

Title: Mental health need of students at entry to university: Baseline findings from the U-Flourish Student Well-Being and Academic Success Study

Short Title: Student mental health need at entry to university

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Conflict of Interest Disclosures

No author has a conflict of interest relevant to this manuscript to disclose

Author Contribution

Duffy designed and was responsible for conducting the study and overseeing data collection. Rivera led student engagement and Cunningham and Milanovic developed the online survey in collaboration with all authors. Duffy, King, Pickett and Bowie planned the analysis and King took the lead with data cleaning and analysis. Duffy, Pickett and King led the writing of the manuscript and all authors contributed to revisions of the manuscript. All authors approved the final version of this manuscript.

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ABSTRACT

Objective

Transition to university is associated with unique stressors and coincides with the peak period of risk for onset of mental illness. Our objective in this analysis was to estimate the mental health need of students at entry to a major Canadian university.

Methods

After a student-led engagement campaign, all first year students were sent a mental health survey, which included validated symptom rating scales for common mental disorders. Rates of self-reported lifetime mental illness, current clinically significant symptoms and treatment stratified by gender are reported. The likelihood of not receiving treatment among those symptomatic and/or with lifetime disorders was estimated.

Results

Fifty-eight percent of all first-year students (n= 3,029) completed the baseline survey, of which 28% reported a lifetime mental disorder. Moreover, 30% of students screened positive for anxiety symptoms, 28%, for depressive symptoms, and 18% for sleep problems with high rates ($\cong 45\%$) of associated impairment. Only 8.5% of students indicated currently receiving any form of treatment. Females were more likely to report a lifetime diagnosis, anxiety and depressive symptoms, as well as current treatment. Over 25% of students reported lifetime suicidal thoughts and 6% suicide attempt(s). Current weekly binge drinking (25%) and cannabis use (11%) were common, especially in males.

Conclusions

There is limited systematically collected data describing the mental health needs of young people at entry to university. Findings of this study underscore the importance of timely identification of significant mental health problems as part of a proactive system of effective student mental health care.

KEY WORDS

university mental health, psychopathology, mental disorders, prevalence, anxiety, depression, substance use disorders, psychopathology, prevention, early intervention

INTRODUCTION

Transition to university coincides with an important developmental period characterized by increasing responsibility for regulating behaviour, making important life choices, and forming new social networks; all while beginning to separate from core family influence and support (Chung & Hudziak, 2017). Many students attend university far from home and have to navigate concentrated study periods in a competitive environment – all while coping with unique stressors and financial pressures (Universities UK, 2018). Until recently, it has been assumed that university students were a relatively privileged group of young people with low rates of mental illness. However, recent reports of a high prevalence of mental health problems in postsecondary students have challenged this assumption (Auerbach et al., 2016; Auerbach et al., 2018). University enrolment and the diversity of the student population are increasing (Universities Canada, 2011, 2018). Further, transition to university coincides with the peak period of risk for the onset of mental illness (Kessler et al., 2007; Merikangas et al., 2010). Recognition of emergent mental illness and differentiation from situational or transient distress is of paramount importance. Untreated or inadequately treated mental illness is associated with significant burden in this population including school failure, interpersonal problems, substance abuse, and suicide (Hawton, Saunders, & O'Connor, 2012; Kessler, Foster, Saunders, & Stang, 1995; McGorry, Purcell, Goldstone, & Amminger, 2011).

Consistent with recent epidemiological studies (Auerbach et al., 2016; Auerbach et al., 2018; Blanco et al., 2008) and contemporaneous with initiatives to reduce stigma (Linden, 2017; Stuart, 2016), there has been a significant increase in demand for student mental health services which threatens to overwhelm resources as currently organized. Such trends, documented both in

Canada (Report of the Principal's Commission on Mental Health Queen's University, 2012; Universities Ontario, 2017) and internationally (Royal College of Psychiatrists, 2011; Universities UK, 2018), represent a major challenge for clinicians, educators, university administrations, and students. The Canadian evidence base available to inform the development and planning of university student mental health services is limited; with existing studies suffering from low response rates, reliance on measures that sometimes lack validity, and study designs that limit the ability to characterize trajectories or identify important contributors to outcomes. To address these gaps, we launched the U-Flourish Student Well-Being and Academic Success Study (U-Flourish Study) with the overarching aim to understand what factors contribute to individual differences in mental health and the implications of mental health problems for academic success and resource planning (Goodyday et al., 2019). While longitudinal in design, this analysis focused on the baseline survey (i.e., Fall 2018) data to describe the burden of mental illness in students at entry to university and current treatment rates. We expected that the lifetime rates of psychopathology would be comparable to those of large international epidemiological studies.

