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Article

Problematic Internet Use, Depressive Symptomatology and Suicidal Ideation in University Students During COVID-19 Confinement

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ABSTRACT

Background: The aim was to estimate the rate of PIU in Spanish university students during the lockdown, taking sex and age into account, and to analyze its relationship with depression and suicidal ideation. **Method:** 921 university students (55% women) from 18 to 30 years old (M = 24.8 years; SD = 3) participated. **Results:** The results showed that 21% of the participants presented PIU, 25.1% moderate depression, 2.1% severe depression, and 6.6% suicidal ideation. The 18 to 21-year-old age group presented the highest rate of PIU (37.8%). A positive correlation was observed between PIU and depression (r = .38; p < .001), with a significantly higher mean score on the PHQ-9 ($t_{(241.813)}$ = -8.21; p < .001; d = .78) in university students with PIU (M = 9.8; SD = 5.1) than those without it (M = 6.4; SD = 4.1). The rate of severe depression was six times greater ($\chi^2_{(3)}$ = 73.25; p < .001) in undergraduates with PIU (6.2%) than those without PIU (0.8%). Moreover, 3.6% of university students with PIU presented suicidal ideation. **Conclusions:** These findings establish the association between PIU and depression and suicidal ideation in the university population, providing novel contributions for prevention policies.

Uso Problemático de Internet, Sintomatología Depresiva e Ideación Suicida en Universitarios Durante el Confinamiento por COVID-19

Palabras clave:
Uso problemático de Internet
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RESUMEN

Antecedentes: El objetivo fue estimar la tasa de PIU en universitarios españoles durante el confinamiento, considerando sexo y edad, y analizar su relación con depresión e ideación suicida. **Método:** Participaron 921 estudiantes universitarios (55% mujeres) de 18 a 30 años (M = 24.8 años; SD = 3). **Resultados:** Los resultados mostraron que el 21% presentaron PIU; 25.1% depresión moderada; 2.1% depresión severa; y 6.6% ideación suicida. El grupo de 18 a 21 años presentó la mayor tasa de PIU (37.8%). Se observó una correlación positiva entre PIU y depresión (r = .38; p < .001), con una puntuación media significativamente mayor en el PHQ-9 ($t_{(241.813)}$ = -8.21; p < .001; d = .78) en universitarios con PIU (M = 9.8; SD = 5.1) frente a los que no la tienen (M = 6.4; SD = 4.1). La tasa de depresión severa fue seis veces mayor ($\chi^2_{(3)}$ = 73.25; p < .001) en los universitarios con PIU (6.2%) en comparación con los que no tenían PIU (0.8%). El 3.6% de los universitarios con PIU presentó ideación suicida. **Conclusiones:** Estos hallazgos establecen la asociación entre PIU y depresión e ideación suicida en población universitaria, brindando aportes novedosos para las políticas de prevención.

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In 2020, due to the global pandemic caused by the SARS-CoV-2 virus, millions of people found themselves confined to their homes in an unprecedented situation. The measures taken to curb the spread of Covid, fear of the disease, and uncertainty about its consequences, had an impact on the mental health of the population worldwide (Huang & Zhao, 2020; Shigemura et al., 2020; Torales et al., 2020). The most frequent psychological repercussions were sleep disorders, feelings of loneliness, sadness, fear, panic, anxiety, or depression (Ahorsu et al., 2022; Banerjee, 2020; Huang & Zhao, 2020; Islam, Ferdous et al., 2020; Qiu et al., 2020; Salari et al., 2020; Schimmenti et al., 2020).

Home confinement and social distancing measures led to a significant increase in the use of Internet-based technological devices to maintain communication and reduce social isolation, fulfill work responsibilities through teleworking, shop, provide entertainment, or pursue academic studies (World Health Organization, 2020). In fact, one of the measures implemented was the suspension of face-to-face classes in universities, transferring all teaching to an online format (García-Peñalvo et al., 2020).

In the study by Sun et al. (2020) carried out during the COVID-19 pandemic, 46.8% of the participants reported being more dependent on Internet use, and 16.6% had increased the number of hours they spent online. In this regard, it should be noted that using the Internet daily increases the risk of Problematic Internet Use (PIU) up to six times, and spending five hours a day online quadruples the risk (Mamun & Griffiths, 2019; Vigna-Taglianti et al., 2017).

PIU refers to behaviors that can cause problems related to the Internet, whose use can become dysfunctional and have serious effects on people's well-being, especially in young adults (Machimbarrena et al., 2019). In addition, there is evidence that college students are a high-risk group for the development of PIU (Afrin et al., 2017; Frangos et al., 2010; Islam & Hossin, 2016; Pettorruso et al., 2020; Polo del Rio et al., 2017; Rodrigues et al., 2020; Shadzi, et al., 2020; Uddin et al., 2016; Young, 2004). Before confinement, PIU prevalence rates varied across studies, from 14.3% to 54.9% (Islam & Hossin, 2016; Kitazawa et al., 2019; Laconi et al., 2014; Ramón-Arbués et al., 2020; Shadzi et al., 2020; Uddin et al., 2016; Tateno et al., 2018). During confinement, Hassan et al. (2020) found PIU levels of around 27.1% in young adults. Oka et al. (2021) indicate a PIU prevalence of 7.8% before the pandemic, which increased 1.6 times in young people during the pandemic. In contrast, Islam, Sujan et al. (2020) indicate that those who used the Internet for a greater amount of time during confinement were not associated with this increase in PIU. These authors found that college students used the Internet more as a resource to cope with a lack of personal relationships and leisure time or to combat feelings of loneliness and isolation.

Moreover, it is estimated that the university population has a higher risk of experiencing depressive symptoms at some time in their lives compared to the average of the world population (Gavurova et al., 2020). Studies in university population offer percentages of students with depressive symptomatology from 18.4% to 62.9% (Gavurova et al., 2020; Islam, Sujan et al., 2020; Kitazawa et al., 2019; Ma et al., 2020; Ramón-Arbués et al., 2020; Wang et al., 2020; Wathelet et al., 2020; Zhang et al., 2018). Women students tend to present higher levels of depression (Apaza et al., 2020; Gavurova et al., 2020; Granados et al., 2020), and men greater suicidal behavior (Granados et al., 2020); although other studies (Barrera-Herrera et al., 2019) did not find any sex differences.

Within the classification of depression, mild, moderate, and severe symptomatology can be found. However, at all levels, depression will tend to produce modifications in the individual's performance in all the areas of adjustment, which also occurs with PIU. In fact, several studies with university populations have shown the association between PIU and depression (Aznar-Díaz et al., 2020; Balhara et al., 2019; González & Estévez, 2017; Kitazawa et al., 2019; Lin et al., 2016; Odaci & Çikrici, 2017; Ramón-Arbués et al., 2020; Rodrigues et al., 2020; Starcevic & Khazaal, 2017; Ueno et al., 2020) and suicidal ideation (Cheng et al., 2018; Kim et al., 2006). Likewise, it has been concluded that the most relevant factor associated with PIU is depressive and anxious symptoms (Balhara et al., 2019; Starcevic & Khazaal, 2017). Nevertheless, there is also evidence that PIU predicts the development of depressive symptoms and suicide attempts (Kim et al., 2006), with a risk of depressive symptoms 2.5 times greater than in those who do not present PIU (Lam & Peng, 2010).

