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The sustained increase of mental health symptoms in Chilean university students over three years

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Abstract Given the high rates of mental health problems within the general population and, particularly, the university population, the main goal of this paper is to determine the prevalence of symptoms related to mental health in students at the University Austral de Chile between 2015 and 2017. A convenience sample was taken with a non-experimental correlational design of a transversal character. The final samples were composed of 1631 students in the year 2015, 1518 in 2016 and 1707 in 2017. The Instruments used measured depression, anxiety, stress, hopelessness, alimentary restraint, and functional social support. Reliability analysis, descriptive and polynomial contrast analysis which searched for linear and quadratic trends through ANOVA were performed. The results indicate a sustained rise in the percentages of symptomologies and a decline in the perception of social support. There are also statistically significant differences between men and women surveyed, with women showing more symptoms of depression, anxiety and stress over the three years studied. The results are concurrent with findings on a global level concerning the prevalence of mental health problems in university students. This data has allowed university professionals to better direct their efforts in supporting and treating students and promoting health in general.

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Aumento sostenido de síntomas de salud mental durante tres años en estudiantes universitarios chilenos

PALABRAS CLAVE

Salud mental,
estudiantes universitarios,
prevalencia,
prevención

Resumen Dadas las altas tasas de problemas de salud mental en población general y en particular, en población universitaria, el objetivo principal de este estudio es determinar la prevalencia de síntomas de salud mental en estudiantes de la Universidad Austral de Chile entre los años 2015 y 2017. Se utilizó un muestreo por conveniencia, con un diseño correlacional no experimental de carácter transversal. Las muestras finales se compusieron de 1631 estudiantes en el año 2015,

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1518 en 2016 y 1707 en 2017. Los instrumentos utilizados midieron depresión, ansiedad, estrés, desesperanza, restricción alimentaria y apoyo social funcional. Se realizaron análisis de confiabilidad, descriptivos y de contraste polinómico que buscaron tendencias lineales y cuadráticas a través de ANOVA. Los resultados indican un aumento sostenido en los porcentajes de sintomatologías y una disminución en la percepción del apoyo social. También hay diferencias estadísticamente significativas entre hombres y mujeres encuestados, siendo las mujeres quienes muestran más síntomas de depresión, ansiedad y estrés durante los tres años estudiados. Los resultados coinciden con los hallazgos a nivel mundial sobre la prevalencia de problemas de salud mental en estudiantes universitarios. Estos datos han permitido a los profesionales de la universidad dirigir mejor sus esfuerzos para apoyar y tratar a los estudiantes y promover la salud en general.

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From an evolutionary perspective, there is a general consensus that the majority of mental health problems first appear in emerging adulthood between the ages of 20 and 25, a vital age which presents complex developmental challenges (Arnett, 2000; Kessler et al., 2005). In particular, it is well documented that mental health problems are more common in university students than in young people of the same age who do not attend university (Vicente et al., 2012; Winzer, Lindberg, Guldbbrandsson, & Sidorchuk, 2018). This is likely because young people who pursue university-level studies are faced with a set of normative milestones which often make them more vulnerable to mental health problems (Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015). These include the student moving away from the family of origin, having to become independent and organise their academic responsibilities, postponing defining identity, and facing adult reality, all whilst personal and familial expectations can become stress factors for university students (Pedrelli et al., 2015; Zivin, Eisenberg, Gollust, & Golberstein, 2009). Students, therefore, must suddenly learn to cope with the stress of university, face changes, and assume new responsibilities without having acquired the skills and cognitive maturity of adulthood (Arnett, 2000). Moreover, a high percentage of students present mental health problems before entering higher education (Auerbach et al., 2018).

Over the years, mental health problems in higher education have progressively increased in number (Pedrelli et al., 2015). At the same time, the gravity of psychological problems addressed in university student advisory services has also worsened (Greenbaum, 2018; Hunt & Eisenberg, 2010; Sarmiento, 2015). One complicating factor is that only a small percentage of students who present significant mental health problems (one in six) actually receive any treatment (Auerbach et al., 2018). One of the explanations for this phenomenon suggests that the youth population tends not to spontaneously consult mental health support services (Boydell et al., 2014). Underlying the low numbers in young people who seek help is a low perception of the need for help (Zivin et al., 2009). The per capita income of the country of residence also seems to influence the levels of access to professional help with mental health (Auerbach et al., 2018). Consequently the younger an individual is when they experience the onset of a mental health problem, the greater the severity, chronicity, and level of comorbidity there might be with other disorders, which has long-term implications for those who suffer from these pathologies

and also represents a serious social and economic problem (Iketani et al. 2004; Ramsawh, Weisberg, Dyck, Stout, & Keller, 2011).

