



Mood disorders in higher education in Flanders during the 2nd and 3rd COVID-19 wave: Prevalence and help-seeking: Findings from the Flemish College Surveys (FLeCS)

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ABSTRACT

To examine the prevalence of 12-month mood disorders and receipt of mental health treatment among a volunteer sample of higher education students during the 2nd and 3rd COVID-19 wave in the Flanders region. Web-based self-report surveys were obtained from 9101 students in higher education in the Flemish College Surveys (FLeCS) in Flanders, Belgium. As part of the World Health Organization's World Mental Health-International College Student Initiative, we screened for 12-month mood disorders (major depressive episode (MDE), mania/hypomania), and service use. We used poststratification weights to generate population-representative data on key socio-demographic characteristics. 50.6% of the respondents screened positive for 12-month mood disorders (46.8% MDE, of which 22.9% with very severe impact). Use of services was very low, with estimates of 35.4% for MDE, 31.7% for mania, and 25.5% for hypomania. Even among students with very severe disorders, treatment rates were never higher than 48.3%. Most common barriers for not using services were: the preference to handle the problem alone (83.4%) and not knowing where to seek professional help (79.8%). We found a high unmet need for mood problems among college students; though caution is needed in interpreting these findings given the volunteer nature of the sample. A reallocation of treatment resources for higher education students should be considered, particularly services that focus on innovative, low-threshold, and scalable interventions.

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1. Introduction

Mood disorders are common and impairing conditions among college students worldwide (Auerbach et al., 2016, 2018). Approximately 25–30% of students in higher education meet criteria for a 12-month mood disorder (Auerbach et al., 2018; Flesch et al., 2020). Mood disorders in college are associated with substantial role impairment (Alonso et al., 2018) and lower academic functioning (Bruffaerts et al., 2018), and, in the long-term, relationship dysfunction (Kerr and Capaldi, 2011), and low general functioning in later life (Niederkrotenthaler et al.). These long-term outcomes may be precipitated by mood problems that exist during the college years, as these years constitute a peak period for their first onset (Zivin et al., 2009; Benjet et al., 2022; Ebert et al., 2019a). In recent decades, many colleges have begun implementing risk assessment and prevention programs to reduce the high burden of mood problems (Harrod et al., 2014; Reavley and Jorm, 2010). Several psychological treatments have demonstrated the ability to treat depressive disorders (Cuijpers et al., 2016), but, cross-national data show that among college students reporting mental disorders in the past 12 months, as few as 20–25% used mental health services in the past year (Bruffaerts et al., 2019; Blanco et al., 2008). Moreover, many students do not engage in treatments even when they are available (Eisenberg et al., 2011; Han et al., 2016). Low treatment utilization among students may be unexpected, as treatment-seeking is higher among younger people (Wang et al., 2007), and colleges typically have a student health center or other treatment facilities that provide low-threshold access to professional care (McBride et al., 2013). Known barriers to treatment include attitudinal (e.g., preference for self-management and perceived stigma) and structural barriers (e.g. financial concerns and lack of time; Sareen et al., 2007; Gulliver et al., 2010).

Both the high prevalence of mood problems and low help-seeking behaviors were likely potentiated by the pandemic. In Belgium, the prepandemic 12-month prevalence of internalizing and mood problems among college students was 15–24% (D’Hulst et al., 2021; Bruffaerts et al., 2018). However, we may assume that, with closed schools, social distancing, and a more restricted access to in-person healthcare services, there has been an exacerbation of mental health problems among college students (Wang et al., 2020; Van de Velde et al., 2021; COVID-19 Mental Disorders Collaborators, 2021). Globally, virtually all college students were emotionally affected by the pandemic, resulting in high estimates of anxiety and depressive problems in higher education (Li et al., 2021; Browning et al., 2021), combined with low treatment rates. Although these studies are informative, they also are notable limitations. First, most reported findings are limited to participating institutions, and thus do not provide reliable estimates with regard to a specific region or state. Second, college studies conducted during the pandemic often use non-representative sampling methods and do not use adequate weighting strategies to increase sample representativeness with regard to the broad student population. Third, virtually all reports gathered in the pandemic assessed depressive symptoms without using formal diagnostic criteria of mood disorders and/or estimated severity of the disorder. Our study addresses these limitations by estimating the 12-month prevalence of mood disorders among higher education students across all the 18 colleges and universities in Flanders, Belgium. The specific aims of the current report include: (a) estimate the proportion of respondents with positive screens of 12-month mood disorders; (b) examine the types of mood disorders and levels of severity; (c) examine the unmet need for treatment and barriers to treatment for the different types of mood disorders, across levels of severity; and (d) estimate multivariate socio-demographic and college-related correlates of treatment and barriers to treatment during the second COVID-19 in Flanders.