Suicidal behavior refers to a variety of manifestations, ranging from suicidal ideation and planning, through suicidal communication to suicide attempts and completed suicide (Al-Halabí & Fonseca-Pedrero, 2021). Its relationship with maladaptive internet use has been confirmed in the adolescent population (Bousoño et al., 2017). However, there are no known studies in this regard in the Spanish university population.

Several studies (Gavurova et al., 2020; Restrepo et al., 2018; Zhang et al., 2018) associate academic stress with depression in the university population, and so an increase in the percentage of students with depressive symptoms during confinement, compared to before it, would be expected. This could produce a feedback effect between depression and PIU, given that some studies (Blasi et al., 2019; Deleuze et al., 2019; Gupta et al., 2018; Odaci & Çikrici, 2017) point out that students with depressive symptomatology use the Internet as a mechanism for avoiding problems and negative feelings. In fact, a study with university students during confinement (Servidio et al., 2021) indicates that depression is directly related to Internet addiction, and that this association is characterized by mutual feedback between the two variables.

The aim of this study was: (1) to estimate the rate of Problematic Internet Use (PIU) among Spanish university students during confinement due to COVID-19, focusing on sex and age; and (2) to analyze PIU's relationship with depressive symptomatology and suicidal ideation.

Method

This study is descriptive and non-probabilistic, and it uses convenience sampling. A battery of online surveys was used to collect and evaluate the variables under study. Age ranges were established based on those that showed adequate Internet access, as stated in the Equipment and Use of Information and Communication Technologies at Home Survey (INE, 2019).

Participants

The initial sample included 1355 participating university students corresponding to 17 autonomous regions and the two Spanish autonomous cities. Of this initial sample, 434 (10.3%) were removed because of missing values, incoherent response patterns, or being outside the established age range (18-64 years

old). The final sample contains data from 921 university students (55% women; 45% men), with ages between 18 and 30 years and an average age of 24.8 years (SD = 3); 29.5% (n = 272) worked and studied during confinement, while 70.5% (n = 649) only studied.

Instruments

The sociodemographic variables considered were: a) sex (men, women); b) age (18-21 years, 22-25 years, and 26-30 years).

Depression was evaluated with PHQ-9 (Patient Health Questionnaire) (Johnson et al., 2002; Spitzer et al., 1999), in the Spanish adaptation by (Diez-Quevedo et al., 2001). It consists of 9 items with Likert-type response values between 0 and 3 (0 = "never"; 1 = "some days"; 2 = "more than half of the days"; 3 = "almost every day"), referring to the past two weeks. Item 9 refers to suicidal ideation ("Thoughts that I would be better off dead or of harming myself in some way"). The scores are added together, and a total score between 0 and 27 is obtained. The cut-off points (Kroenke et al., 2001) are 0-4: minimal depression; 5-9: mild depression; 10-14: moderate depression; 15-19: moderately severe depression; and 20-27: severe depression. Type of administration: self- applied. Time of administration: less than 5 minutes. In this study, α PHQ-9 = .82.

Problematic Internet Use (PIU) was evaluated with the EUPI-a (Problematic Internet Use scale for teenagers by (Rial et al., 2015). It consists of 11 items that refer to the past 30 days, with Likert-type response values between 0 and 4 (0 = "nothing agreed"; 1 = "kind of agree"; 2 = "something agreed"; 3 = "quite agreed"; 4 = "totally agreed"). The scores are added up, and a total score between 0 and 44 is obtained. The cut-off point for setting PIU is 16. α = .82. Sensitivity = 81%. Specificity = 82.6%. Type of administration: self-applied. Time of administration: less than 5 minutes. This scale has been chosen mainly because, although literature warns that the PIU is not an exclusive phenomenon for young people and adolescents, currently in Spain there are no scales developed and validated specifically to evaluate it in adult population. The use of a different scale, without a minimum of psychometric guarantees, would have been a major limitation. Table 1 shows the descriptive statistics of the EUPI-a scale obtained for the sample in this study. Items get a high corrected homogeneity index (IHC). In this study, α de Cronbach = .85 and McDonald's Omega coefficient = .81. Therefore, despite the fact that this scale was initially created to evaluate PIU in adolescents, these good psychometric properties allow to estimate the rate of PIU in university students with ages between 18 and 30 years.

The frequency of Internet use before and during confinement due to COVID-19 was measured with the question "How often do you connect to the Internet through any device (cell phone, computer, tablet, etc.)?", with the following response options: (1) Never or almost never; (2) A few times a month; (3) A few times a week; (4) Every day or almost every day. Average daily Internet use was measured with the question "Throughout the day, how much time do you usually use the Internet?", with the following response options: (1) Less than 1 hour; (2) Between 1 and 2 hours; (3) Between 2 and 3 hours; (4) Between 3 and 5 hours; (5) More than 5 hours; and (6) All day. Finally, we asked about the frequency of Internet, cell phone, or tablet use after 12 midnight, with the following response options: (1) Never or almost never; (2) A few times a month; (3) A few times a week; (4) Every day or almost every day.

Table 1.
Descriptive statistics of the EUPI-a.

Items	Average	SD	IHC
When I'm online I feel that time flies and hours pass without me realizing it	2.1	1.1	.85
I've sometimes tried to control or reduce my Internet use, but I couldn't	1.1	1.1	.84
I've sometimes even managed to neglect certain tasks or perform below par (in exams, sport, etc.) because I put connecting to Internet first	1.1	1.2	.83
I'm starting to like more and more spending hours connected to Internet	1	1	.83
I sometimes get irritated or in a bad mood because I can't connect to Internet or because I have to disconnect	0.7	1	.83
I prefer that my parents don't know how long I spend online because they would think it was too much	0.5	1	.83
I've stopped going to places or doing things that interested me before so as to connect to the Internet	0.3	0.7	.84
I've sometimes got into trouble because of the Internet	0.2	0.6	.84
It annoys me to spend hours without connecting to Internet	0.5	0.9	.83
When I can't connect I can't stop thinking that I might be missing something important	0.4	0.8	.83
I say or do things on Internet that I wouldn't be capable of saying/doing in person	0.5	0.9	.84

Procedure

Data collection started on April 14, 2020, after the first 30 days of confinement measures, and it ended on May 29th, when the de-escalation measures started. The data collection strategy was based on a survey hosted on a website, posts on social media, and advertisements via e-mail and smartphone messaging applications. Participants were informed that participation was voluntary, in accordance with the Spanish Organic Law 3/2018 on Personal Data Protection and Digital Rights Guarantee (2018). They were asked to give their consent to participate. Selection criteria were: a) age between 18 and 30 years; b) explicit agreement to participate; and c) properly filling out the survey.

Data analysis

Data analysis was performed with the IBM SPSS Statistics for Windows, version 25 (IBM Corp., Armonk, N.Y., USA) for all analyses except to calculate McDonald's Omega that was carried out with The jamovi project (2022) for Windows version 2.3.9. As a first step, the sample was weighted as a balancing strategy. Next, a frequency analysis and a chi-squared test were performed for intragroup differences (disaggregated by sex and age) in the prevalence of connection frequency, daily Internet connection time, and going online after midnight before the pandemic and during the COVID-19 confinement. To analyze the differences in each of the three variables of Internet use habits before and during confinement, the Wilcoxon Z test was used and Cohen's d to calculate the effect size of all the differences found.