With respect to the prevalence of mental health problems, on an international level, authors such as Hunt and Eisenberg (2010) in the United States point out that, in this group, there is the significant prevalence of depressive mood swings and suicidal ideation, together with anxiety disorders, and problematic consumption of alcohol. A recent study of mental health in university students (Auerbach et al., 2018) carried out by the World Health Organisation across eight countries worldwide indicates that, in the studied population (people between the ages of 18 and 22), there was a significant presence of psychopathologies. Anxiety problems were the most prevalent across the study (11.7% - 14.7%), followed by mood problems (6%-9%), substance abuse issues (4.5% - 6.7%), and behavioural problems (2.8% - 5.3%). Phobias (9%-11%) and major depressive disorder (4.5% - 7.7%) were also particularly prevalent (Auerbach et al., 2018). In another study carried out in France, it was found that 72.9% of university students suffered symptoms of psychological distress, 86.3% reported symptoms of anxiety, and 79.3% reported depressive symptoms. Psychological difficulties were significantly greater in women than in men (Saleh, Camart, & Romo, 2017). It is worth mentioning that other international studies also report higher rates of psychological symptoms in women, specifically greater anxiety and general anguish, stress, depression, and suicidal thoughts (Castillo & Schwartz, 2013; Hubbard, Reohr, Tolcher, & Downs, 2018). There is also evidence that the main factors associated with the aforementioned issues are coming from a low economic background, belonging to a racial or ethnic majority, and having a low level of social support (Auerbach et al., 2018; Bruffaerts et al., 2018, Hunt & Eisenberg, 2010).

At the Latin American level, the situation seems to be similar. For instance, a study on Ecuadorian university students carried out by Torres et al. (2017) found a high percentage of students at risk of suicide (13.1%), 6.2% of whom meet the criteria for major depression and 2.2% for generalized anxiety disorder. In general, there is empirical evidence of the high rates of mental health problems in university students from various Latin American countries, and, furthermore, that these prevalences tend to be higher in women (January, Madhombiro, Chipamaunga, Chingono, & Abas, 2018; Ibrahim, Kelly, Adams, & Glazebrook, 2013).

In Chile, a recent study of university mental health which was conducted across three institutions indicated high levels of symptoms of stress amongst students (53.3%), depressive symptoms (46.0%), and anxiety issues (45.5%). 29.7% of those interviewed presented all three symptoms. It also reflects complex eating behaviours and habits (87%) and sleep problems and daytime tiredness (67.2%) (Barrera, 2019). At the regional level, only two previous studies have been carried out and show percentages between 27% and 30.1% for depressive symptoms (Antúnez & Vinet, 2013; Baader et al., 2014), 20.9% for Anxious symptoms, 15.5% for joint presence of depressive and anxious symptoms (Antúnez & Vinet, 2013), and 5.3% with a moderate to severe risk of committing suicide (Baader et al., 2014).

Considering the relevant studies mentioned above regarding the mental health of university students, we consider it necessary to carry out a study with larger samples, which will bring the data up to date and permit a greater understanding of Chilean university students' mental health. Therefore the main aim of the study was to determine the prevalence rates of mental health problems in undergraduate students according to sex at the Universidad Austral de Chile, during 2015, 2016, and 2017.

Based on research conducted up to the present, we made the following specific hypotheses: H1: The percentages of symptomatology would increase each year between 2015 - 2017. H2: There would be differences in the level of symptoms seen in men and women, with higher levels of symptoms in women. H3: There would be inverse correlations between socioeconomic level, academic performance, and the prevalence of mental health problems.

Method

Participants

The study used a *convenience sampling* in which all undergraduate students at the Universidad Austral de Chile from different degree courses were invited to annually respond voluntarily to an anonymous online questionnaire between 2015 and 2017, meaning that the research is

classified as a non-experimental correlational design of a transversal nature. Of the total university student population in 2015 ($N = 13,652$), 1,772 people responded, 13% of the student population, but the final sample was made up of 1,631 students since we only used surveys which were fully completed. Of the total population of university students ($N = 14,190$) in 2016, 1,635 (11.5%) responded, which gave a final sample of 1,518 students. Of the total population of university students in 2017 ($N = 14,892$) 2498 students responded (16.8%), which gave a final sample of 1707. Table 1 shows the sociodemographic characteristics of the three samples.

Procedure

The research was presented to the ethical committee of the Faculty of Medicine at the Universidad Austral de Chile. Once the study was authorized, the survey process began with questionnaires being released to students via the university's online platform from November each year, between 2015 and 2017. Before responding to the survey, students were informed that their answers would be confidential, anonymous, and only used for scientific purposes. Consequently, every year respondents were issued with a different identification number, in order to ensure complete anonymity. Once consent was given, students voluntarily responded to the questionnaires. After answering each part of the survey, each respondent was given a breakdown of their results in a report automatically generated by the system, which included a description of their results, help guidelines, and directions to access mental health support networks for cases where this was required.

