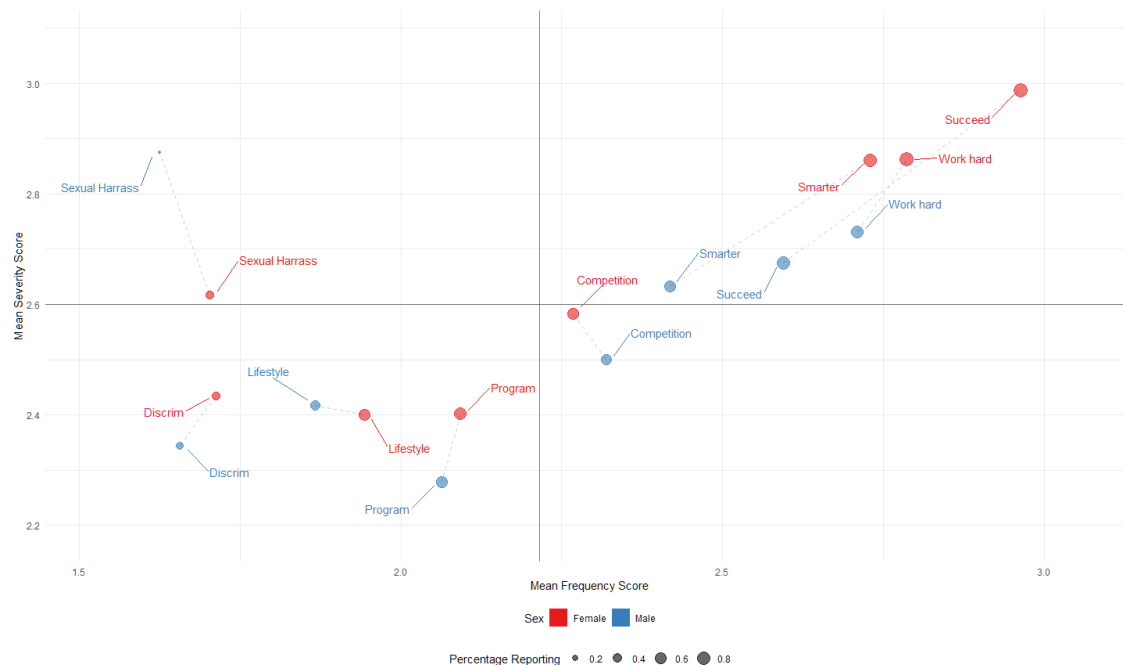

Figure 4. Mean severity and frequency ratings for campus culture, by sex

Campus Culture Domain

Results for stressors within the campus culture domain were variable. In general, female students tended to report these stressors as being more severe compared to male students, with the exception of sexual harassment on campus. While a larger proportion of female students reported sexual harassment on campus (32% compared to 12% of males), the average severity rating provided by female students for this stressor was lower than that provided by their male counterparts (F -0.26%), despite females reporting this stressor more frequently (F +0.08%). The largest absolute differences in mean severity by sex were observed for: pressure to succeed (F +0.31%), sexual harassment on campus (M +0.26%), and feeling like my peers are smarter than I am (F +0.23%). By frequency, the largest differences were observed for: pressure to succeed (F +0.37%) and feeling like my peers are smarter than I am (F +0.31%). The smallest difference in severity was observed for adjusting to the post-secondary lifestyle, with female students' rating this stressor as slightly less severe than male students (F -0.02%), while the smallest difference in frequency was observed for adjusting to a new program (F +0.03%). Only two statistically significant differences in mean severity and frequency were observed across sexes in this domain: feeling like my peers are smarter than I am, and pressure to succeed.