METHODS

Overview of baseline survey

The full protocol for the U-Flourish Study is published elsewhere (Goodday et al., 2019). Briefly, after a student-led engagement campaign at the commencement of the fall term, all first year undergraduate students (including those in law and medicine) were sent an email link to complete the U-Flourish Well-being and Academic Success Survey that asked about family, personal, environmental risk and protective factors. The survey included brief validated symptom screening scales for common mental disorders. In this analysis we focus on the demographic, self-report lifetime history of mental disorders, symptom rating scores, and self-reported receipt of treatment, as described below. This research was conducted in accordance with the World Medical Association Declaration of Helsinki and ethics approval for this study was received from the Queen's University and Affiliated Teaching Hospitals Research Ethics Board (PSIY-609-18).

Key Variables

Demographic

Age in years was calculated based upon the difference between the date of survey administration and registered date of birth. Gender was self-identified categorically. Ethnicity was indicated from a standard list, with participants asked to check all categories that applied. Domestic or international status was determined with supplemental items asking, where applicable, for home province of residence. Students also reported the highest level of education completed by either parent or parent figure. Program of study was acquired from the university database linked through student number.

Symptoms of Common Mental Disorders

Anxiety symptoms were measured using the Generalized Anxiety Disorder 7-item Scale (GADS-7) (Spitzer, Kroenke, Williams, & Lowe, 2006). Participants rated responses (i.e., 0= “*Not at all*” to 3= “*Nearly every day*”) to seven questions. Total scores of 10 or more were considered screening positively for clinically significant symptoms (Lowe et al., 2008). In students screening positive, associated functional impairment was considered present if anxiety symptoms were rated as making it “*very difficult*” or “*extremely difficult*” to do work, take care of things at home, or get along with other people.

Depressive symptoms were measured using the Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, & Williams, 2001). Response options to 9 questions were rated using self-reported responses identical to the GADS-7 (above). Total scores of 10 or more were considered screening positively for clinically significant symptoms. Associated functional impairment was captured using the same ratings as described above for anxiety-related impairment.

Substance misuse was operationally defined as engaging in at least one of the following behaviours, at least once per week in the past month: binge drinking (i.e., 4 or more drinks on a single occasion), cannabis use, use of non-prescribed sleeping or wake-up pills or stimulants, use of pain killers or opiates, and illicit drugs (psychedelics and other recreational drugs such as cocaine).

Attempted suicide or suicide ideation was identified by responses to the following questions taken from the Columbia Suicide Rating Scale (Posner et al., 2011): “*Have you ever had any thoughts about ending your life?*” and “In your entire lifetime, have you made any attempts to end your life?” Self-harm was identified by responses to the question: “*Have you ever harmed yourself without the intent of ending your life?*”

Quality of sleep was measured using the Sleep Condition Indicator (Espie et al., 2014) an 8-item rating scale assessing sleep quality and quantity, and the effect of poor sleep on daytime functioning. Items were summed (possible range of 0-32) and a total score of 16 or less indicated “clinically significant” poor sleep quality or insomnia.

Lifetime Mental Disorders and Learning Disabilities

Participants reported whether they had ever been diagnosed with a mental disorder or learning disability from a provided list: “*Mood disorder (e.g., depression, dysthymia, bipolar disorder)*”, “*Anxiety disorder (e.g., PTSD, social phobia, generalized anxiety disorder, etc.)*”, “*Psychotic disorder (e.g., schizophrenia, drug induced psychosis)*”, “*Eating disorder (e.g., bulimia nervosa, anorexia, etc.)*”, “*Neurodevelopmental disorder (e.g., autism, ADHD, Asperger’s)*”, “*Sleep disorder (e.g., insomnia)*”, “*Suicidal ideation/attempt*”, “*Substance misuse (e.g., cannabis, alcohol)*” or “*Learning Disorder*”.

Mental Health Treatment

Participants reported whether they were *currently receiving treatment or support* for a mental health condition (“Yes” or “No”), and then if Yes asked to specify what type of treatment or support: “Pharmacological (medication)”, “Psychological (counselling)” or “Both”.

Mental and Physical Health

Participants rated their current mental and physical health status on a 5-point scale: “*very poor*” through “*average*” to “*very good*”. They were asked to report if they had ever suffered from any condition listed in a standard list of physical illnesses. *Body Mass Index (BMI)* was calculated from self-reported height and weight, and categorized into adiposity subgroups, with age- and sex-adjusted thresholds for those <18y of age.(Cole, Flegal, Nicholls, & Jackson, 2007)

Statistical Analysis

All analyses were completed using SAS Version 9.4 (SAS Institute Inc., 2017). To assess representativeness, the demographics of participants (n=3,029) were compared to all first year students (n=5,242) eligible to take part. We described the indicators of mental illness and symptoms of common mental disorders, as well as physical health both overall, and stratified by self-identified gender (“male”, “female”, “other identity”), with differences examined using chi-square tests **for independence**. Among those who self-reported a lifetime diagnosis and those meeting clinical symptom cut-offs on screening scales, we estimated the percentage of those students who reported that they were not currently receiving treatment or support. Analyses were stratified first by gender, then by age group (<18y, 18-19, 20y or older), and domestic or international status. A series of crude and adjusted log-binomial regression models were used to estimate the likelihood of receiving no treatment or support among those diagnosed or symptomatic of any mental disorder. Based upon our realized sample size and prevalence of non-

treatment, these analyses were 80% powered to detect relative risks of 1.05 to 1.24 (alpha=0.05, 2 sided).