2. Methods

2.1. Instrument

The current report used data collected in the Flemish College Surveys (FleCS), to gain population-level estimates on the descriptive epidemiology of mental disorders among higher education students in the Flanders region of Belgium. The FleCS makes part of the WHO World Mental Health International College Student (WMH-ICS) Initiative (http://www.hcp.med.harvard.edu/wmh/college_student_survey.php). The WMH-ICS was initiated to obtain accurate longitudinal information about the prevalence and correlates of mental, substance, and behavioral disorders among college students worldwide (Cuijpers et al., 2016). The initial phase of the initiative involves carrying out surveys with higher education students to estimate the prevalence of mental disorders, associated impairments, adverse social and academic consequences, and patterns of help-seeking.

2.2. Sampling

Data gathered in the FleCS database were the result of a combination a collaboration between the Leuven College Surveys and the Vlaamse Vereniging voor Studenten (VVS). For the Leuven College Surveys, respondents were invited by email using similar procedures described in prior studies (Bruffaerts et al., 2018). For the remaining participating university colleges and universities, the study was announced on both the VVS and the Flemish Ministry of Education websites and social media accounts. No additional advertising of the survey was done and no incentives for participation were offered. The survey ran between 8 October 2020 and 15 May 2021.

2.3. Procedures

Students were invited to participate in a web-based self-report health survey. The initial mode of contact varied across the partners that provided data. Data provided for this study were gathered using both a probabilistic sample for the Leuven College participants and a volunteer sample for the VVS participants. The procedure for the *probabilistic sample* was as follows: the Leuven College Surveys were part of a health evaluation for students via their student email addresses, provided through the institutional services. Initial non-respondents were recontacted through a series of personalized reminder emails containing unique electronic links to the survey (with a maximum 5 reminders). By contrast, for the *non-probabilistic approach*, data were collected by a weblink that was posted on the VVS website. Respondents that entered the survey using the non-probabilistic path of data collection were first asked whether they already participated through the Leuven College Surveys in order to reduce any overlap, and redirect them to the appropriate survey.

2.4. Ethical considerations

Informed consent was obtained before administering the questionnaires. Standardized descriptions of the goals and procedures of the study, data uses and protection, and the rights of respondents were provided in written form to all potentially eligible respondents before obtaining informed consent for participation in the survey. The institutional review board of organization that coordinated the survey in Belgium approved and monitored compliance with procedures for obtaining informed consent and protecting respondents. The study protocol was approved by the KULeuven Ethical Committee (reference #S62111).

2.5. Measures

2.5.1. Socio-demographic and college-related characteristics

Respondents were asked for gender (male, female, other), age, whether they were first or higher-year students, and whether they were part-time or full-time student.

2.5.2. Risk for mood disorders and associated impairment

Due to the size and logistical complexities of the surveys, we did not administer in-depth psychiatric diagnostic interviews to each student. Instead, the survey instrument consisted of a broad range of short validated self-report screening scales. As described in more detail elsewhere (Auerbach et al., 2018), 12-month DSM-V disorders were assessed using the validated self-report screening scales of the widely used Composite International Diagnostic Interview (Kessler et al., 2013; Kessler and Ustun, 2004). These included the CIDI Screening Scales (Kessler et al., 2013; Kessler and Ustun, 2004) for 12-month mood disorders, including major depressive episode (MDE) and mania/hypomania. The CIDI-SC scales have concordance with blinded clinical diagnoses in the range area under the curve (AUC) = 0.70–0.78 (Kessler et al., 2013; Ballester et al., 2019).

The severity classification of MDE was based on 12-month severe role impairment in daily life, which was assessed with a revised version of the Sheehan Disability Scale. Respondents were asked the extent to which problems with mental or physical health interfered with their functioning during the past 12 months in the following 5 response options: no interference, mild, moderate, severe, and very severe interference. The domains were performance at school and social life, and close personal relationships. As a measure of impact, the composite score ranged from 2 to 10, as each of the 2 items is scored from 1 (*no interference*) to 5 (*very severe interference*). Overall role impairment was scored as no interference (1–2), mild (3–4), moderate (5–6), severe (7–8), and very severe (9–10) interference (Kessler and Ustun, 2004; Kessler et al., 2014).

2.5.3. 12-Month service use, need for treatment and barriers of treatment

All respondents were asked whether they received psychological counseling or medication for an emotional or substance problem in the past 12 months (Hoge et al., 2004; Kessler and Ustun, 2004; Ursano, 2012). Respondents that did not receive psychological counseling or medication for an emotional or substance problem in the past 12 months were asked: “*Was there ever a time in the past 12 months when you felt that you might need psychological counseling or medication for any emotional or substance use problems?*” If respondents indicated that they needed psychological counseling or medication, they were asked: “*How important were each of the following reasons for why you did NOT seek help for your problem(s)?*”. Reasons listed were: “*You are not sure available treatments are very effective*”; “*You would want to handle the problem on your own*”; “*You would be too embarrassed*”; “*You would talk to friends or relatives instead*”; “*You think it costs too much money*”; “*You are unsure of where to go or who to see*”; “*You anticipate problems with time, transportation, or scheduling*”; “*You are afraid it might harm your school or professional career*”; “*You are afraid of different treatment from others*”; and “*Other reasons*” (1 = very important; 2 = important; 3 = moderately important; 4 = somewhat important; 5 = unimportant; Hoge et al., 2004; Kessler et al., 2008; Ebert et al., 2019a). Each barrier was analyzed as a dichotomous variable, defining a barrier as present when respondents indicated that the importance of a barrier was endorsed as at least “moderately important”.