Instruments

Sociodemographic Questionnaire. A sociodemographic questionnaire was constructed to collect basic data including sex, age, university degree, city of origin, general average of university marks, and socioeconomic level, which was measured using quintiles. The quintile corresponds to the official socio-economic measure use in Chile, which qualifies population

Table 1 Sociodemographics of the Samples, Means, and Standard Deviations (SD)

| | | Sociodemographics | | Sociodemographics | | Sociodemographics | |
|---------------------|-----------|-------------------|--------|-------------------|--------|-------------------|--------|
| | | 2015; n=1631 | | 2016; n=1518 | | 2017; n=1707 | |
| Age | Mean (SD) | 21.4 | (2.85) | 21.7 | (3.02) | 23 | (2.56) |
| Sex; n (%) | Female | 959 | (58.8) | 930 | (61.3) | 1028 | (60.2) |
| Quintile; n (%) | 5 | 234 | (12.1) | 162 | (10.7) | 121 | (7.1) |
| | 4 | 294 | (15.2) | 219 | (14.4) | 220 | (12.9) |
| | 3 | 419 | (21.6) | 348 | (22.9) | 351 | (20.6) |
| | 2 | 484 | (25) | 522 | (34.4) | 577 | (33.8) |
| | 1 | 508 | (26.2) | 267 | (17.6) | 438 | (25.6) |
| Grade point average | Above 4.0 | 1354 | (83) | 1259 | (82.9) | 1341 | (78.6) |
| | Less 4.0 | 277 | (17) | 259 | (17.1) | 366 | (21.4) |

SD: Standard Deviations

according to their income. Quintile 1 corresponds to the 20% of the population with the lowest income, and quintile 5 to the 20% with the highest income (Table 1).

Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, & Williams, 2001) is a scale which evaluates depressive symptoms that have been present in the last two weeks, based on the DSM-IV diagnostic criteria. The PHQ is made up of nine items on a Likert scale which are ranked as 0 (*never*), 1 (some days), 2 (more than half of the time), or 3 (*almost every day*), and the scores range from 0 to 27. This investigation used the version validated in Chile by Baader et. al (2012) as well as its ranges of interpretation: the presence of five or more of the nine depressive symptoms with scores greater than or equal to two, and one of the symptoms of depressed mood or anhedonia, indicates a major depressive syndrome. When an individual shows signs of two, three, or four depressive symptoms with scores greater than or equal to two, and one of the symptoms is depressed mood or anhedonia, the scale indicates a moderate depressive syndrome. Finally, the presence of one or two of the depressive symptoms, but without other criteria, indicates a mild depressive syndrome, and an overall value less than two indicates the absence of depression.

Abbreviated Version of Depression Anxiety Stress Scales (DASS - 21) (Lovibond & Lovibond, 1995). This questionnaire was compiled using three small scales which measure depression, anxiety, and stress. It is made up of 21 items in Likert format, with four possible answers per item. This instrument has the advantage of being a scale for self-report, which is short and easy to administrate and respond to, due to its simple nature. This study uses the Chilean version of DASS-21, validated in Chile by Antúnez and Vinet (2012), for the university students. This was used by Román, Santibañez, and Vinet (2016) as a screening instrument for young people between 15 and 24 with clinical problems. In this study, we used the cut off scores suggested by these authors. For the Depression scale, the cut-off score was six; for the Anxiety scale, the cut-off score was five; and for the Stress scale, the cut-off score was six.

The Beck Hopelessness Scale (BHS) (Beck & Weissman, 1974) is a short scale which consists of 20 statements each with two optional answers (true or false). Its application typically takes between five and ten minutes. Items which indicate hopelessness are given one point, and those which are not are classed as zero points. The maximum number of points per survey is 20. Beck and Steer (1989) have proposed the following scale in order to interpret the survey: 0-3 points represent a normal or asymptomatic range, 4-8 points show a mild range, 9-14 points a moderate range, and 15-20 points signal severe hopelessness. It has been noted that a score of higher than nine is a good predictor for eventual suicidal behaviour. This study has adopted the Spanish version of the BHS (Aguilar et al., 1995), which has demonstrated adequate psychometric properties in previous studies carried out in Latin America (Alamo, Baader, Antúnez, Bagladi, & Bejer, 2019; González Cifuentes, 2009; Mikulic, Cassullo, Crespi, & Marconi, 2009).

Revised Restraint Scale (RS) (Herman & Polivy, 1980). Evaluates attitudes towards food, frequency of dieting, worry, and weight fluctuations. The RS consists of ten items on a Likert-type scale and allows for chronic food restriction to be measured. It is also possible to classify individuals as

chronic dieters and non-dieters. The scale has been validated in Chile (Silva, 2010), given that it shows acceptable psychometric properties for use in adolescent groups; therefore, as proposed by Silva (2010), the score of 12 has been used in this study to determine whether or not the students are chronic dieters.