In addition, frequency analysis and the chi-squared test were also performed for intragroup differences (disaggregated by sex and age) in the prevalence of PIU, the PHQ-9, and suicidal ideation.

For the comparison of means on the PHQ-9 between the groups with and without PIU, Student's t-test was applied, after checking compliance with the assumptions of normality (Kolmogorov-Smirnov) and homoscedasticity (Levene's assumption of equality of variances). A correlation analysis was also carried out (Pearson's bivariate correlation for metric variables and Spearman's order correlation for ordinal variables). Finally, univariate and multivariate logistic regression analyses, adjusted for sex, age, and level of depression, were performed to predict PIU.

Results

Before the pandemic, 31.1% (n = 265) of the university students connected to the Internet after midnight every day or almost every day, increasing to 52.5% (n = 441) during confinement; that is, the rate increased 1.69 times. Regarding daily Internet connection time, there was a significant increase during confinement (M = 4.8, SD = 1.1), compared to before it (M = 3.9, SD = 1.1) (Z = -20.47; p < .001, d = .78), increasing from about three hours to almost five hours on average. Specifically, the percentage of university students who were online more than five hours a day or all day was 1.79 times greater during confinement (Table 2).

Focusing on sex, there was a significant increase in the daily time spent online during confinement (M_{women} = 4.8, SD = 1.1; M_{men} = 4.8, SD = 1.1), compared to before it (M_{women} = 3.9, SD = 1.3; M_{men} = 4.1, SD = 1.3), in both men (Z = -11.35; p < .001, d = .77) and women (Z = -17.09; p < .001, d = .81). Furthermore, the percentage of university students who were online more than five hours a day or all day before the pandemic was higher in men (42.2%) than in women (31.5%), and the differences were statistically significant ($\chi^2_{(5)}$ = 20.78; p < .001). However, during confinement, the percentages of men (66.2%) and women (64.2%) became balanced ($\chi^2_{(2)}$ = 4.71; p = .453) (Table 2).

When age was examined (Table 2), there was also a significant increase in the daily Internet connection time during confinement ($M_{18\text{-}21\ years}$ = 4.8, SD = 1.1; $M_{22\text{-}25\ years}$ = 4.9, SD = 0.99; $M_{26\text{-}30\ years}$ = 4.6, SD = 1.2) compared to before it ($M_{18\text{-}21\ years}$ = 4, SD = 1.1; $M_{22\text{-}25\ years}$ = 4.0, SD = 1.3; $M_{26\text{-}30\ years}$ = 3.8, SD = 1.4), in the groups from 18 to 21 years old (Z = -6.93; p < .001, d = .77), from 22 to 25 years old (Z = -14.61; p < .001, d = .81), and from 26 to 30 years old (Z = -12.63; p < .001, d = .73). When comparing the three age groups, the percentage of men university students who connected to the Internet more than five hours a day or all day before the pandemic was higher in the group from 22 to 25 years old (40.8%), compared to the groups from 18 to 21 (24.7%) and 26 to 30 years old (34.4%) ($\chi^2_{(10)}$ = 40.83; p < .001); and the same pattern was found during confinement (18-21 years old = 68.1%; 22-25 years old = 70.1%; 26-30 years old = 58.6%) ($\chi^2_{(10)}$ = 47.32; p < .001).

Table 2.
Percentage of university students according to their Internet use habits before and during confinement by sex and age.

	Overall % (n)		Sex				Age					
			Women % (n)		Men % (n)		18-21 % (n)		22-25 % (n)		26-30 % (n)	
	BC	DC	BC	DC	BC	DC	BC	DC	BC	DC	BC	DC
Frequency of connection												
Never or almost never	0.4 (3)	0.3 (2)	0.1 (1)	0	0.2 (2)	0.2 (2)	0	0	0	0	0.4 (3)	0.2 (2)
A few times a month	0.3 (2)	0.1 (1)	0	1 (1)	0.2 (2)	0	0.2 (2)	0	0	0	0	0.1 (1)
A few times a week	2.1 (18)	1 (9)	0.7 (6)	0.5 (4)	1.4 (12)	0.6 (5)	0.4 (3)	0.6 (5)	0.8 (7)	0	1 (8)	0.4 (3)
Every day or almost every day	97.3 (818)	98.6 (829)	53.4 (449)	451 (53.6)	43.9 (369)	4.49 (378)	11.1 (93)	11.1 (93)	47.3 (398)	48.1 (404)	38.9 (327)	39.5 (332)
Connection time/ day												
Less than 1 hour	1.8 (16)	0.4 (4)	2.4 (11)	0.2 (1)	1.3 (5)	0.5 (2)	0	0	2 (8)	0	2.4 (8)	1.2 (4)
Between 1-2 hours	14.5 (122)	4.1 (34)	13 (61)	3.5 (16)	15.6 (60)	4.9 (19)	10.3 (10)	10.3 (10)	10.4 (42)	1 (4)	20.4 (69)	5.9 (20)
Between 2-3 hours	21.2 (178)	9.4 (79)	25.9 (118)	10.8 (49)	15.6 (60)	7.8 (30)	24.7 (24)	1 (1)	20.3 (82)	8.4 (34)	21.3 (72)	12.7 (43)
Between 3-5 hours	26.1 (220)	20.9 (176)	26.8 (122)	21.3 (97)	25.3 (97)	20.5 (79)	40.2 (39)	20.6 (20)	26.5 (107)	20.5 (83)	21.6 (73)	21.6 (73)
More than 5 hours	21.6 (182)	36.3 (306)	17.5 (80)	34.5 (157)	26.6 (102)	38.4 (148)	13.4 (13)	45.4 (44)	27.2 (110)	38.9 (157)	17.5 (59)	30.8 (104)
All day	14.8 (124)	28.8 (242)	14 (64)	29.7 (135)	15.6 (60)	27.8 (107)	11.3 (11)	22.7 (22)	13.6 (55)	31.2 (126)	16.9 (57)	27.8 (94)
Connecting after 12 midnight												
Never or almost never	28 (235)	16.2 (137)	17.5 (147)	9.6 (81)	10.5 (88)	6.7 (56)	2.5 (21)	1 (8)	11.4 (96)	5.7 (48)	14.4 (119)	9.5 (80)
A few times a month	14.3 (120)	9 (76)	7.4 (62)	4.6 (39)	6.9 (58)	4.4 (37)	1.5 (13)	0.7 (6)	6.9 (58)	2.9 (24)	48 (5.7)	5.5 (46)
A few times a week	26.7 (224)	22.2 (187)	14.3 (120)	11.8 (99)	104 (12.4)	10.5 (88)	3.9 (33)	2 (17)	13.3 (112)	11.4 (96)	79 (9.4)	8.8 (74)
Every day or almost every day	31.1 (262)	52.2 (441)	15.1 (127)	28.2 (237)	16.1 (135)	24.3 (204)	3.7 (31)	8 (67)	16.5 (139)	28.2 (237)	10.9 (92)	16.3 (137)

Note. BC = Before confinement; DC = During confinement.