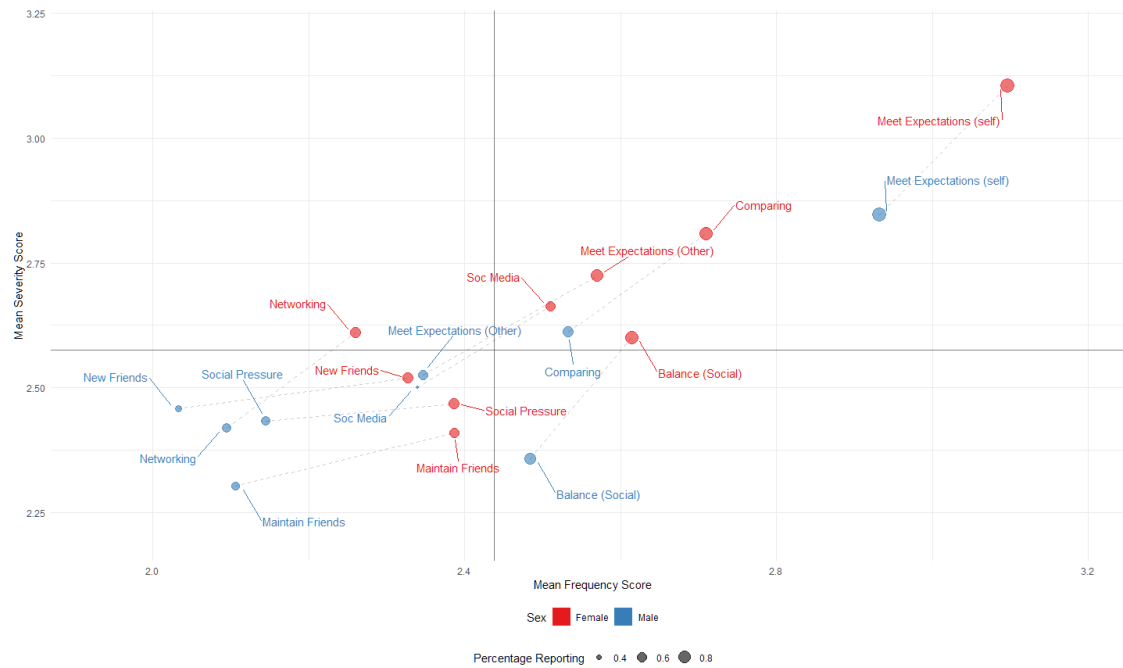
Figure 5. Mean severity and frequency ratings for interpersonal stressors, by sex

Interpersonal Domain

Female students consistently reported interpersonal stressors as being more severe compared to male students, with the largest absolute differences in mean severity by sex observed for: meeting own expectations (F +0.25%), balancing social life with academics (F +0.24%), networking (F +0.19%), and meeting others' expectations (F +0.19%). For frequency, the largest differences were observed for: making new friends (F +0.30%), maintaining friendships (F +0.28%), pressure to socialize (F +0.28%), and meeting others' expectations (F +0.22%). The smallest difference in severity was observed for pressure to socialize (F +0.04%), while the smallest difference in frequency was observed for balancing a social life with academics (F +0.13%). Significant differences in mean severity across sexes were observed for networking, balancing social life with academics, comparing myself to others, and meeting expectations (both others' and self). Significant differences in mean frequency across sexes were observed for making new friends, maintaining friendships, pressure to socialize, and meeting others' expectations.
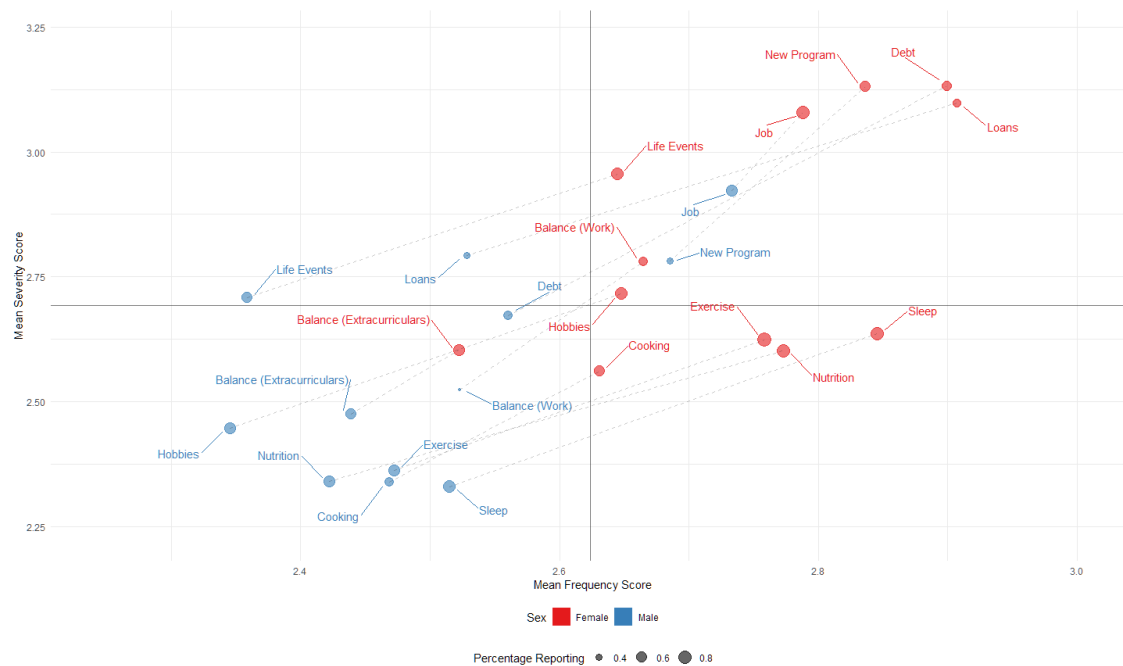
Figure 6. Mean severity and frequency ratings for personal stressors, by sex