The Functional Social Support Questionnaire (DUKE-UNC-11) (Broadhead, Gehlbach, Degruy, & Kaplan, 1988) is a short scale which consists of 11 items and permits the detection of a grade of perceived social support in two dimensions. The dimension of affective social support refers to those to whom we can communicate intimate feelings. The dimension of the social support of trust refers to the possibility of having relationships with people who express positive feelings of empathy. The questionnaire has a Likert scale, with scores ranging from one (much less than I would like), up to five (just as much as I would like), and, therefore, the total scores range from 11 to 55, with 33 being the cut-off point. The fewer points, the lower the social support perceived. In this study, the version validated in Chile by Rivas-Diez (2013) was used.

Data analysis

The results were analysed using the SPSS programme, version 22. All of the analysis was carried out with a 95% confidence interval. In the first instance, we performed an internal consistency analysis with the Cronbach's Alpha coefficient on all the instruments applied in order to verify the reliability of the questionnaires in the samples used. All scales obtained a Cronbach's Alpha value greater than .80, which indicates good internal consistency of all the scales (DeVellis, 2003). Subsequently, in order to test H1, the authors carried out descriptive analyses of sociodemographic variables, and the results for each sample were obtained according to each instrument applied (see Table 2). Next, in order to test H2, we analysed polynomial contrasts and looked for linear and quadratic trends through ANOVA (Tables 3 and 4), given that this is a comparison of the averages obtained in three large independent samples. Finally, to test H3, correlation analyses were performed with the Pearson r statistic between socioeconomic level, academic performance, and the symptoms of mental health problems (Table 5).

Results

The results indicate that from 2015 to 2017 there has been a sustained increase in the percentage of symptomatology in the questionnaires applied, which is detailed in Table 2.

According to what is reported in the PHQ-9, moderate depression has increased from 17.7% in 2015 to 20.7% in 2017 (3.7% in men and 2.5% in women), whilst the DASS-21 depression scale shows that the percentages of severe depression have increased by 5.2% (8.9% in men and 2.5% in women). Also, according to the DASS-21 results, severe anxiety has increased from 16.7% in 2015 to 26.4% in 2017 (16.5% in men and 4.9% in women) and severe stress has increased from 9.4% in 2015 to 15.9% in 2017 (10.5% in men and 3.8% in women) in the three years that the study details.

According to the results of the Revised Restraint Scale, the risk of having an eating disorder has also increased by 5.7% (13.1% in men and 0.4% in women) over the three

Table 2 Descriptives of the scales in the samples: percentages according to gender

| Mental Health Descriptives | | 2015; n=1631 | | | 2016; n=1518 | | | 2017; n=1707 | | |
|----------------------------|---------------|--------------|------------|------------|--------------|------------|------------|--------------|------------|------------|
| | | % Women | % Men | % Total | % Women | % Men | % Total | % Women | % Men | % Total |
| PHQ-9 | Mild Dep | 207 (21.6) | 150 (22.3) | 357 (21.9) | 173 (18.6) | 117 (19.9) | 290 (19.1) | 191 (18.6) | 142 (20.9) | 333 (19.5) |
| | Moderate Dep | 203 (21.2) | 86 (12.8) | 289 (17.7) | 213 (22.9) | 101 (17.2) | 314 (20.7) | 244 (23.7) | 109 (16.1) | 353 (20.7) |
| DASS-21 | Mild Dep | 294 (30.7) | 173 (25.7) | 467 (28.6) | 281 (30.2) | 167 (28.4) | 448 (29.5) | 349 (33.9) | 209 (30.8) | 558 (32.7) |
| | Severe Dep | 142 (14.8) | 64 (9.5) | 206 (12.6) | 138 (14.8) | 71 (12.1) | 209 (13.8) | 178 (17.3) | 125 (18.4) | 303 (17.8) |
| | Mild Anx | 267 (27.8) | 162 (24.1) | 429 (26.3) | 245 (26.3) | 159 (27) | 404 (26.6) | 286 (27.8) | 187 (27.5) | 473 (27.7) |
| | Severe Anx | 194 (20.2) | 79 (11.8) | 273 (16.7) | 245 (26.3) | 86 (14.6) | 331 (21.8) | 258 (25.1) | 192 (28.3) | 450 (26.4) |
| | Mild Stress | 314 (32.7) | 179 (26.6) | 493 (30.2) | 315 (33.9) | 171 (29.1) | 486 (32) | 364 (35.4) | 236 (34.8) | 600 (35.1) |
| | Severe Stress | 115 (12.0) | 38 (5.7) | 153 (9.4) | 142 (15.3) | 57 (9.7) | 199 (13.1) | 162 (15.8) | 110 (16.2) | 272 (15.9) |
| | ER | TCA Risk | 424 (44.2) | 193 (28.7) | 617 (37.8) | 400 (43) | 183 (31.1) | 583 (38.4) | 458 (44.6) | 284 (41.8) |
| BHS | Mild Risk | 297 (31.0) | 178 (26.5) | 475 (29.1) | 265 (28.5) | 163 (27.7) | 428 (28.2) | 313 (30.4) | 207 (30.5) | 520 (30.5) |
| | Moderate Risk | 96 (10.0) | 70 (10.4) | 166 (10.2) | 120 (12.9) | 92 (15.6) | 212 (14) | 171 (16.6) | 132 (19.4) | 303 (17.8) |
| | Severe Risk | 21 (2.2) | 12 (1.8) | 33 (2.0) | 20 (2.2) | 10 (1.7) | 30 (2) | 38 (3.7) | 25 (3.7) | 63 (3.7) |
| DUKE | Under support | 208 (21.7) | 142 (21.1) | 305 (21.5) | 217 (23.3) | 147 (25) | 364 (24) | 253 (24.6) | 192 (28.3) | 445 (26.1) |