As Table 3 shows, 21% of the university students surveyed presented PIU during the COVID-19 confinement. Based on sex, no statistically significant differences were found ($\chi^2_{(1)} = 2.32$; p = .128). In terms of age, the 18 to 21 age group had the highest percentage of PIU (37.8%), followed by the 22 to 25 age group (22%) and the 26 to 30 age group (15.3%), with significant differences between these groups ($\chi^2_{(2)} = 23.42$; p < .001) (Table 4).

In the case of depression, 45% of the university students surveyed had mild depression, 25.1% had moderate depression, and 2.1% had severe depression. In addition, 6.6% presented suicidal ideation (4% in women and 2.5% in men). In terms of sex, the prevalence of depression was higher in women than in men ($\chi^2_{(1)} = 31.83$; p < .001). However, no significant differences between men and women were found in the presence of suicidal ideation ($\chi^2_{(1)} = 1.17$; p = .279). Based on age, no statistically significant differences were found in the prevalence of depression ($\chi^2_{(2)} = 7.93$; p = .244), but there were differences in the presence of suicidal ideation, with the group from 22 to 25 years old presenting a higher prevalence, followed by the group from 26 to 30 years old and, finally, the group from 18 to 21 years old ($\chi^2_{(2)} = 8.19$; p = .017) (Table 4).

Regarding the association between PIU and depression, a positive correlation was observed between these two variables (r = .38; p < .001), with a significantly higher mean score on the PHQ-9 ($t_{(241.813)} = -8.21$; p < .001; d = .78) in the university students with PIU (M = 9.8; SD = 5.1), compared to those without PIU (M = 6.4; SD = 4.1). Likewise, the rate of severe depression was six times higher ($\chi^2_{(3)} = 73.25$; p < .001) in university students with PIU (6.2%) than in those who did not present PIU (0.8%).

If the two axes are interchanged in the analysis, it can be observed that the rate of PIU increases progressively as a function of the level of depression according to the PHQ-9. PIU is present in 18.6% of the university students with a mild level of depression, 37.9% with a moderate or moderately severe level of depression, and 68.8% of those who report a severe level of depression (Table 5, Figure 1). Similarly, the correlation between PIU and suicidal ideation, although moderate, is statistically significant (r = .21; p < .001). In addition, 3.6% of the university students with PIU present suicidal ideation.

The logistic regression analysis (Table 6) revealed two noteworthy issues. First, the sex variable is relevant, with men university students presenting a 1.81% (95% CI: 1.25-2.61) higher risk of developing PIU than women. Second, the level of depression among university students is a risk factor for the development of PIU. The greater the degree of depressive symptomatology, the higher the risk of PIU. University students with severe depression had a 23.39% (95% CI: 7.32-74.71) greater risk of developing PIU, whereas those with moderate depression had a 6.46% greater risk (95% CI: 3.77-11.07) and those with mild depression had a 2.23% greater risk (95% CI: 1.34-3.72).

Table 3.
Prevalence of PIU during confinement for the entire sample and by sex and age.

	Overall % (n)	Sex % (n)		X^2	Age % (n)			X^2
		Women	Men		18-21	22-25	26-30	
PIU	21.1 (178)	19.1 (87)	23.4 (90)	2.32	37.8 (37)	22 (89)	15.3 (52)	23.42***

Note. ***p < .001.

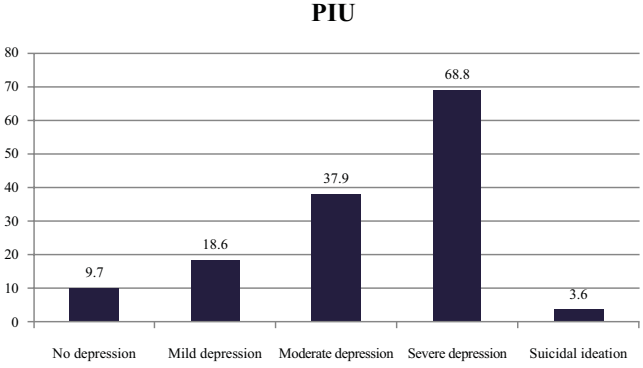

Figure 1.
Prevalence (%) of PIU according to the level of depression and suicidal ideation.

Table 4.
Prevalence of depression in the entire sample and by sex and age.

PHQ-9	Overall % (n)	Sex % (n)		X^2	Age % (n)			X^2
		Women	Men		18-21	22-25	26-30	
No depression	27.7 (248)	11.6 (104)	16.1 (144)	31.83***	3.4 (30)	11.5 (103)	12.7 (114)	7.93
Mild depression	45 (404)	25.9 (232)	19.2 (172)		4.7 (42)	22.8 (204)	17.7 (158)	
Moderate depression	25.1 (225)	16.9 (151)	8.3 (74)		3.2 (29)	12.5 (112)	9.4 (84)	
Severe depression	2.1 (19)	1.3 (12)	0.8 (7)		0.4 (4)	0.9 (8)	0.8 (7)	
Suicidal ideation	6.6 (60)	4 (37)	2.5 (23)	1.17	1.5 (14)	2.7 (25)	2.4 (22)	8.19*

Note. ***p < .001; *p < .05.

Table 5.
Prevalence of PIU depending on the level of depression.

	PHQ-9 % (n)				X^2	PHQ-9 % (n)	X^2
	No depression	Mild depression	Moderate depression	Severe depression		Suicidal ideation	
PIU	9.7 (23)	18.6 (69)	37.9 (75)	68.8 (11)	73.25**	3.6 (30)	39.39***

Note. ***p < .001.

Table 6.
Logistic regression models to predict PIU.

		PIU	
		Univariate POR (95% CI)	Multivariate[1] POR (95% CI)
Sex	Women	1	1
	Men	1.3 (0.93-1.81)	1.81 (1.25-2.61)
Age		0.89 (0.84-0.94)	0.90 (0.85-0.96)
PHQ-9	No depression	1	1
	Mild depression	2.09 (1.26-3.45)	2.23 (1.34-3.72)
	Moderate depression	5.57 (3.32-9.33)	6.46 (3.77-11.07)
	Severe depression	20.74 (6.69-64.32)	23.39 (7.32-74.71)

Note. POR = Prevalence of Odds Ratio; CI= confidence interval; [1]Adjusted for the other independent variables included in the column.

Discussion

The aim of this study was to estimate the rate of PIU in Spanish university students during the COVID-19 confinement and analyze its relationship with depression and suicidal ideation. The scarcity of studies on both problems, taking into account sex and age differences, makes this a referential study.

During confinement, the greatest change was observed in the rate of those who connected to the Internet more than five hours a day or all day, which was multiplied by 1.79 in both men and women and in the three age ranges (18-21 years; 22-25 years; 26-30 years). This finding can be explained to some extent by the change from face-to-face to online university teaching, although this occurred in a limited way. Other possible explanations, would be the search for social interaction through social networks (Islam, Sujan et al., 2020; Rodrigues et al., 2020) to compensate for the limitations imposed by the confinement measures and the restrictions on mobility and social contact.

Other relevant findings are the 1.69-fold increase in the number of university students who connected to the Internet after midnight every day or almost every day, in line with Rodrigues et al. (2020) indications about the preference for going online at night. We also found that, before confinement, there were significant differences in the number of men and women who spent more than five hours a day or all day online. This number was higher in men before the lockdown, but the differences disappeared during it.