RESULTS

Sample

The 3,029 study participants represented a 58% response rate of all first year students. Respondents were most commonly 18-19 years of age, female, of white or Asian ethnic backgrounds, domestic students from the province of Ontario, and from families with high levels of formal education (**Table 1**). When compared with the 5,242 eligible first year students, survey participants were significantly more likely to be female (66% vs. 58%; χ^2 , $p<.01$), slightly younger (mean 18.2 vs. 18.5 years, $p<.01$), and domestic Canadian students (90.1% vs. 87.3%; χ^2 , $p<.01$), with similar distributions by province of residence (domestic students only) and program of study.

INSERT TABLE 1 HERE

Table 2 describes self-reported physical and mental health indicators in the full sample and stratified by gender. Twenty-eight percent of the sample had a history of one or more diagnosed mental disorders, and 14% rated their current mental health as below average (i.e., “*poor or very poor*”). Only 8.5% of the full sample indicated that they were currently receiving any form of mental health treatment. Females were significantly more likely than males to report having been diagnosed with a mental disorder and be receiving treatment. Over one-third of the sample reported clinically significant anxiety symptoms, 28% reported clinically significant depressive symptoms, and 18% reported significant sleep problems. Over 25% of students reported having had thoughts about ending their life and 6% having made a prior suicide attempt. Clinically

significant symptoms and suicide ideation/ attempts were significantly more common in females than males, and descriptively were the most common in the “other” self-identified gender group.

Of those students who screened positively for anxiety symptoms, 40% (70/176) of males, 49% (339/700) of females, and 46% (5/11) other gender reported associated functional impairment with 89% (81% to 96%), 76% (71% to 80%), and 40% (5% to 85%) not currently receiving treatment, respectively. Of those who screened positive for depressive symptoms, 41% (68/168) of males, 46% (263/570) of females, and 64% (7/11) of other gender reported associated functional impairment, with 87% (79% to 95%), 76% (71% to 81%), and 57% (21% to 94%) not currently receiving treatment.

INSERT TABLE 2 HERE

The prevalence of self-reported substance use is described in **Table 3**. Substantial proportions of the students reported engaging in weekly use of substances, with significantly higher levels (absolute differences of 1.9% to 13%; $p < .001$) reported among males than females (i.e., overall, and for binge drinking, cannabis and illicit drugs use).

INSERT TABLE 3 HERE

Specific student lifetime diagnoses and family history of mental disorders are more fully described in **Figure 1**. Females were more likely to report a lifetime mental disorder or physical illness or family history of illness than males. The most common reported diagnoses were anxiety disorders, learning disabilities, and mood disorders. The most common reported physical health conditions were allergies, lung or breathing problems, ear, nose or throat problems, and chronic pain. Forty-three percent of the students reported one or more learning disabilities or mental disorders in their first-degree (siblings, parents) family members.

INSERT FIGURE 1 HERE

Among those students who reported a lifetime mental disorder or who met clinical-cut off scores on symptom rating scales, a significant proportion (81% of males, 67% of females, and 57% of other gender) indicated that they were not receiving any form of treatment (medication and/or supportive counselling or psychotherapy) (**Table 4**). Symptomatic males without a formal diagnosis were least likely to be receiving any treatment or support (94%; CI: 92.1% to 96.0%).

INSERT TABLE 4 HERE

The log-binominal regression analyses (**Table 5**) suggested that age, domestic vs. international status, program of study, and level of parental education had little impact on whether or not someone was receiving treatment or support. Those reporting more mental health disorders (i.e., higher comorbidity) were more likely to receive treatment or support.