Personal Domain

Female students consistently reported personal stressors as being more severe and more frequent in occurrence than their male counterparts. The largest absolute differences in mean severity by sex were observed for: debt (F +0.46%), worrying about getting into a new program (F +0.35%), having to take student loans (F +0.31%), and getting enough sleep (F +0.31%). For frequency, the largest differences were observed for: loans (F +0.38%), nutrition (F +0.35%), and debt (F +0.34%). The smallest difference in mean severity was observed for balancing extracurriculars with academics (F +0.12%), while the smallest difference in mean frequency was observed for worrying about getting a job after graduation (F +0.06%). Significant mean differences in severity across sexes were observed for every stressor in this domain, with the exceptions of balancing extracurriculars with academics and worrying about getting a job. No significant differences in frequency across sexes were observed for cooking, balancing work with academics, balancing extracurriculars with academics, worrying about getting a job, or worrying about getting into a new program post-graduation.

Discussion

The purpose of developing the PSSI was to provide a better assessment of students' exposure to stressors within the post-secondary setting. In this paper, proof-of-concept for the utilization of the tool was demonstrated among a sample of students at a mid-sized university in Ontario. Female students in this sample consistently rated nearly all stressors on the instrument as more severe than their male counterparts. Females also reported higher frequency ratings on average, indicating that they worried more often about stressors than males. This is consistent with existing knowledge regarding female

students' tendency to self-report a higher degree of stress and distress than male students [7]. Results within each domain of stress are discussed below in context of existing literature.

With respect to academic stressors, female students consistently reported higher mean severity ratings by an average of about +0.30%, compared to male students. Female students also tended to report higher frequencies in this category, indicating that females worried about academic stressors more often than their male counterparts. Some of the most severe stressors for both sexes included managing multiple exams or assignments within a short time frame, while managing the academic workload was the most frequently reported stressor. Together, these findings suggest that that time management may be a key component of students' academic stress, consistent with previous literature. Indeed, previous research has found the management of academic demands to be one of the most commonly cited sources of stress for students [19–21]. One recommendation for this particular institution might be to provide students with the tools and education required to improve their ability to multitask as part of their mental health promotion activities. In addition, they may consider policy options that prevent multiple exams within a short time frame (e.g., no more than two exams in a five-day period).

Secondly, writing heavily weighted exams worth 50% or more was identified as the second most severe stressor for both sexes, and affected a large proportion of the sample. This is consistent with existing literature identifying test anxiety as a major academic stressor for many students [22]. Moving forward, the implementation of a policy restricting finals to a maximum weighting of 40% may be warranted. Recent discussions within the Scholarship of Teaching and Learning have begun to explore the utility of a paradigmatic shift in the assessment of student learning, moving away from standardized tests and examinations as a method of assessment towards more practical alternatives such as assignments and oral presentations [23]. It is possible that a shift away from exams as a primary method of assessment may have a positive impact on reducing student stress.