Regarding the prevalence of PIU during confinement, a rate of 21% was found for the sample of university students. This figure is close to what was reported by other studies with university populations, which placed it between 21 and 27% (Hassan et al., 2020; Islam, Sujan et al., 2020; Ramón-Arbués et al., 2020; Tateno et al., 2018). The novelty of the present study is that it shows that the percentage of PIU can vary according to age and the presence and severity of depressive symptomatology.

In relation to age, in the 18 to 21 age range, the prevalence of PIU reached 37.8%, 1.8 times higher than the prevalence in the overall sample. In the 22 to 25 age range, the rate of PIU was 22%, and for the 26 to 30 age range, it was 15.3%. This finding suggests that there may be differential patterns of Internet use among the different age groups. It would also explain the variability in the rates reported in different studies.

In relation to the levels of depression in university students during the COVID-19 confinement period, 45% were mildly depressed, 25.1% were moderately depressed, and 2.1% were severely depressed. Other studies report rates ranging from 18.4% to 54.5% (Gavurova et al., 2020; Kitazawa et al., 2019; Ma et al., 2020; Ramón-Arbués et al., 2020; Wang et al., 2020; Wathelet et al., 2020; Zhang et al., 2018). The relevance of our finding is that the rates of depressive symptomatology are presented according to different levels of depression. Focusing on sex, regardless of the level of depression, it was higher in women than in men, which is consistent with previous literature (Apaza et al., 2020; Gavurova et al., 2020; Granados et al., 2020).

Considering the levels of depression, we found that the rate of PIU in moderate depression was 37.9%, 1.8 times higher than the prevalence in the overall sample; and in severe depression, it was 68.8%, 3.27 times higher than the overall sample. Likewise, the mean score on the PHQ-9 was significantly higher among university students with PIU compared to those without PIU, and the rate of severe or moderately severe depression was six times higher in undergraduates with PIU. In other words, the relationship between depression and PIU is clearly established, in line with other studies (Aznar-Díaz et al., 2020; Balhara et al., 2019; González & Estévez, 2017; Kitazawa et al., 2019; Lin et al., 2016; Odaci & Çikrici, 2017; Ramón-Arbués et al., 2020; Starcevic & Khazaal, 2017; Ueno et al., 2020).

Regarding the directionality of the relationship between PIU and depression, although it seems to be bidirectional, there is still not enough evidence (Servidio et al., 2021). Some authors (i.e., Gupta et al., 2018; Odaci & Çikrici, 2017) point to impulsive Internet use as a coping strategy for avoiding negative feelings. Other studies (i.e., Kim et al., 2006; Lam & Peng, 2010; Odaci & Çikrici, 2017) point out that PIU ends up producing a series of alterations that eventually lead to the development of depressive symptoms.

In the present study, although it was not possible to establish causal relationships, the association between PIU and depression in the population of university students was confirmed. The higher the degree of depressive symptomatology, the higher the risk of PIU, with the risk varying according to the level of depression. University students with severe depression had a 23.39% higher risk of developing PIU, those with moderate depression had a 6.46% higher risk, and those with mild depression had a 2.23% higher risk.

Our findings also reinforce the scarce literature linking PIU and suicidal ideation (Cheng et al., 2018; Kim et al., 2006), although in this case, the relationship is moderate. Several studies (Cheng et al., 2018; King et al., 2006; Morrison & Gore, 2010), note that the group of young people with higher uncontrolled Internet use present significantly higher rates of depression, suicidal ideation, and suicide planning and attempts, as well as more severe suicidal ideation. Future studies may offer more concrete explanations for this relationship. In any case, it would make sense to incorporate screening strategies for suicidal ideation in the population with depressive symptoms and PIU.

Suicidal ideation must be considered by itself a problem of utmost priority that requires attention in the university context. In the present study, 6.6% of the students reported suicidal ideation, this being higher in women (4%) than in men (2.5%). This result is in line with the findings reported by Bousoño et al. (2017) in the

adolescent population, with women also presenting greater suicidal ideation and attempts than men. From a preventive perspective, suicide is preventable, and measures can be taken to protect people's mental health (Knipe et al., 2021). In this regard, it would be advisable that universities implement initiatives for its prevention and early detection. These initiatives should follow an approach to suicidal behavior that considers the biological and cultural contexts of people, as well as their own experience of suffering (Al-Halabí & García Haro, 2021). Findings such as the ones from the present study contribute to pointing out PIU as a risk indicator of suicidal ideation, as well as targeting interventions more intensely at the age ranges between 21 and 30 years, given that they present higher percentages than younger people (18-21 years).

From a clinical point of view, the detection of students who present depressive symptoms, suicidal ideation or PIU requires some type of response from the university environment. This may be a referral to Primary Care or Mental Health. In some cases, universities have psychopedagogical care services for the university population. In this regard, Beck's Cognitive Behavioral Therapy, behavioral activation, interpersonal therapy, and mindfulness-based cognitive therapy are the treatments with the greatest empirical support for depressive disorders; or Cognitive Behavioral Therapy for suicidal behavior (Fonseca-Pedrero et al. 2021).

Some of the limitations of this study are the possible errors in coverage, the randomness of the sample, and the response rate, due to the use of an online survey. In any case, actions to compensate for these errors were carried out (see Design and Population sections above). Although our sample was large, it cannot be considered representative of the Spanish population. Therefore, the findings should be generalized with caution. The instrument used to evaluate depression and suicidal ideation is not a clinical instrument and does not allow establishing a diagnosis. The findings should be replicated with scales such as the Columbia-Suicide Severity Rating Scale, Spanish validation (Sp-C-SSRS) (Al-Halabí et al., 2016), or the Frequency of Suicidal Ideation Inventory, Spanish Version (FSII-S) (Sánchez-Álvarez et al., 2020). Participants were not asked about previous mental disorders either. One of the main problems in PIU research is the lack of a universal diagnostic criterion to assess this problem. Longitudinal studies would allow us to find out whether this change lasts over time and evaluate the possible causality between depression and problematic Internet use. Finally, the use of a scale originally developed for adolescents could constitute a limitation of this work. However, the analyses carried out show that it is an equally consistent tool when applied with adult population. This suggests that, despite being assumed as a limitation in this study, it is an opportunity to promote new validation studies with adult population, facilitating the comparison of results between adolescent and adult population.

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References

Afrin, D., Islam, M. U., Rabbiand, F., & Hossain, A. (2017). The school-level factors associated with internet addiction among adolescents: A cross-sectional study in Bangladesh. *Journal of Addiction and Dependence, 3*(2), 170-174. https://doi.org/10.15436/2471-061X.17.1686

Ahorsu, D. K., Imani, V., Lin, C.Y., Timpka, T., Broström, A., Updegraff, J. A., Årestedt, K., Griffiths, M. D., & Pakpour, A. H. (2022). Associations between fear of COVID-19, mental health, and preventive behaviours across pregnant women and husbands: an actor-partner interdependence modelling. *International Journal of Mental Health and Addiction, 20*, 68-82. https://doi.org/10.1007/s11469-020-00340-x

Al-Halabí, S., & Fonseca-Pedrero, E. (2021). Suicidal behavior prevention: The time to act is now. *Clínica y Salud, 32*(2), 89-92. https://doi.org/10.5093/clysa2021a17

Al-Halabí, S., & García Haro, J. M. (2021). Tratamientos psicológicos para la conducta suicida. En E. Fonseca-Pedrero (Coord.), *Manual de tratamientos psicológicos. Adultos* [Manual of psychological treatments. Adults] (pp. 639-675). Pirámide.