DISCUSSION

In this large representative sample of students entering a major Canadian university we found high rates of self-reported lifetime mental disorders and learning disabilities. We also documented a high prevalence of students who screened positively for current symptoms of common mental illness, often with associated functional impairment. This pattern was consistent across age, gender, ethnicity, domestic vs. international status, and study program. The extent to which the prevalence of these disorders and significant symptoms exceeded levels of current clinical treatment or support was striking, especially for males. These findings support the need for development of accessible, developmentally appropriate and evidence-based early intervention mental health services on campus and partnerships to early intervention clinical

services in the community. As discussed recently in *Lancet Psychiatry* (Duffy et al., 2019), a coordinated system of care should start with engaging clinical triage at point of first contact integrated with a stepped care model of service delivery. The aim would be to provide the appropriate level of intervention at the earliest possible time with facilitated transitions to more specialized community-based services as needed. Mental health is strongly associated with academic performance and successful higher education is a major social determinant of individual and societal prosperity and development (Patton et al., 2016).

Our primary findings are consistent with data from recent Canadian university annual reports and white papers concerning student mental health (Colleges Ontario and the Council of Ontario Universities, 2017; Coordinating Committee of Vice Presidents Students, 2015). To our knowledge, the only systematically collected data describing rates of mental illness in Canadian university students comes from the semi-regular National College Health Assessment (NCHA) cross-sectional survey, which reported similar rates of mental illness. Historically, NCHA findings must be interpreted cautiously due to low response rates (under 20%) limiting generalizability (American College Health Association, 2016). Our study provides Canadian specific data and expands on the NCHA surveys by using validated symptom rating scales and achieving nearly triple the response rate (58% of all first year students).

Beyond Canada, as we hypothesized, our findings are in line with those reported in the international WHO-WMHS study of mental disorders among 18-22 year olds in which the 12-month prevalence of mental disorders was 25% in high-income countries, with only 16% of

diagnosed students receiving minimally adequate treatment (Auerbach et al., 2016). Moreover, rates of common mental disorders were comparable to those in our study in terms of reported 12-month estimates of anxiety (11.7%), mood disorders (6.0%), and substance use disorders (4.5%). A subsequent WHO-ICS study used a similar web-based survey format to our own, with application of validated screening scales among first year college students. The WHO-ICS study estimated lifetime and 12-month prevalence of any mental disorder of 35% and 31%, respectively, comparable to general population rates of severe mental disorders (Auerbach et al., 2018).

The findings of our study highlight the mental health needs of students transitioning to a major Canadian university. However, they do not provide an explanation of the origin of such conditions or explain why mental illness has emerged as one of the leading health issues facing this generation of young people, including those who attend university. Systematic research employing both quantitative and qualitative approaches, and incorporating a longitudinal design is required to understand contributing factors to student mental health outcomes and the impact on academic success. However, evidence from this study, although preliminary, points to specific prevention and early intervention targets including alcohol and drug use, impairing anxiety and mood symptoms/disorders. The implications of our findings are clear – while valuable, a focus only on health promotion, in the absence of a proactive system providing accessible assessment and when indicated care, is unlikely to address the substantial mental health needs of the university student population.

The strengths of this study include: a large cohort representing 58% of potential student respondents, measures with good psychometric properties that represent multiple domains of interest in this population, and addressing a gap in information about university students in the Canadian context. However, there are some limitations that should be discussed. First, comparisons with the sampling base suggest that our findings more fully represent the experiences of younger, female, domestic students. The greater response rate for females is common for online, student-based surveys (Sax et al., 2008). The clinical cut-off scores used for symptom screening measures employed represent a balance between sensitivity and specificity and do not equate to a clinical diagnosis. Screening positive indicates a need for further assessment, rather than confirming the presence or absence of illness. However, for the purposes of identifying students appropriate for prevention and early intervention, psychopathology at the symptom level is appropriate. The survey data are self-reported in nature and were not confirmed by direct assessment. Finally, as this survey was conducted early in the school year, and the majority of students entering Queen's University have a permanent residence that is not local, this places limits on the percentage expected to be currently under care for mental health conditions. It may also indicate the lack of resources or engagement in resources in the students' home communities.

CONCLUSION

In this initial report from the U-Flourish Study, we document the lifetime prevalence of self-reported mental disorders and learning disabilities at entry to university and the prevalence of significant symptoms associated with common forms of mental illness. A notable finding was the substantial percentage of students who were diagnosed or symptomatic of a mental disorder and not receiving any form of support or care and the immense potential burden this places on the

university and the students themselves. The occurrence of mental disorders and symptoms was ubiquitous across the study body, although there was a gendered pattern to rates of disorders and symptoms, as well as receiving care. Academic success is a major driver of societal development, and depends upon mental health and well-being (Patton et al., 2016). Therefore, these findings strongly support the need to augment investment in mental health screening and clinical services that are evidence-based, developmentally appropriate and tailored to the student population (Duffy et al., 2019). While the responsibility for provision of student mental health care rests with many agencies and stakeholders, it is our view that the university must take a lead role in developing evidence-informed resources and advocating for facilitated care pathways to effective campus and community services forming an integrated system to ensure students have timely access assessment and the appropriate level of care when needed.

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