years. Meanwhile, the Beck Hopelessness Scale indicates that hopelessness and the moderate risk of suicide have also significantly increased by 7.6% (9% in men and 6.6% in women), whilst desperation and the severe risk of suicide have increased by 7% (1.7% in men and 1.5% in women) over the course of the study. Additionally, the perception of being able to rely on social support has dropped by 4.6% (3.4% in men and 5.3% in women).

Men and women present significantly different statistics when it comes to the presence of symptoms over the three years studied, which are detailed in tables 3 and 4. Specifically, over the course of the survey, women are significantly more likely to present symptoms of depression, anxiety, and stress.

In 2015, the survey found differences between men and women when it came to depressive symptoms (PHQ-9: $F=17.051$, $p=.000$; DASS-21 Depression: $F=19.092$, $p=.000$), anxiety (DASS-21 Anxiety: $F=29.883$, $p=.000$), stress (DASS-21 Stress: $F=29.883$, $p=.000$), and risk of eating disorders ($F=41.295$, $p=.000$). Women present higher averages in all the symptoms evaluated. In 2016, statistical differences according to the sex of the respondent were also significant when it came to depression (PHQ-9: $F=5.707$, $p=.017$; DASS-21 Depression: $F=3.735$, $p=.053$), anxiety (DASS-21 Anxiety: $F=29.392$, $p=.000$), stress (DASS-21 Stress: $F=18.303$, $p=.000$), and eating disorders ($F=21.803$, $p=.000$). In this sample, women also present higher averages in the aforementioned symptoms. In 2017, there were also differences between the men and women surveyed, specifically in responses regarding hopelessness and the risk of suicide (BHS: $F=15.134$, $p=.000$). In turn, the biggest differences between the sexes concern depression (PHQ-9: $F=10.708$, $p=.001$; DASS-21 Depression: $F=12.732$, $p=.00$), anxiety (DASS-21 Anxiety: $F=55.081$, $p=.000$), stress (DASS-21 Stress: $F=49.439$, $p=.000$), and the risk of eating disorders ($F=52.564$, $p=.000$) (Table 3).

With respect to sociodemographic variables, statistically significant correlations were only found in 2015: specifically between depression as evaluated by the PHQ-9 and academic achievement ($r=-0.72$; $p=.004$). This is defined by a general average above the score of 4.0, which is the grade needed to pass a subject in Chile. There were also relationships between anxiety and academic achievement ($r=-0.104$; $p=.000$), hopelessness and academic achievement ($r=-0.89$; $p=.000$), stress and academic achievement ($r=-0.95$; $p=.000$), and social support and academic achievement ($r=0.82$; $p=.001$). No significant relationships were found between the quintile and the variables evaluated.

In 2016, no significant correlations were found. In 2017, the study found significant correlations between depression as identified by the PHQ-9 and academic achievement ($r=-0.92$; $p=.000$) as well as between diet restriction and academic achievement ($r=0.58$; $p=.017$) (Table 5)

Discussion

The main objective of this study was to determine the prevalence of symptoms related to mental health problems amongst undergraduate students at the university between 2015 and 2017. It was initially hypothesised that the percentages of students showing such symptoms might increase over the course of the study. The data confirms this tendency, demonstrating a sustained increase in all of the variables evaluated. The results of this research are congruent with findings on a global level concerning the prevalence of mental health problems in university student populations. Various studies have reported that more than a third of students experience significant symptoms of anxiety, mood swings, major depressive disorder, and substance abuse (Andrews & Wilding, 2004; Eisenberg, Hunt & Speer, 2013; Leahy et al., 2010). On a national level, studies