2.6. Statistical analyses

All analyses were performed using R (version 3.6.2) and R Studio (version 1.4.1103) software. The packages “tidyverse 1.3.1”, “broom 0.7.10”, “survey 4.1–1”, “Hmisc 4.5–0”, and “srvyr 1.1.0” were used for the statistical analyses. Calibration weights were computed to adjust for

differences between gender, first grade, and university/college student distributions in the sample and the general population features of students in higher education in Flanders (Lumley et al., 2011). These weights were obtained by iterative proportional fitting (“raking” – see Deville and Sarndal, 1992) on the basis of population marginal proportions (information was provided by the Flemish Ministry of Education).

Descriptive statistics and prevalence estimates are reported as weighted numbers (n), and weighted proportions (%) with associated standard errors. The standard errors were multiplied by 1.96 to obtain the 95% CI. Survey-weighted Logistic regression analysis (Thomas Lumley’s survey R package Version 4.1–1) was used to test the strength of associations between predictors and treatment use in the past 12 months. Predictors were evaluated in bivariate (in which only one predictor was considered) and multivariate models adjusting for first grade, gender, studying at university (vs. non-university college). Regression coefficients and standard errors were exponentiated to create odds ratios (ORs) and associated 95% confidence intervals. To compare for differences in proportions of reported barriers across levels of severity and number of mood disorders, a chi-square test was used.

To compare differences in proportions for socio-demographic features, college-characteristics, prevalence of mood disorders and service use between the probabilistic and non-probabilistic sample, a chi-square (χ^2) test was used. The probabilistic and the non-probabilistic sample differ significantly in socio-demographic and college-related characteristics. Those from the non-probabilistic sample had significant higher prevalence of positive MDE screens and number of mood disorders. Furthermore, these students experienced significant higher impact on daily living due to mental health problems and a significant difference in treatment use is found (Appendix 1). Lastly, there was a higher proportion of unmet need for treatment in the non-probabilistic sample and there were significant differences in the following barriers to treatment: “concerns about the effectiveness of treatment”, “talked to friends or relatives instead”, “thinking it costs too much money”, “problems with time, transportation or scheduling” (Appendix 2).

3. Results

3.1. Sociodemographic description of the sample

Between October 2020 and May 2021, 16,128 students participated in the study. For the present analyses, we report findings among respondents with complete records (n = 9722). We also restricted the sample to full-time students, and excluded those with missing information on treatment status (n = 97), those who did not identify as male or female (n = 101), and those who reported part-time status (n = 436). The final sample included 9101 full-time students (55.6% female; mean age = 20.2; SD = 2.81). Almost one-fourth were first-year students (21.4%). The response rate based on the surveys we obtained through the probabilistic sample was 23.5%. Based on registry data from the Flemish Ministry of Education, we estimate the response rate for the non-probabilistic sample at 2.3% (i.e. 6509 of total 245,767 registered higher education students in Flanders in the academic year 2020–2021).

3.2. 12-Month positive screens for mood disorders

Almost half of the respondents (46.8%, 95% CI: 45.6–48.0) screened positive for 12-month major depressive episode (MDE) (see Table 1). Among these, 4.1% were classified as mild, 24.9% as moderate, 48.4% as severe, and 22.9% as very severe. Further, 6.6% (95% CI: 6.0–7.2) screened positive for mania, and 4.6% (95% CI: 4.1–5.1) for hypomania.

3.3. 12-Month service use for mood disorders

Table 1 shows that of the total FleCS sample, 33.9% of students with MDE, 29.0% of those with mania, and 25.0% of hypomania had used

Table 1
Sociodemographic and clinical variables as baseline predictors for treatment use.