Al-Halabí, S., Sáiz, P. A., Burón, P., Garrido, M., Benabarre, A., Jiménez, E., Cervilla, J., Navarrete, M.S., Díaz-Mesa, E.M., García-Álvarez, L., Muñiz, J., Posner, K., Oquendo, M.A., García-Portilla, M.P. & Bobes, J. (2016). Validación de la versión en español de la Columbia-Suicide Severity Rating Scale (Escala Columbia para Evaluar el Riesgo de Suicidio) [Validation of the Spanish version of the Columbia-Suicide Severity Rating Scale]. *Revista de Psiquiatría y Salud Mental, 9*(3), 134-142. https://doi.org/10.1016/j.rpsm.2016.02.002

Apaza, C. M., Sanz, R. S. S., & Arévalo, J. E. S. (2020). Factores psicosociales durante el confinamiento por el Covid-19–Perú [Psychosocial factors during confinement by Covid-19-Peru]. *Revista Venezolana De Gerencia, 25*(90), 402-410. https://www.redalyc.org/articulo.oa?id=29063559022

Aznar-Díaz, I., Kopecký, K., Romero, J. M., Cáceres, M. P., & Trujillo-Torres, J. M. (2020). Patologías asociadas al uso problemático de Internet. Una revisión sistemática y metaanálisis en WOS y Scopus [Pathologies associated with the problematic use of the internet. A systematic review and meta-analysis in WOS and Scopus]. *Investigación Bibliotecológica, 34*(82), 229-253. https://doi.org/10.22201/iibi.24488321xe.2020.82.58118

Balhara, Y. P. S., Doric, A., Stevanovic, D., Knez, R., Singh, S., Chowdhury, M. R. R., Kafali, H. Y., Sharma, P., Vally, Z., Vu, T.V., Arya, S., Mahendru, A., Ransing, R., Erzin, G., & Hong, H.C. (2019). Correlates of problematic internet use among college and university students in eight countries: An international cross-sectional study. *Asian Journal of Psychiatry, 45*, 113-120. https://doi.org/10.1016/j.ajp.2019.09.004

Banerjee, D. (2020). The COVID-19 outbreak: Crucial role the psychiatrists can play. *Asian Journal of Psychiatry, 50*, Article 102014. https://doi.org/10.1016/j.ajp.2020.102014

Barrera-Herrera, A., Neira-Cofré, M., Raipán-Gómez, P., Riquelme-Lobos, P., & Escobar-Alaniz, B. (2019). Apoyo social percibido y factores sociodemográficos en relación con los síntomas de ansiedad, depresión y estrés en universitarios chilenos [Perceived social support and sociodemographic factors in relation to symptoms of anxiety, depression and stress in Chilean university students]. *Revista de Psicopatología y Psicología Clínica, 24*(2), 105-115. https://doi.org/10.5944/rppc.23676

Blasi, D., Giardina, A., Giordano, C., Coco, G., Tosto, C., Billieux, J., & Schimmenti, A. (2019). Problematic video game use as an emotional coping strategy: Evidence from a sample of MMORPG gamers. *Journal of Behavioral Addictions, 8*(1), 25-34. https://doi.org/10.1556/2006.8.2019.02

Bousoño,M., Al-Halabí, S., Burón, P., Garrido, M., Díaz-Mesa, E.V., Galván, G., García-Álvarez, L., Carli, V., Hoven, C., Sarchiapone, M., Wasserman, D., Bousoño, M., García-Portilla, M.P., Iglesias, C., Sáiz, P.A. & Bobes, J. (2017). Uso y abuso de sustancias psicotrópicas e internet, psicopatología e ideación suicida en adolescentes [Substance use or abuse, internet use, psychopathology and suicidal ideation in adolescents]. *Adicciones, 29*(2), 97-104. https://www.redalyc.org/articulo.oa?id=289150531004

Cheng, Y., Tseng, P., Lin, P., Chen, T., Stubbs, B., Carvalho, A. F., Wu, C., Chen, Y., & Wu, M. (2018). Internet addiction and its relationship with suicidal behaviors: a meta-analysis of multinational observational studies. *The Journal of Clinical Psychiatry, 79*(4), Article 9291. https://doi.org/10.4088/JCP.17r11761

Deleuze, J., Maurage, P., Schimmenti, A., Nuyens, F., Melzer, A., & Billieux, J. (2019). Escaping reality through videogames is linked to an implicit preference for virtual over real-life stimuli. *Journal of Affective Disorders, 245*, 1024-1031. https://doi.org/10.1016/j.jad.2018.11.078

Diez-Quevedo, C., Rangil, T., Sanchez-Planell, L., Kroenke, K., & Spitzer, R. L. (2001). Validation and utility of the patient health questionnaire in diagnosing mental disorders in 1003 general hospital Spanish inpatients. *Psychosomatic Medicine, 63*(4), 679-686. https://doi.org/10.1097/00006842-200107000-00021

Fonseca-Pedrero, E., Pérez-Álvarez, M., Al-Halabí, S., Inchausti, F., Muñiz, J., López-Navarro, E., Pérez, A., Lucas, B., Debbané, M., Bobes-Bascarán, M., Gimeno-Peón, A., Prado-Abril, J., Fernández-Álvarez, J., Rodríguez-Testal, J., González, D., Díez-Gómez, A., García, J.M., García-Cerdán, L., Osma, J., […] Quilez, A. (2021). Tratamientos psicológicos empíricamente apoyados para adultos: una revisión selectiva [Evidence-based psychological treatments for adults: a selective review]. *Psicothema, 33*(2), 188-197. https://doi.org/ 10.7334/psicothema2020.426

Frangos, C. C., Fragkos, K. C., & Kiohos, A. (2010). Internet addiction among Greek university students: Demographic associations with the phenomenon, using the Greek version of young's internet addiction test. *International Journal of Economic Sciences and Applied Research, 3*(1), 49-74. https://econpapers.repec.org/article/teijournl/v_3a3_3ay_3a2010_3ai_3a1_3ap_3a49-74.htm

García-Peñalvo, F. J., Corell, A., Abella-García, V., & Grande, M. (2020). Online assessment in higher education in the time of COVID-19. *Education in the Knowledge Society, 21*, 1-26. https://doi.org/10.14201/eks.23013

Gavurova, B., Ivankova, V., & Rigelsky, M. (2020). Relationships between perceived stress, depression and alcohol use disorders in university students during the COVID-19 pandemic: a socio-economic dimension. *International Journal of Environmental Research and Public Health, 17*(23), Article 8853. https://doi.org/10.3390/ijerph17238853

González, N., & Estévez, A. (2017). El apoyo social percibido moderador entre el uso problemático de internet y la sintomatología depresiva en jóvenes adultos [Moderating perceived social support between problematic internet use and depressive symptomatology in young adults]. *Salud y Drogas, 17*(1), 53-62. https://www.redalyc.org/pdf/839/83949782006.pdf