Table 3 ANOVA according to sex and scales

| | Sum of Squares | gl | Quadratic Mean | F | Sig |
|------------------------|----------------|----|----------------|--------|------|
| <i>2015</i> | | | | | |
| Sex-PHQ-9 | 10.120 | 1 | 10.120 | 17.051 | .000 |
| Sex-DASS-21 Depression | 9.468 | 1 | 9.468 | 19.092 | .000 |
| Sex-DASS-21 Anxiety | 16.900 | 1 | 16.900 | 29.883 | .000 |
| Sex-DASS-21 Stress | 13.935 | 1 | 13.935 | 32.444 | .000 |
| Sex-ER | 9.484 | 1 | 9.484 | 41.295 | .000 |
| Sex-BHS | .942 | 1 | .942 | 1.646 | .200 |
| Sex-DUKE | .012 | 1 | .012 | .073 | .787 |
| <i>2016</i> | | | | | |
| Sex-PHQ-9 | 3.716 | 1 | 3.716 | 5.707 | .017 |
| Sex-DASS-21 Depression | 1.942 | 1 | 1.942 | 3.735 | .053 |
| Sex-DASS-21 Anxiety | 18.628 | 1 | 18.628 | 29.392 | .000 |
| Sex-DASS 21 Stress | 9.152 | 1 | 9.152 | 18.303 | .000 |
| Sex-ER | 5.091 | 1 | 5.091 | 21.803 | .000 |
| Sex-BHS | .407 | 1 | .407 | .643 | .423 |
| Sex-DUKE | .100 | 1 | .100 | .548 | .459 |
| <i>2017</i> | | | | | |
| Sex-PHQ-9 | 6.944 | 1 | 6.944 | 10.708 | .001 |
| Sex-DASS-21 Depression | 7.236 | 1 | 7.236 | 12.732 | .000 |
| Sex-DASS-21 Anxiety | 36.572 | 1 | 36.572 | 55.081 | .000 |
| Sex-DASS-21 Stress | 25.962 | 1 | 25.962 | 49.439 | .000 |
| Sex-ER | 12.545 | 1 | 12.545 | 52.564 | .000 |
| Sex-BHS | 11.314 | 1 | 11.314 | 15.134 | .000 |
| Sex-DUKE | .250 | 1 | .250 | 1.299 | .255 |

carried out in different Chilean universities indicated high rates of symptoms (Antúnez & Vinet, 2013; Baader et. al., 2014; Barrera, 2019), which were even higher than those found in the general population (Vicente et al., 2002).

However, our study, in particular, shows the permanent prevalence of depression to be a psychopathological phenomenon in university students, which concurs with the review carried out by Ahmed, Shona, Clive, and Cris (2013), which also shows that the figures for this psychopathology are consistently within the highest international ranges. Various studies also suggest that depression is one of the most common mental health problems and the primary cause of disability on a global level. According to data released by the National Health Survey 2016-2017 carried out by the Ministry for Health in Chile (2018), 15.8% of the Chilean population over the age of 18 reported having experienced depressive symptoms in the last year: 'depressive symptoms' referred to feelings of sadness, loss of interest, and difficulty enjoying activities. In turn, 6.2% of Chileans were diagnosed with depression, and there was a significant difference be-

tween the statistics for men and women: 10.1% of women were diagnosed as depressed compared to only 2.1% of men (Ministry for Health in Chile, 2018).

According to our study, rates of depression within the university community are significantly higher than the national rates of depression in adults. As such, depression represents a significant health problem for the university population, in which approximately one in three students will experience a depressive disorder (Ahmed et al., 2013). Another important result was the unmistakable increase in indicators of hopelessness over the three years, which according to Beck and collaborators leads to suicidal ideation and suicide (Beck & Weissman, 1974; Beck, Brown, Berchick, Stewart, & Steer, 1990). This result is concordant with both national and international data, given that suicide is the second leading cause of death for people between the ages of 15 and 19 worldwide and is fast becoming an important public health problem (Mortier et al., 2018; WHO, 2016).