Within the learning environment domain, female students reported communication and clarity issues with faculty members as more severe and frequently stressful in comparison to male students. This may be linked to female students' comparatively greater concern for achieving academic excellence compared to males, as observed within the academic domain. Previous research has shown that constructive student-faculty interactions are connected to several positive outcomes for students, including feelings of belongingness on campus, positive academic self-concept, and positive psychosocial wellbeing, highlighting the importance of these interactions to students' overall wellbeing [24]. One exception to this rule was the item "meeting with professors," for which female students reported the lowest severity and frequency ratings. This might indicate that female students are more comfortable reaching out to professors for help than their male counterparts. This is in line with previous research which has found that females reach out to faculty members, particularly with requests about

coursework, more often than male students [24,25]. One policy change that might be explored at this institution is improved education and awareness for faculty and staff regarding the resources available to students who may be struggling with their coursework (e.g., student academic success services, writing centres). Additionally, many institutions offer brief courses through their Centres for Teaching and Learning that may be beneficial for faculty and staff in determining how to improve or clarify their curricula and expectations of students.

Findings in the campus culture category were mixed. Both males and females reported a desire to excel, with "pressure to succeed," "feeling like I'm not working heard enough," and "feeling like my peers are smarter than I am" leading the board in terms of both severity and frequency. Females rated pressure to succeed as being the most severe and frequent stressor in this domain, while males rated concerns about not working hard enough as having the greatest impact on their stress levels. Male students found competition with their peers to be more frequently stressful than females, tough females found this stressor to be slightly more severe. The severity of these stressors may reflect this particular institution's reputation as a high-achieving, research-based, top university in Canada. These stressors are frequently noted symptoms of "imposter syndrome," a condition where an individual feels they are fraudulent, or undeserving of their accomplishments and responsibilities, despite having earned them. Given the negative mental health effects imposter syndrome can produce, a possible recommendation might be to provide (or increase) education for students about imposter syndrome, and how to manage and/or combat it as a component of mental health promotion programming [26].

The identification of these stressors within the campus culture is consistent with previous literature that has highlighted the impact of environmental factors on students' overall wellbeing [27]. In fact, campus culture has been consistently linked to students' psychological health and wellbeing, with negative perceptions or experiences predicting less favourable health outcomes [28]. In particular, student experiences of racism, sexism, or other forms of discrimination and/or harassment have been linked to poor mental health outcomes [29,30]. Among this sample of students, experiences of sexual harassment and discrimination on campus were fairly rare, though rated as relatively severe when they did occur. Interestingly, male students reported sexual harassment to be both more severe and frequently occurring than female students. This may be explained by the wording of the item ("sexual harassment on campus") which was made intentionally general so as to not only invite responses from individuals who had experienced (or been a victim of) sexual harassment, but also those who witnessed it occurring on campus. Institutions should continue to enforce a no-tolerance policy regarding instances of sexual harassment and discrimination, in addition to continuing to educate students about campus resources available to them following these experiences.

The majority of the stressors within the interpersonal domain were rated similarly in terms of severity and frequency, with females' ratings slightly higher. Male students rated pressure to socialize as being a more frequent stressor than females. This is consistent with what male students shared during the development phase of research for the PSSI [17] as well as with existing literature regarding the pressure male students feel to meet the social expectations of what it means to be a male university or college student (e.g., often in the context of alcohol consumption and "partying") [31,32]. Despite pressure to socialize being a salient stressor for male students, making new friends and maintaining friendships were rated as less severe and less frequently stressful in comparison. One study found that the most frequent presenting issues for Canadian post-secondary students seeking counselling revolved around relationship concerns [19]. Perhaps additional mental health promotion programming that focuses on relationship management should be made available to students, particularly to those who may be more vulnerable to these stressors (e.g., first-year undergraduates).

Female students tended to rate social media as more severe and frequently stressful than male students. Though there has been little exploration into the impact of social media on post-secondary students' mental health and wellbeing to date, research among younger, adolescent populations suggests that this may be an important issue for incoming cohorts of students over the next several years. The most substantial stressor in this domain for both males and females was "meeting my own expectations," with both males and females rating this stressor well above average severity, and females rating it both more severe and frequently occurring than males. It is possible that the pressures produced by social media's frequent outward displays of perfectly "tailored" lives are contributing towards students placing pressure on themselves to meet unattainable expectations. Institutions should explore whether introducing education around healthy online (e.g., social media) habits into their mental health promotion programming may mitigate these stressors.