Granados, J. A., Gómez, O., Islas, M. I., Maldonado, G., Martínez, H. F., & Pineda, A. M. (2020). Depression, anxiety and suicidal behavior in medical training at a University in Mexico. *Investigación en Educación Médica, 9*(35), 65-74. https://doi.org/10.22201/facmed.20075057e.2020.35.20224

Gupta, A., Khan, A. M., Rajoura, O. P., & Srivastava, S. (2018). Internet addiction and its mental health correlates among undergraduate college students of a university in north India. *Journal of Family Medicine and Primary Care, 7*(4), 721-727. https://doi.org/10.4103/jfmpc.jfmpc_266_17

Hassan, T., Alam, M., Wahab, A., & Hawlader, M. (2020). Prevalence and associated factors of internet addiction among young adults in Bangladesh. *Journal of the Egyptian Public Health Association, 95*, Article 3. https://doi.org/10.1186/s42506-019-0032-7

Huang, Y., & Zhao, N. (2020). Chinese mental health burden during the COVID-19 pandemic. *Asian Journal of Psychiatry, 51*, Article 102052. https://doi.org/10.1016/j.ajp.2020.102052

Instituto Nacional de Estadística (2019). *Encuesta sobre Equipamiento y Uso de Tecnologías de Información y Comunicación en los Hogares* [Survey on Equipment and Use of Information and Communication Technologies in Households]. https://www.ine.es/ss/Satellite?L=es_ES&c=INEPublicacion_P&cid=1254735117586&idp=1254735117586&p=1254735110606&pagename=ProductosYServicios%2FPYSLayout&tittema=Ciencia%20y%20tecnolog%C3%ADa

Islam, M.A., & Hossin, M. Z. (2016). Prevalence and risk factors of problematic internet use and the associated psychological distress among graduate students of Bangladesh. *Asian Journal of Gambling Issues and Public Health, 6*(1), 1-14. https://doi.org/10.1186/s40405-016-0020-1

Islam, M. S., Ferdous, M. Z., & Potenza, M. N. (2020). Panic and generalized anxiety during the COVID-19 pandemic among Bangladeshi people: An online pilot survey early in the outbreak. *Journal of Affective Disorders, 276*, 30-37. https://doi.org/10.1016/j.jad.2020.06.049

Islam, M. S., Sujan, M.S.H, Tasnim, R., Sikder, M.T., Potenza, M.N. & Van Os, J. (2020). Psychological responses during the COVID-19 outbreak among university students in Bangladesh. *PloS One, 15*(12), Article e0245083. https://doi.org/10.1371/journal.pone.0245083

Johnson, J. G., Harris, E. S., Spitzer, R. L., & Williams, J. B. (2002). The patient health questionnaire for adolescents: validation of an instrument for the assessment of mental disorders among adolescent primary care patients. *Journal of Adolescent Health, 30*(3), 196-204. https://doi.org/10.1016/S1054-139X(01)00333-0

Kim, K., Ryu, E., Chon, M., Yeun, E., Choi, S., Seo, J., & Nam, B. (2006). Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. *International Journal of Nursing Studies, 43*(2), 185-192. https://doi.org/10.1016/j.ijnurstu.2005.02.005

King, C.A., Kramer, A., Preuss, L., Kerr, D.C.R., Weisse, L., & Venkataraman, S. (2006). Youth-Nominated Support Team for suicidal adolescents (Version 1): A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 74*(1), 199-206. https://doi.org/10.1037/0022-006X.74.1.199

Knipe, D., Hawton, K., Siynor, M., & Niederkrotenthaler, T. (2021). Researchers must contribute to responsible reporting of suicide. *BMJ, 372*, Article n351. https://doi.org/10.1136/bmj.n351

Kitazawa, M., Yoshimura, M., Hitokoto, H., Sato-Fujimoto, Y., Murata, M., Negishi, K., Mimura, M., Tsubota, K., & Kishimoto, T. (2019).

Survey of the effects of internet usage on the happiness of Japanese university students. *Health and Quality of Life Outcomes, 17*(1), 1-8. https://doi.org/10.1186/s12955-019-1227-5

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Laconi, S., Rodgers, R. F., & Chabrol, H. (2014). The measurement of Internet addiction: A critical review of existing scales and their psychometric properties. *Computers in Human Behavior, 41*, 190-202. https://doi.org/10.1016/j.chb.2014.09.026

Lam, L. T., & Peng, Z. (2010). Effect of pathological use of the internet on adolescent mental health: a prospective study. *Archives of Pediatrics & Adolescent Medicine, 164*(10), 901-906. https://doi.org/10.1001/archpediatrics.2010.159

Ley de protección de datos personales y garantía de derechos digitales, del 5 de diciembre [Spanish Organic Law 3/2018 on personal data protection and digital rights guarantee]. *Boletín Oficial del estado, 294*, del 6 de diciembre de 2018. https://www.boe.es/eli/es/lo/2018/12/05/3

Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., Hoffman, B. L., Giles, L. M., & Primack, B. A. (2016). Association between social media use and depression among US young adults. *Depression and Anxiety, 33*(4), 323-331. https://doi.org/10.1002/da.22466

Ma, Z., Zhao, J., Li, Y., Chen, D., Wang, T., Zhang, Z., Chen, Z., Yu, Q., Jiang, J., & Fan, F. (2020). Mental health problems and correlates among 746 217 college students during the coronavirus disease 2019 outbreak in China. *Epidemiology and Psychiatric Sciences, 29*, Article e181. https://doi.org/10.1017/S2045796020000931

Machimbarrena, J. M., González-Cabrera, J., Ortega-Barón, J., Beranuy-Fargues, M., Álvarez-Bardón, A., & Tejero, B. (2019). Profiles of problematic internet use and its impact on adolescents' health-related quality of life. *International Journal of Environmental Research and Public Health, 16*(20), Article 3877. https://doi.org/10.3390/ijerph16203877

Mamun, M. A., & Griffiths, M. D. (2019). The assessment of internet addiction in Bangladesh: Why are prevalence rates so different? *Asian Journal of Psychiatry, 40*, 46-47. https://doi.org/10.1016/j.ajp.2019.01.017

Morrison, C. M., & Gore, H. (2010). The relationship between excessive Internet use and depression: a questionnaire-based study of 1,319 young people and adults. *Psychopathology, 43*(2), 121-126. https://doi.org/10.1159/000277001

Odaci, H., & Çikrici, Ö. (2017). An exploration of the associations among internet use, depression, anxiety and stress among youths. *Mediterranean Journal of Clinical Psychology, 5*(3), 1-13. https://doi.org/10.6092/2282-1619/2017.5.1635

Oka, T., Hamamura, T., Miyake, Y., Kobayashi, N., Honjo, M., Kawato, M., Kubo, T., & Chiba, T. (2021). Prevalence and risk factors of internet gaming disorder and problematic internet use before and during the COVID-19 pandemic: A large online survey of Japanese adults. *Journal of Psychiatric Research, 142*, 218-225. https://doi.org/10.1016/j.jpsychires.2021.07.054

Pettorruso, M., Valle, S., Cavic, E., Martinotti, G., Di Giannantonio, M., & Grant, J. E. (2020). Problematic Internet use (PIU), personality profiles and emotion dysregulation in a cohort of young adults: trajectories from risky behaviors to addiction. *Psychiatry Research, 289*, Article 113036. https://doi.org/10.1016/j.psychres.2020.113036