Prevalence		Bivariate model ^b							Multivariate model ^c		
		Subsample no. 12-m treatment use (psychological or medication)							Subsample no. 12-m treatment use (psychological or medication)		
		n (w)	% (w)	(SE)	n (w)	% (w)	(SE)	OR	95%CI	OR	95%CI
All students (N = 9101) ^a					1947	21.4	0.48	-	-	-	-
Sociodemographics	<i>Being female</i>	5060	55.6	0.63	1401	27.7	0.60	2.45	(2.13–2.81)	-	-
College-related socio-demographics	<i>First-year student</i>	1948	21.4	0.39	337	17.3	0.64	0.72	(0.65–0.8)	-	-
	<i>University students</i>	4795	52.7	0.61	993	20.7	0.65	0.92	(0.82–1.03)	-	-
12-month prevalence of mood disorders	<i>Major Depressive Episode</i>	4259	46.8	0.61	1440	33.8	0.81	4.37	(3.85–4.95)	3.9	(3.43–4.43)
	<i>Mania</i>	604	6.6	0.30	175	29.0	2.10	1.55	(1.26–1.91)	1.6	(1.29–1.98)
	<i>Hypomania</i>	423	4.6	0.26	106	25.0	2.36	1.24	(0.96–1.59)	1.26	(0.97–1.64)
	<i>Any</i>	4608	50.6	0.61	1477	32.1	0.77	4.04	(3.55–4.58)	3.66	(3.21–4.17)
Number of mood disorders in past 12 months^d	<i>0</i>	4493	49.4	0.61	470	10.5	0.51	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
	<i>1</i>	3931	43.2	0.60	1233	31.4	0.83	3.91	(3.43–4.46)	3.52	(3.08–4.02)
	<i>2</i>	677	7.4	0.31	244	36.0	2.07	4.81	(3.92–5.92)	4.38	(3.53–5.43)
Severity of MDE	<i>Mild</i>	174	4.1	0.34	23	13.5	2.60	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
	<i>Moderate</i>	1047	24.9	0.75	226	21.6	1.40	1.78	(1.11–2.83)	1.76	(1.11–2.8)
	<i>Severe</i>	2062	48.4	0.88	719	34.9	1.17	3.45	(2.2–5.4)	3.54	(2.27–5.53)
	<i>Very severe</i>	977	22.9	0.74	471	48.3	1.85	6.0	(3.78–9.53)	6.56	(4.14–10.39)

Note. Significant odds ratios are shown in bold ($\alpha:0.05$); OR = odds ratio.; CI = confidence interval; SE = standard error.

^a Full-time students (95.5% of the total sample).

^b The bivariate associations are based on a separate model for each row, with the variable in the row as the only predictor in the model.

^c Multivariate associations are based on the predictor in the row and adjusted for being female, first-year student, studying at the university, population.

^d Mania and Hypomania have mutually exclusive diagnostic criteria, therefore the maximum number of mood disorders is 2.

services in the past year, with higher rates for those with mood disorders. Students with comorbid disorders accessed care at higher rates (31.4% with one versus 36.0% with comorbid disorders). Higher role impairment was associated with higher rates of service use (ranging from 13.5% for mild MDE to 48.3% for very severe MDE).

3.4. Bivariate and multivariate correlates of 12-month service use for mood disorders

In bivariate models (Table 1), odds for using services were highest for mental disorders: first, respondents with MDE (compared to those without) yielded the highest odds for service use (OR = 4.37); this was also the case for positive screens for mania, although to a lesser extent (OR = 1.55). Remarkably, hypomania (vs. no hypomania) was not significantly associated with 12-month treatment. Second, number of comorbid mood disorders and greater severity of MDE were associated with higher odds of receiving treatment (OR range between 1.78 and 6.0). Third, female students had higher odds (OR = 2.45) whereas first-year students were less likely to use services (OR = 0.72). These findings remained the same in multivariate models taking into account gender, year, institution, and sample population (Table 1).

3.5. Need for treatment and barriers to treatment among respondents without service use

Table 2 shows that 34.4% of the FleCS sample without service use in the past year did report a need for treatment. Those with a mood disorder clearly expressed a high need, ranging from 42% for mania to 55% for MDE. Almost two-thirds (61.8%) of those with two 12-month mood disorders reported a clear need for treatment, compared to only 58.3% among those with one, and 20.0% among those without any mood disorders (either MDE, Hypomania, and/or Mania). Those with higher MDE severity reported a higher need for treatment: 67.7% of those with very severe MDE reported need for treatment, compared with only 29.6% of those with mild MDE.

The most important barriers to treatment were “the preference to handle the problem alone” (83.9%), “not knowing where to seek professional help” (79.5%), and “concerns about the effectiveness of

treatment” (74.4%), “thinking it costs too much money” (73.6%), “problems with time, transportation or scheduling” (73.0%) in students with a need for treatment but without treatment use in the past 12 months. Barriers pertaining to the role of stigma were less often reported. MDE severity as well as comorbidity were associated with higher barrier prevalence, with two important findings: (a) the more severe the MDE, the more important “talking to friends or relatives instead”, “thinking it costs too much money”, “problems with time, transportation or scheduling”, and “being afraid it might harm your school or professional career” became, and (b) comorbidity was yielded a higher importance of all barriers, except for, “You wanted to handle the problem on your own”.