Within the personal domain, financial concerns were the most substantial stressors for female students, including incurring debt, having to take student loans, and worrying about getting a job after graduation. Male students also reported that worrying about getting a job was a relatively severe stressor (albeit, slightly less severe than females), but concerns regarding debt and loans were much lower by both severity and frequency. Financial concerns have long been acknowledged in the literature as a primary source of stress among student populations [33,34]. This suggests a need for institutions' health promotion programming to include financial literacy resources for students. Female students also tended to report health-related stressors (e.g., exercise, nutrition, getting enough sleep) as being more severe and frequent than male students. Previous research has found that healthful behaviours, such as getting enough sleep, engaging in regular physical activity, and eating a balanced diet have been linked to reductions in stress [35] and improved wellbeing [36]. The largest difference between sexes in this domain was observed for worrying about reaching major life events, which is consistent with existing literature

on sex-based concerns about reaching milestones, such as marriage and having children, particularly among graduate students [37]. Institutions might consider refocusing their mental health promotion programming to encompass elements of both physical and mental health, given the evolving definition of mental health and "wellness" as encompassing both physical and mental health components [38,39].

Limitations

Despite its strengths, there are some limitations to this research. Our analysis was based on a moderately small sample of students at a single Ontario university, which is unlikely to be representative of Canada's broader post-secondary student population. We strongly recommend that institutions interested in using this tool to make policy changes to mental health services on campus make every effort to gather a representative sample of their student body to ensure that inferences drawn from the sample are valid. Secondly, while the PSSI has been shown to be valid among post-secondary students in Ontario, little is known about its generalizability to student populations in other regions of Canada, or other countries such as the United States of America. Future research involving the PSSI should include a multi-site validation assessment across multiple universities in varying regions of Canada. Until the validity of the tool is evaluated in other settings and among different populations, it should be used with caution.

Conclusions

The PSSI assesses 46 stressors across five major domains of stress specific to the post-secondary student experience: academics, the learning environment, campus culture, the interpersonal, and the personal. The PSSI's dual-evaluation of both the severity and frequency of stress facilitates an analysis that can provide institutions with a straightforward method of pinpointing the most severe and frequently occurring stressors on their campus. This knowledge will not only facilitate the identification of initial priority areas for improvement, but will also allow institutions to more effectively target their mental health promotion and mental illness prevention programming.

Contributor Notes
BL is a Postdoctoral Research Fellow with the Health Services and Policy Research Institute at Queen's University in Kingston, Ontario, Canada. RB is a PhD Candidate in the Department of Public Health Sciences. HS is a Professor in the Department of Public Health Sciences at Queen's University, and the Bell Canada Mental Health and Anti-Stigma Research Chair.

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Appendix A

Table A-1. Severity and Frequency Ratings for Each Stressor, by Proportion Reporting

Stressor ID	Female			Male		
	Severity	*Frequency*	*Percent*	*Severity*	*Frequency*	*Percent*
Academic Domain						
Exams (Prep)	2.77	2.51	0.92	2.47	2.16	0.77
Exams (General)	2.81	2.46	0.87	2.52	2.20	0.74
Exams (Multiple)	3.47	2.16	0.66	3.14	1.72	0.67
Exams (Heavy)	3.26	2.40	0.78	2.76	2.12	0.70
Assignments (Heavy)	2.75	2.53	0.91	2.46	2.22	0.80
Assignments (Multiple)	3.09	2.89	0.96	2.90	2.48	0.89
Workload	2.53	2.85	0.93	2.44	2.56	0.83
Bad grades	3.08	2.36	0.91	2.81	2.02	0.79
GPA	2.85	2.72	0.89	2.69	2.61	0.74
Thesis	3.02	2.71	0.28	2.72	2.41	0.38
Placement	2.61	2.24	0.38	2.60	2.25	0.34
Learning Environment Domain						
Poor Communication	2.68	2.15	0.80	2.36	1.93	0.74
Clarity	2.88	2.26	0.90	2.63	2.04	0.83
Guidance	2.71	2.11	0.86	2.43	1.90	0.79
Meet prof	2.51	1.85	0.50	2.43	1.91	0.36
Meet Advisor Expectations	2.60	2.28	0.30	2.42	2.05	0.33
Mentoring	2.87	2.18	0.28	2.54	2.00	0.28
Campus Culture Domain						
Lifestyle	2.40	1.94	0.62	2.42	1.87	0.45
Program	2.40	2.09	0.71	2.28	2.06	0.60
Competition	2.58	2.27	0.61	2.50	2.32	0.55
Work hard	2.86	2.79	0.88	2.73	2.71	0.76
Smarter	2.86	2.73	0.80	2.63	2.42	0.60
Succeed	2.99	2.96	0.92	2.68	2.59	0.84
Discrim	2.43	1.71	0.33	2.34	1.66	0.27
Sexual Harrass	2.62	1.70	0.32	2.88	1.62	0.12