This sustained increase in mental health symptoms of university students in our country could be understood

Table 4 Descriptives of ANOVA: Means and Standard Deviations (*SD*)

| | | 2015; <i>n</i> =1631 | | 2016; <i>n</i> =1518 | | 2017; <i>n</i> =1707 | |
|--------------------|-------|----------------------|-----------|----------------------|-----------|----------------------|-----------|
| | | Mean | <i>SD</i> | Mean | <i>SD</i> | Mean | <i>SD</i> |
| PHQ-9 | Women | .64 | .809 | 1.64 | .829 | .66 | .836 |
| | Men | .48 | .712 | 1.54 | .770 | .53 | .756 |
| | Total | .57 | .774 | 1.60 | .808 | .61 | .808 |
| DASS-21 Depression | Women | .60 | .732 | 1.60 | .733 | .73 | .773 |
| | Men | .45 | .662 | 1.53 | .701 | .60 | .719 |
| | Total | .54 | .708 | 1.57 | .722 | .68 | .756 |
| DASS-21 Anxiety | Women | .68 | .789 | 1.79 | .833 | .91 | .841 |
| | Men | .48 | .697 | 1.56 | .734 | .61 | .767 |
| | Total | .60 | .759 | 1.70 | .804 | .80 | .828 |
| DASS-21 Stress | Women | .57 | .697 | 1.64 | .732 | .76 | .752 |
| | Men | .38 | .591 | 1.48 | .667 | .51 | .674 |
| | Total | .49 | .662 | 1.58 | .711 | .67 | .735 |
| ER | Women | .44 | .497 | 1.43 | .495 | .50 | .500 |
| | Men | .29 | .453 | 1.31 | .463 | .32 | .468 |
| | Total | .38 | .485 | 1.38 | .487 | .43 | .496 |
| BHS | Women | .58 | .759 | 1.61 | .791 | .83 | .894 |
| | Men | .53 | .752 | 1.64 | .804 | .67 | .814 |
| | Total | .56 | .756 | 1.62 | .796 | .77 | .868 |
| DUKE | Women | .78 | .412 | 1.23 | .423 | .73 | .444 |
| | Men | .79 | .409 | 1.25 | .433 | .76 | .430 |
| | Total | .79 | .411 | 1.24 | .427 | .74 | .439 |

based on the socio-political reality that has characterized Chile in recent decades. In recent times, entry to higher education in Chile has greatly increased, and there was a drastic and sustained growth of 85% in the number of enrollments between 2005 and 2019 according to figures provided by the National Council of Education (CNED, 2019). From 2016 onwards, in particular, access to free higher education increased, and by 2018, 60% of the youth population from the most vulnerable socioeconomic group in the country were students, a development which would change the profile of the Chilean student body (CNED, 2019).

But with the increasing number of students comes the increased risk of mental health problems for young people in Chile (Ortiz, López, & Borges, 2007). At the same time, on a public health policy level, Chile seriously under-finances mental health services, especially compared to other OECD countries (Errázuriz, Valdés, Vöhringer, & Calvo (2015). More than a third of the child and adolescent population in Chile will present some form of psychiatric disorder, and the majority do not receive care. There is a 66.6% healthcare gap for any type of mental health disorder in this group (Vicente et al., 2012). As the evidence suggests,

this indicates that when many young people start university they have already experienced a mental health problem in childhood or adolescence, (Auerbach et. al., 2018).

The second hypothesis in this study was that there might be differences in the levels of symptoms presented based on sex. The data supports this hypothesis, since the averages for each variable evaluated are significantly higher for women, with one exception being the perception of social support, which showed similar data for men and women. Women present higher rates of mental health problems in this study, which is what has been found in similar studies on an international level (Bruffaerts et al., 2018; Castillo & Schwartz, 2013; Eisenberg et al., 2013; Hubbard et al., 2018; Ibrahim et al., 2013; January et al., 2018), as well as the Chilean national level (Antúnez & Vinet, 2013; Baader et. al., 2014). Explanations for this phenomenon range from the argument that women are more susceptible to mental health problems due to hormonal fluctuations that are part of their physiology (Gitay et al. 2018), to findings which suggest that women are more open to expressing their psychological distress and seeking help (Hubbard et al., 2018). Nevertheless, one interesting finding is that male participants