4. Discussion

To the best of our knowledge, this is the first European study that estimated the burden of mood disorders among college students on the regional level, using weighted data from students gathered across all higher education institutions. First, we found that a high number of students screened positive for a mood disorder during the 2nd and 3rd COVID-19 wave, although only approximately one-fifth of these positive screens were classified as very severe. Second, most students with positive screens for mood disorders did not receive mental health treatment in any form, although those with more severe role impairment and those with comorbid mood disorders had higher use of services. Third, among respondents with mood disorders who did not receive any care, need for treatment was high, and estimated at 52.9%. Fourth, the most common reason for failure to seek treatment among those needing treatment were attitudinal (e.g., “preference to handle the problem alone” and “unsure of where to go or who to see”).

Results should be interpreted in the context of a range of limitations. First, our study had relatively low response rates. We adjusted our findings for differential response to the extent possible by post-stratification, but this could be done only for socio-demographic variables. Residual bias could exist, and there is no way to know the potential magnitude. Further, there is a potential for overestimation of mood disorders when response rates are low (Mortier et al., 2018), and thus, we may have overestimated the proportion of positive screens on

Table 2
Need for treatment in past 12 months & perceived barriers for seeking treatment.

	Need for treatment in past 12 months											
	<i>n</i> (<i>w</i>)	% (<i>w</i>)	(<i>SE</i>)	You were not sure if available treatments were very effective (1)	You wanted to handle the problem on your own (2)	You were too embarrassed (3)	You talked to friends or relatives instead (4)	It costs too much money (5)	You were unsure of where to go or who to see (6)	You had problems with time, transportation, or scheduling (7)	You were afraid it might harm your school or professional career (8)	You worried that people would treat you differently if they knew you were in treatment (9)
All students (N = 7068)	2460	34.4	0.65	70.6% (1.07)	83.1% (0.86)	66.2% (1.09)	59.9% (1.14)	69.8% (1.08)	77.2% (0.97)	69.8% (1.06)	55.5% (1.15)	58.3% (1.14)
12-month prevalence of mood disorders												
<i>Major Depressive Episode</i>	1550	55.0	1.10	75.0% (1.26)	83.6% (1.06)	69.5% (1.31)	55.7% (1.44)	74.7% (1.29)	80.2% (1.15)	73.7% (1.28)	60.2% (1.42)	61.4% (1.41)
<i>Mania</i>	226	52.6	2.88	72.8% (3.58)	82.3% (3.06)	67.9% (3.65)	59.5% (3.78)	75.4% (3.53)	80.5% (3.08)	69.2% (3.71)	64.3% (3.71)	70.7% (3.5)
<i>Hypomania</i>	148	46.7	3.27	77.4% (3.83)	89.8% (2.43)	67.2% (4.42)	56.0% (4.6)	71.5% (4.13)	78.2% (3.94)	68.4% (4.44)	59.2% (4.56)	59.0% (4.59)
<i>Any</i>	1656	52.9	1.05	74.4% (1.24)	83.9% (1.02)	69.1% (1.29)	56.3% (1.4)	73.6% (1.27)	79.5% (1.14)	73.0% (1.26)	60.1% (1.37)	61.4% (1.37)
χ^2				p < .05^b	.22 ^b	p < .05^b	p < .05^b	p < .05^b	p < .05^b	p < .05^b	p < .05^b	p < .05^b
Number of mood disorders in past 12 months ^a												
0	804	20.0	0.73	62.8% (1.99)	81.6% (1.58)	60.1% (1.99)	67.4% (1.91)	61.8% (2)	72.6% (1.81)	63.2% (1.95)	46.0% (2.04)	51.9% (2.03)
1	1388	51.5	1.13	73.0% (1.36)	83.7% (1.11)	69.1% (1.41)	56.5% (1.53)	72.3% (1.41)	78.7% (1.27)	73.3% (1.37)	59.3% (1.51)	60.1% (1.51)
2	268	61.8	2.77	77.9% (2.91)	84.6% (2.51)	69.3% (3.17)	55.2% (3.44)	80.1% (2.85)	83.7% (2.47)	71.5% (3.19)	63.7% (3.36)	67.8% (3.21)
χ^2				p < .05	.46	p < .05	p < .05	p < .05	p < .05	p < .05	p < .05	p < .05
Severity of MDE												
<i>Mild</i>	45	29.6	4.29	–	–	–	–	–	–	–	–	–
<i>Moderate^c</i>	381	46.4	2.00	72.8% (2.37)	84.0% (1.78)	65.2% (2.52)	58.0% (2.65)	72.0% (2.44)	76.2% (2.3)	68.5% (2.46)	50.8% (2.69)	57.9% (2.66)
<i>Severe</i>	782	58.3	1.58	77.0% (1.72)	84.2% (1.53)	71.2% (1.81)	57.8% (2.03)	73.4% (1.87)	81.6% (1.55)	74.5% (1.82)	61.2% (2)	61.5% (1.98)
<i>Very severe</i>	342	67.7	2.55	72.9% (2.9)	82.0% (2.41)	70.9% (2.88)	47.8% (3.17)	81.1% (2.51)	82.0% (2.48)	78.7% (2.57)	69.4% (2.89)	65.4% (3.07)
χ^2				0.25	0.71	0.13	p < .05	p < .05	0.10	p < .05	p < .05	0.18

Note. All analyses were conducted in the subsample with need for treatment (n = 2.460).