Interpersonal Domain						
New Friends	2.52	2.33	0.64	2.46	2.03	0.46
Maintain Friends	2.41	2.39	0.59	2.30	2.11	0.50
Networking	2.61	2.26	0.67	2.42	2.09	0.56
Social Pressure	2.47	2.39	0.67	2.43	2.14	0.58
Balance (Social)	2.60	2.61	0.82	2.36	2.48	0.72
Comparing	2.81	2.71	0.83	2.61	2.53	0.68
Soc Media	2.66	2.51	0.62	2.50	2.34	0.38
Meet Expectations (Other)	2.72	2.57	0.78	2.53	2.35	0.59
Meet Expectations (self)	3.10	3.10	0.92	2.85	2.93	0.89
Personal Domain						
Sleep	2.64	2.85	0.81	2.33	2.52	0.76
Exercise	2.62	2.76	0.87	2.36	2.47	0.69
Nutrition	2.60	2.77	0.83	2.34	2.42	0.69
Cooking	2.56	2.63	0.64	2.34	2.47	0.49
Balance (Work)	2.78	2.66	0.49	2.52	2.52	0.33
Balance (Extracurriculars)	2.60	2.52	0.67	2.48	2.44	0.62
Hobbies	2.72	2.65	0.73	2.45	2.35	0.64
Loans	3.10	2.91	0.49	2.79	2.53	0.40
Debt	3.13	2.90	0.55	2.67	2.56	0.51
Job	3.08	2.79	0.83	2.92	2.73	0.69
New Program	3.13	2.84	0.62	2.78	2.69	0.42
Life Events	2.96	2.64	0.73	2.71	2.36	0.60

Note. Percents indicate the proportion of respondents who experienced each stressor, calculated as the number of respondents who indicated that a stressor was 'somewhat stressful,' 'very stressful,' or 'extremely stressful,' divided by the total number of respondents to that question. Those who responded 'not applicable' or 'not stressful' were considered to be unaffected by the stressor."

Appendix B

Table B-1. T-tests for Difference of Means, by Sex

Question	Severity			Frequency		
	t	p value		t	p value	
ACADEMICS						
Exams (Preparation)	-3.9891	0.0001	*	-3.7736	0.0002	*
Exams (General)	-3.4176	0.0008	*	-2.6712	0.0083	*
Exams (Multiple)	-3.4796	0.0007	*	-3.0951	0.0023	*
Exams (Heavy)	-5.4879	0.0000	*	-2.1035	0.0372	*
Assignments (Heavy)	-4.0822	0.0001	*	-3.4922	0.0006	*
Assignments (Multiple)	-2.6316	0.0091	*	-4.5774	0.0000	*
Workload	-1.3092	0.1921		-3.1674	0.0018	*
Bad grades	-3.1956	0.0017	*	-3.2538	0.0014	*
GPA	-1.8911	0.0604		-1.0252	0.3070	
Thesis	-2.5033	0.0138	*	-1.8026	0.0746	
Placement	-0.1028	0.9184		0.0783	0.9378	
LEARNING ENVIRONMENT						
Poor Communication	-4.6133	0.0000	*	-2.2786	0.0240	*
Clarity	-3.2458	0.0014	*	-2.4942	0.0135	*
Guidance	-3.8221	0.0002	*	-2.0459	0.0425	*
Meet prof	-0.7829	0.4361		0.4435	0.6587	
Meet Advisor Expectations	-1.5192	0.1322		-1.4445	0.1524	
Mentoring	-2.4098	0.0185	*	-0.9043	0.3694	
CAMPUS CULTURE						
Lifestyle	0.1813	0.8565		-0.6351	0.5270	
Program	-1.8928	0.0602		-0.2760	0.7830	
Competition	-0.8746	0.3835		0.4476	0.6552	
Work hard	-1.6070	0.1099		-0.8116	0.4181	
Smarter	-2.6744	0.0084	*	-2.8168	0.0056	*
Succeed	-3.7790	0.0002	*	-3.7462	0.0002	*
Discrim	-0.7471	0.4582		-0.2807	0.7801	
Sexual Harrass	1.2177	0.2388		-0.2409	0.8125	