Table 5 Correlation matrix for the variables in the study

| 2015; n=163 | | Academic Achiev. | Quintile | PHQ-9 | DASS-21 Depression | DASS-21 Anxiety | DASS-21 Stress | ER | BHS | DUKE |
|------------------|---------------------|------------------|----------|---------|--------------------|-----------------|----------------|-------|---------|--------|
| Academic Achiev. | Pearson correlation | 1 | .033 | -.072** | -.064** | -.104** | -.095** | -.021 | -.089** | .082** |
| | Sig. (2-tailed) | | .180 | .004 | .010 | .000 | .000 | .399 | .000 | .001 |
| Quintile | Pearson correlation | | 1 | .014 | -.004 | -.021 | -.027 | .006 | .046 | .008 |
| | Sig. (2-tailed) | | | .580 | .886 | .386 | .271 | .815 | .064 | .744 |
| 2016; n=1518 | | Acad. Achiev. | Quintile | PHQ-9 | DASS-21 Depression | DASS-21 Anxiety | DASS-21 Stress | ER | BHS | DUKE |
| Acad. Achiev. | Pearson correlation | 1 | -.029 | .009 | .008 | .026 | .011 | -.020 | .019 | .037 |
| | Sig. (2-tailed) | | .204 | .716 | .748 | .306 | .663 | .439 | .473 | .178 |
| Quintile | Pearson correlation | | 1 | -.006 | .015 | .003 | .004 | -.025 | -.004 | .008 |
| | Sig. (2-tailed) | | | .780 | .517 | .902 | .870 | .309 | .886 | .737 |
| 2017; n=1707 | | Acad. Achiev. | Quintile | PHQ-9 | DASS-21 Depression | DASS-21 Anxiety | DASS-21 Stress | ER | BHS | DUKE |
| Acad. Achiev. | Pearson correlation | 1 | .020 | -.092** | .024 | -.017 | -.015 | .058* | .013 | .028 |
| | Sig. (2-tailed) | | .417 | .000 | .327 | .494 | .536 | .017 | .589 | .249 |
| Quintile | Pearson correlation | | 1 | -.007 | .009 | .023 | .006 | -.030 | .004 | .013 |
| | Sig. (2-tailed) | | | .787 | .714 | .341 | .802 | .219 | .881 | .593 |

Note. **The correlation is significant at the 0.01 level (2 tails). *The correlation is significant at the 0.05 level (2 tails).

present the highest increase in levels of symptomology over the three years. This may be due to the fact that the survey used scales requiring each item to be given a complete answer, meaning that those who responded fully are likely to be more aware of their own mental health. This potentially indicates a change in men and might suggest that there is currently greater openness and awareness when recognising one's own mental health problems and seeking help. The growing tendency of depression in male students is, without a doubt, an interesting area for future study.

A third hypothesis was that there would be a link between the socioeconomic standing of the participant, their academic achievement, and the prevalence of mental health problems. This relationship can only be partially backed up by the data since the study found no significant links between socioeconomic level and the other variables. Only links between academic achievement and other variables could be found, including depression, anxiety, stress, and low perception of social support. Even if this study cannot confirm the exact nature of these relationships, authors such as Ketchen and Eisenberg (2017) have posited that mental health problems can be significant predictors of academic dissatisfaction and dropout, whilst positive mental health is a good predictor of satisfaction and persistence. Specifically, in the case of Chile and the Universidad Austral, it might be that this new student profile (CNED, 2019) has motivated universities to implement levelling strategies and academic support (Gil-Llambías, del Valle, Villarroel & Fuentes, 2019).

Moreover, Hefner and Eisenberg (2009) report that within the university population, a low quality of social support can lead to students experiencing mental health problems. By the same logic, high-quality social support can be a

mediating factor for stress. There is also evidence that the stress caused by interpersonal conflicts can precede a suicide attempt (Hagedorn & Omar, 2002), and consequently, social support can moderate depressive symptoms and suicidal ideation, avoiding the potentially negative link between these variables and, therefore, protecting young people from such pathologies (Lamis, Ballard, May, & Dvorak, 2016; Rivera & Andrade, 2006). This study has observed a gradual decline in the perception of social support in university students, which could likely lead to mental health problems, as evidenced by the increasing statistics in the survey and it is raised by some studies (Fernández, Daset, & Castelluccio, 2019; Schnettler et al., 2019). Undoubtedly, the perception of social support is a variable to be considered in future studies, due to the factors including the relevance that this might have when designing prevention strategies.

This study has found no significant connections between socioeconomic level and mental health problems, which is congruent with recent studies which posit that mental health pathologies in students cross over different socioeconomic boundaries and are found widely throughout the university population (Auerbach et al., 2018; Rossi et al., 2019).

Undoubtedly, these results are representative of a global phenomenon which accounts for the complex stage of transition students face and the effect that psychosocial stresses might have on their mental health. Clearly, mental health problems in students present a complex challenge for universities, and treating and preventing them will require a collective effort from university communities (Greenbaum, 2018; Pedrelli et al., 2015; Zivin et al., 2009).

Therefore, one particular strength of this study is that it allows us to access a large sample of students over three

years, with an accessible response modality for young people, which has made it possible to raise awareness about the importance of mental health and inform people about the support networks available. Moreover, this research has helped psychologists at the university to know where to direct their efforts to support students in their mental health and to prevent the future emergence of pathology. Specifically, this research contributes to the understanding of the phenomenon of university students' mental health and the variables associated with it such as academic performance and social support. It expands the evidence available in this area in Chile and Latin America.

One limitation of this study would be that it is not longitudinal, that is to say, that the results should not be understood as a monitoring of the levels of symptomatology amongst the students themselves. Likewise, given that over the three years the study used different scales to measure the consumption of alcohol, marijuana and other drugs, these results could not be used, despite their relevance.

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