Significant p-values are shown in bold (α :0.05).

Abbreviations: SE, standard error; w(n), weighted number of cases; w(%), weighted percentage of sample; χ^2 , Pearson's chi-squared test.

^bComparing Any 12-month mood disorder to those without any mood disorder.

^c Because of the limited number of students with mild severity of MDE (N = 45), the reference category was combined with moderate severity.

^a One cannot screen positive for mania and hypomania at the same time, therefore the maximum number of mood disorders is 2.

mood disorders. Second, we found significant differences between the probabilistic and non-probabilistic sample. In order to deal with possible bias related to this, multivariate models were adjusted for gender, first year, university, and sampling method. In addition, a stratified comparison of both the probability and non-probability sample showed that the direction of the associations between sociodemographic, mental health related, treatment, and reported barriers to treatment were the same between both samples. Third, the survey was conducted among college students in Flanders, Belgium. Students who did not speak the Dutch language sufficiently were not included in this study. This means that, for instance, foreign students (around 12% of total population students in higher education) that do not speak the Dutch language were not eligible for inclusion in the study. Fourth, our data are based on the results of a screening instrument that assessed mood disorders. Other burdensome conditions or other relevant conditions associated with mental health were not included in the present assessment. The screening instrument also precluded detailed assessments on important

socio-demographic predictors of mood disorders (e.g., detailed family situation at time of survey). Fifth, the treatment modules used in the WMH-ICS ask for treatment for emotional or substance abuse problems, and not for depression per se. The information we gathered on treatment access did not include information about the adequacy or effectiveness of the treatment received nor the extent to which treatment availabilities were either affordable or accessible. This means there is a potential for underestimating of the unmet need for treatment. Further, there were no external validity checks with regard to timing of treatment, and this may have resulted in telescoping (i.e. dating past treatment as occurring more recently than it effectively did - Barsky, 2002), resulting in a potential overestimation of service use.

Notwithstanding these limitations, we found a high 12-month prevalence of mood disorders in the general Flemish higher education population. The prevalence of many disorders such as MDE is up to 20% higher than in higher education studies before the pandemic (Auerbach et al., 2018; Bruffaerts et al., 2018; D'Hulst et al., 2021), but in line with

those *during* the pandemic (Wang et al., 2020; De Man et al., 2021; Van de Velde et al., 2021). Reassuring is the finding that only a minority of the positive screens are classified as very severe, a finding that is new since none of the prior studies studied severity levels of mental disorders in the pandemic. Nonetheless, the high prevalence of mood disorders is worrisome, and we may assume it is related to the restrictions due to the COVID-19 pandemic (Wang et al., 2020; Van de Velde et al., 2021). During the 2nd and 3rd COVID-19 wave, student life and academic courses on campus were largely suspended and replaced by either self-study or online teaching. The lack of social cohesion and campus life may have impacted mental health. Experiencing physical symptoms, concerns about relatives' health, reduced social contact, lack of information, and financial loss are all associated with increased mental disorders during the pandemic (Brooks et al., 2020).

Our study confirms the low utilization of treatment among college students. Even though the percentage who received treatment is similar to previous reports with data gathered prior to the pandemic (Han et al., 2016; Dunbar et al., 2018), structural supply shortfalls (especially during the COVID-19 pandemic) may be at least partially responsible for these low treatment rates. It is important to note that higher severity is strongly related to higher treatment use. But, even among the very severe cases, more than half were untreated. Interestingly, our estimates of unmet need are similar to earlier reports (D'Hulst et al., 2021; Bruffaerts et al., 2019), suggesting that in Flanders, the pandemic might not have led to a dramatic increase in the unmet need for mood disorders in higher education.

The help-seeking process of students with mood disorders is complex. Experiencing a treatment need may not be sufficient for a student to contact a professional healthcare provider. It seems that, once a student clearly experiences a need for treatment for their mood problem, they seem to wait and see whether the problem independently subsides and whether they can rid themselves of the behavior (Mojtabai et al., 2002). Accordingly, attitudinal barriers and not structural barriers were found to be the most important reported barriers for not seeking out professional treatment. These findings are generally in line with previous (prepandemic) reports (Ebert et al., 2019b; Gulliver et al., 2010; Vidourek et al., 2014), whereby it is at the same time true that attitudinal barriers might be easier to overcome than structural barriers (Ebert et al., 2019b). Interestingly, the idea is widely accepted that both stigma and financial barriers are among the most significant drivers of not seeking help for mental disorders (Corrigan, 2004; Kohn et al., 2004). Our data challenge this conventional wisdom by showing that, across sociodemographic features and college-related characteristics, the most important reasons for not seeking out help are the wish to handle the problems on their own and a lack of understanding of where to go for treatment. This suggests that the treatment gap that exists among college students cannot be closed by a mere increase of treatment facilities. Efforts to closing the treatment gap will also need to address interventions that specifically tackle the barriers at play in emergent adults with mood disorders, such as student-customized internet platforms with information on emotional health, information on referral to professional healthcare, and information on and access to low-threshold internet interventions, allowing anonymity in the actions taken by an individual student.