INTERPERSONAL

New Friends	-0.6819	0.4968		-2.5096	0.0136	*
Maintain Friends	-1.3421	0.1821		-2.4064	0.0178	*
Networking	-2.5507	0.0117	*	-1.6675	0.0977	
Social Pressure	-0.4114	0.6814		-2.3033	0.0229	*
Balance (Social)	-3.4018	0.0008	*	-1.3656	0.1740	
Comparing	-2.3483	0.0201	*	-1.5512	0.1233	
Soc Media	-1.5186	0.1329		-1.1596	0.2500	
Meet Expectations (Other)	-2.2431	0.0266	*	-2.0647	0.0409	*
Meet Expectations (self)	-3.0798	0.0024	*	-1.8605	0.0643	

PERSONAL

Sleep	-4.1842	0.0000	*	-3.6029	0.0004	*
Exercise	-3.4650	0.0007	*	-2.7800	0.0062	*
Nutrition	-3.4256	0.0008	*	-3.2188	0.0016	*
Cooking	-2.5364	0.0124	*	-1.4885	0.1392	
Balance (Work)	-2.1550	0.0346	*	-1.0139	0.3141	
Balance (Extracurriculars)	-1.5535	0.1222		-0.8125	0.4178	
Hobbies	-3.3098	0.0012	*	-2.9504	0.0037	*
Loans	-2.5159	0.0137	*	-2.5047	0.0142	*
Debt	-4.4213	0.0000	*	-2.5159	0.0134	*
Job	-1.6464	0.1018		-0.4857	0.6279	
New Program	-2.8969	0.0049	*	-1.0921	0.2780	
Life Events	-2.4542	0.0154	*	-2.3037	0.0229	*

Appendix C

Stressors items were shortened into stressor IDs to facilitate a clear display on the plots throughout this article. A reference codebook follows, identifying the items the IDs represent.

Table C-1. PSSI Codebook

Stressor ID	PSSI Item
Academics	
Exams (Preparation)	Preparing for exams
Exams (General)	Writing exams
Exams (Multiple)	Writing multiple exams same day
Exams (Heavy)	Writing exams worth 50% or more
Assignments (Heavy)	Heavily weighted assignments
Assignments (Multiple)	Having multiple assignments due around the same time
Workload	Managing my academic workload
Bad grades	Receiving a bad grade
GPA	Maintaining a high GPA
Thesis	Working on my thesis
Placement	Performing well at my placement (i.e., practicum)
Learning Environment	
Poor Communication	Poor communication from professor
Clarity	Unclear expectations from professor
Guidance	Lack of guidance from professor
Meet prof	Meeting with professor
Meet Advisor Expectations	Meeting my supervisor's expectations (placement/thesis)
Mentoring	Lack of mentoring from my supervisor (placement/thesis)
Campus Culture	
Lifestyle	Adjusting to the post-secondary lifestyle
Program	Adjusting to my program
Competition	Academic competition among my peers
Work hard	Feeling like I'm not working hard enough
Smarter	Feeling like my peers are smarter than I am
Succeed	Pressure to succeed
Discrim	Discrimination on campus
Sexual Harrass	Sexual harassment on campus

Interpersonal

New Friends	Making new friends
Maintain Friends	Maintaining friendships
Networking	Networking with the 'right' people
Social Pressure	Feeling pressured to socialize
Balance (Social)	Balancing a social life with my academics
Comparing	Comparing myself to others
Soc Media	Comparing my life to others on social media
Meet Expectations (Other)	Meeting other peoples' expectations of me
Meet Expectations (self)	Meeting my own expectations

Personal

Sleep	Getting enough sleep
Exercise	Getting enough exercise
Nutrition	Making sure I eat healthy
Cooking	Having to prepare meals for myself
Balance (Work)	Balancing working at my job with academics
Balance (Extracurriculars)	Balancing my extracurriculars with academics
Hobbies	Feeling guilty about taking time for my hobbies/interests
Loans	Having to take student loans
Debt	Worrying about paying off debt
Job	Worrying about getting a job after graduation
New Program	Worrying about getting in to a new program after graduation
Life Events	Worrying about meeting major life events (e.g., marriage)