Appendix 1. Differences between two samples of college students

5. Conclusion

We provide first estimates on the widespread burden of mood disorders among higher education students in the region of Flanders. Clinicians, policymakers, university officials, and students should be aware of the significance of the prevalence of mood disorders and the high degree of unmet need among college students, their need for treatment as well as specific barriers to treatment (that prevent them from effectively seeking out professional care). The COVID-19 pandemic has likely exacerbated the burden of mood disorders and simultaneously has highlighted the urgent need to address these large proportions of untreated students. Our findings suggest that barriers most often are not structural and/or stigma-related, but instead concern attitudes that people hold toward seeking treatment. Therefore a reallocation of resources based on a stepped care approach may focus on innovative, low-threshold, and scalable interventions, taking into account specific barriers to treatment, with the potential to reach out to students with mental problems who would otherwise not seek help.

Author statement

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Declaration of competing interest

In the past 3 years, Dr. Kessler was a consultant for Datastat, Inc., Holmusk, RallyPoint Networks, Inc., and Sage Therapeutics. He has stock options in Mirah, PYM, and Roga Sciences.

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	Prevalences							Bivariate model ²					Multivariate model ³					Multivariate model ³			
								Subsample no. 12-m treatment use (psychological or medication)													
	probabilistic			non-probabilistic				probabilistic					non-probabilistic								
	n (w)	% (w)	(SE)	n (w)	% (w)	(SE)	p. value	n (w)	% (w)	(SE)	OR	95%CI			n (w)	% (w)	(SE)	OR	95%CI		
All students (N = 9101)¹	2591	28.5	0.52	6509	71.5	0.52		390	15.1	0.67	0.56	(0.5–0.64)	–	–	1557	23.9	0.61	1.77	(1.57–2.0)	–	–
Sociodemographics																					
Being female	1147	44.3	0.97	3912	60.1	0.79	<0.05	251	22.0	0.96	2.45	(1.95–3.08)	–	–	1148	29.4	0.72	1.94	(1.65–2.27)	–	–
College-related socio-demographics																					
First-year student	1473	56.9	1.09	473	7.3	0.26	<0.05	237	16.1	0.72	1.16	(0.93–1.46)	–	–	99	21.0	1.36	0.81	(0.68–0.96)	–	–
University students	1979	76.4	0.73	2815	43.3	0.74	<0.05	263	13.3	0.79	0.61	(0.5–0.75)	–	–	729	25.9	0.94	1.21	(1.06–1.38)	–	–
12-month prevalence of mood disorders																					
Major Depressive Episode	913	35.3	0.98	3345	51.4	0.75	<0.05	286	31.4	1.51	7.07	(5.63–8.87)	6.86	(5.4–8.71)	1153	34.5	0.95	3.64	(3.15–4.21)	3.36	(2.89–3.89)
Mania	150	5.8	0.48	453	7.0	0.38	0.06	37	24.7	3.59	2.04	(1.39–3.0)	2.26	(1.5–3.42)	137	30.4	2.52	1.49	(1.18–1.89)	1.46	(1.14–1.87)
Hypomania	129	5.0	0.45	292	4.5	0.31	0.19	30	23.2	3.81	1.71	(1.12–2.61)	1.85	(1.19–2.9)	75	25.8	2.96	1.11	(0.82–1.51)	1.12	(0.82–1.53)
Any mood disorder	1034	39.9	1.00	3573	54.9	0.75	<0.05	296	28.6	1.3	6.33	(5.03–7.98)	6.26	(4.92–7.98)	1181	33.1	0.91	3.40	(2.93–3.94)	3.17	(2.72–3.68)
Number of mood disorders in past 12 months⁴																					
0	1556	60.1	1.00	2935	45.1	0.75	<0.05	94	6.0	0.56	ref	ref	ref	ref	376	12.8	0.72	ref	ref	ref	ref
1	875	33.8	0.96	3056	47.0	0.74	<0.05	238	27.2	1.46	5.88	(4.64–7.46)	5.77	(4.5–7.4)	995	32.6	0.98	3.31	(2.84–3.85)	3.09	(2.65–3.61)
2	159	6.1	0.50	517	8.0	0.39	<0.05	57	36.3	3.95	9.15	(6.27–13.34)	9.29	(6.21–13.9)	185	35.9	2.42	3.98	(3.14–5.05)	3.6	(2.81–4.62)
Severity of Major Depressive Episode																					
Mild	52	5.7	0.74	121	3.6	0.39	<0.05	7	15.0	3.98	ref	ref	ref	ref	15	12.8	3.30	ref	ref	ref	ref
Moderate	248	27.2	1.51	798	23.9	0.87	0.09	39	15.9	2.05	1.19	(0.6–2.35)	1.23	(0.63–2.42)	186	23.4	1.71	1.69	(1.01–3.35)	2.05	(1.12–3.77)
Severe	434	47.5	1.70	1627	48.7	1.01	<0.05	149	34.5	2.26	2.99	(1.58–5.68)	3.65	(1.94–6.87)	569	35.0	1.35	3.21	(1.79–5.75)	3.63	(2.01–6.55)
Very severe	179	19.6	1.37	797	23.8	0.87	<0.05	89	50.0	3.89	5.44	(2.75–10.74)	6.68	(3.47–12.86)	381	47.9	2.09	5.65	(3.12–10.25)	6.57	(3.6–11.96)

Note. SE = standard error.

¹Full-time students (95.5% of the total sample).

²The bivariate associations are based on a separate model for each row, with the variable in the row as the only predictor in the model.

³Multivariate associations are based on the predictor in the row and adjusted for being female, first-year student, studying at the university, population.

⁴Mania and Hypomania have mutually exclusive diagnostic criteria, therefore the maximum number of mood disorders is 2.

Appendix 2. Need for treatment in past 12 months & perceived barriers for seeking treatment by sample

	Any mood disorder	Need for treatment in past 12 months											χ^2		
		n (w)	% (w)	(SE)	You were not sure if available treatments were very effective (1)	You wanted to handle the problem on your own (2)	You were too embarrassed (3)	You talked to friends or relatives instead (4)	It costs too much money (5)	You were unsure of where to go or who to see (6)	You had problems with time, transportation, or scheduling (7)	You were afraid it might harm your school or professional career (8)		You worried that people would treat you differently if they knew you were in treatment (9)	
non-probabilistic	–	1931	39.0	0.83	71.7% (1.22)	82.6% (1)	66.5% (1.25)	58.5% (1.31)	73.6% (1.21)	78.0% (1.11)	72.4% (1.2)	55.8% (1.32)	57.9% (1.32)		
probabilistic	–	529	24.0	0.95	66.7% (2.19)	85.1% (1.62)	64.8% (2.18)	65.0% (2.21)	55.7% (2.29)	74.4% (1.95)	60.2% (2.24)	54.2% (2.28)	59.6% (2.22)		
					<0.05	<0.05	0.212	0.492	<0.05	<0.05	0.097	<0.05	0.534	0.534	
non-probabilistic	Absent	600	23.6	1.00	63.82% (2.34)	81.23% (1.88)	61.01% (2.34)	66.45% (2.27)	67.32% (2.3)	74.28% (2.11)	67.54% (2.25)	46.23% (2.41)	51.3% (2.4)		
non-probabilistic	Present	1330	55.6	1.23	75.22% (1.4)	83.23% (1.18)	68.99% (1.47)	55% (1.59)	76.45% (1.4)	79.68% (1.3)	74.63% (1.42)	60.11% (1.57)	60.92% (1.57)		
					<0.05	0.359	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
probabilistic	Absent	204	13.9	0.96	59.74% (3.75)	82.77% (2.85)	57.24% (3.73)	70.32% (3.46)	45.74% (3.73)	67.5% (3.5)	50.58% (3.76)	45.19% (3.76)	53.82% (3.73)		
probabilistic	Present	326	44.1	1.93	71.15% (2.61)	86.51% (1.93)	69.56% (2.61)	61.65% (2.84)	61.94% (2.84)	78.67% (2.25)	66.26% (2.72)	59.81% (2.81)	63.15% (2.73)		
					<0.05	0.265	<0.05	0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	

Significant p-values are shown in bold ($\alpha:0.05$).

Abbreviations: SE, standard error; w(n), weighted number of cases; w(%), weighted percentage of sample; χ^2 , Pearson's chi-squared test.

²Comparing proportion of reported barrier between probabilistic and non-probabilistic sample.

²Comparing Any 12-month mood disorder to those without any mood disorder.

Appendix 3. Stratified tables for sample and Any mood disorder

Any mood disorder				
Sample	Gender	n (w)	% (w)	(SE)
non-probabilistic	Male	1246	48.0	1.45
non-probabilistic	Female	2328	59.5	0.78
probabilistic	Male	498	34.5	1.53
probabilistic	Female	537	46.8	1.16
Sample	First-year student	n (w)	% (w)	(SE)
non-probabilistic	No	3304	54.7	0.79
non-probabilistic	Yes	270	56.9	1.72
probabilistic	No	479	42.8	1.93
probabilistic	Yes	556	37.7	0.98
Sample	University students	n (w)	% (w)	(SE)
non-probabilistic	No	1923	52.1	1.01
non-probabilistic	Yes	1651	58.6	1.10
probabilistic	No	211	34.5	1.48
probabilistic	Yes	824	41.6	1.23

Abbreviations: SE, standard error; w(n), weighted number of cases; w(%), weighted percentage of sample.

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