Polo del Río, M., Lázaro, S. M., del Barco, B. L., & Castaño, E. F. (2017). Abuso del móvil en estudiantes universitarios y perfiles de victimización y agresión [Mobile phone abuse in university students and profiles of victimization and aggression]. *Adicciones, 29*(4), 245-255. https://www.redalyc.org/articulo.oa?id=289153037004

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry, 33*, Article e100213. https://doi.org/10.1136/gpsych-2020-100213

Ramón-Arbués, E., Gea-Caballero, V., Granada-López, J. M., Juárez-Vela, R., Pellicer-García, B., & Antón-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Environmental Research and Public Health, 17*(19), Article 7001. https://doi.org/10.3390/ijerph17197001

Restrepo, J. E., Sánchez, O. A., Vallejo, G. C., Quirama, T. C., Sánchez, Y. O., & Cardona, P. D. (2018). Depresión y su relación con el consumo de sustancias psicoactivas, el estrés académico y la ideación suicida en estudiantes universitarios colombianos [Depression and its relationship with the consumption of psychoactive substances, academic stress and suicidal ideation in colombian university students]. *Health and Addictions, 18*(2), 227-239. https://dialnet.unirioja.es/servlet/articulo?codigo=6546342

Rial, A. R., Gómez, P., Isorna, M., Gallego, M. A., & Mallou, J. V. (2015). EUPI-a: Escala de Uso Problemático de Internet en adolescentes. Desarrollo y validación psicométrica [PIUS-a: Problematic Internet Use Scale in adolescents. Development and psychometric validation]. *Adicciones, 27*(1), 47-63. https://doi.org/10.20882/adicciones.193

Rodrigues, B., Marques, M., Pereira, A. T., & Macedo, A. (2020). Internet use patterns and the relation between generalized problematic internet use and psychological distress in Portuguese university students. *Revista de Psicopatologia y Psicologia Clinica, 25*(1), 31-39. https://doi.org/10.5944/rppc.25324

Sánchez-Álvarez, N., Extremera, N., Rey, L., Chang, E.C. & Chang, O. D. (2020). Frequency of Suicidal Ideation Inventory: Psychometric Properties of the Spanish Version. *Psicothema, 32*(2), 253–260. https://doi.org/10.7334/psicothema2019.344

Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Globalization and Health, 16*, 1-11. https://doi.org/10.1186/s12992-020-00589-w

Schimmenti, A., Billieux, J., & Starcevic, V. (2020). The four horsemen of fear: An integrated model of understanding fear experiences during the COVID-19 pandemic. *Clinical Neuropsychiatry, 17*(2), 41-45. https://doi.org/10.36131/CN20200202

Servidio, R., Bartolo, M. G., Palermiti, A. L., & Costabile, A. (2021). Fear of COVID-19, depression, anxiety, and their association with Internet addiction disorder in a sample of Italian students. *Journal of Affective Disorders Reports, 4*, Article 100097. https://doi.org/10.1016/j.jadr.2021.100097

Shadzi, M. R., Salehi, A., & Vardanjani, H. M. (2020). Problematic internet use, mental health, and sleep quality among medical students: A path-analytic model. *Indian Journal of Psychological Medicine, 42*(2), 128-135. https://doi.org/10.4103/IJPSYM.IJPSYM_238_19

Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., & Benedek, D. M. (2020). Public responses to the novel 2019 coronavirus (2019-

nCoV) in Japan: Mental health consequences and target populations. *Psychiatry and Clinical Neurosciences, 74*(4), 277-283. https://doi.org/10.1111/pcn.12988

Spitzer, R. L., Kroenke, K., Williams, J. B., & Patient Health Questionnaire Primary Care Study Group, & Patient Health Questionnaire Primary Care Study Group (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *JAMA, 282*(18), 1737-1744. https://doi.org/10.1001/jama.282.18.1737

Starcevic, V., & Khazaal, Y. (2017). Relationships between behavioural addictions and psychiatric disorders: What is known and what is yet to be learned?. *Frontiers in Psychiatry, 8*, Article 53. https://doi.org/10.3389/fpsyt.2017.00053

Sun, Y., Li, Y., Bao, Y., Meng, S., Sun, Y., Schumann, G., Kosten, T., Strang, J., Lu, L., & Shi, J. (2020). Brief report: increased addictive internet and substance use behavior during the COVID-19 pandemic in China. *The American Journal on Addictions, 29*(4), 268-270. https://doi.org/10.1111/ajad.13066

The jamovi project (2022). Jamovi (version 2.3.9) [Computer Software]. Retrieved from https://www.jamovi.org

Tateno, M., Teo, A. R., Shiraishi, M., Tayama, M., Kawanishi, C., & Kato, T. A. (2018). Prevalence rate of Internet addiction among Japanese college students: Two cross-sectional studies and reconsideration of cut-off points of Young's Internet Addiction Test in Japan. *Psychiatry and Clinical Neurosciences, 72*(9), 723-730. https://doi.org/10.1111/pcn.12686

Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry, 66*(4), 317-320. https://doi.org/10.1177/0020764020915212

Uddin, M. S., Al Mamun, A., Iqbal, M. A., Nasrullah, M., Asaduzzaman, M., Sarwar, M. S., & Amran, M. S. (2016). Internet addiction disorder and its pathogenicity to psychological distress and depression among university students: A cross-sectional pilot study in Bangladesh. *Psychology, 7*(8), 1126-1137. https://doi.org/10.4236/psych.2016.78113

Ueno, T., Ito, K., Murai, T., & Fujiwara, H. (2020). Mental Health Problems and Their Association With Internet Use in Medical Residents. *Frontiers in Public Health, 8*, Article 587390. https://doi.org/10.3389/fpubh.2020.587390

Vigna-Taglianti, F., Brambilla, R., Priotto, B., Angelino, R., Cuomo, G., & Diecidue, R. (2017). Problematic internet use among high school students: Prevalence, associated factors and gender differences. *Psychiatry Research, 257*, 163-171. https://doi.org/10.1016/j.psychres.2017.07.039

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5), Article 1729. https://doi.org/10.3390/ijerph17051729

Wathelet, M., Duhem, S., Vaiva, G., Baubet, T., Habran, E., Veerapa, E., Debien, C., Molenda, S., Horn, M., & Grandgenèvre, P. (2020). Factors associated with mental health disorders among university students in France confined during the COVID-19 pandemic. *JAMA Network Open, 3*(10), Article e2025591. https://doi.org/10.1001/jamanetworkopen.2020.25591

World Health Organization. (2020). *Mental health and psychosocial considerations during the COVID-19 outbreak-18 March* (No. WHO/2019-nCoV/MentalHealth/2020.1). https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf

Young, K. S. (2004). Internet addiction: A new clinical phenomenon and its consequences. *American Behavioral Scientist, 48*(4), 402-415. https://doi.org/10.1177/0002764204270278

Zhang, Y., Peters, A., & Chen, G. (2018). Perceived stress mediates the associations between sleep quality and symptoms of anxiety and depression among college nursing students. *International Journal of Nursing Education Scholarship, 15*(1), Article 20170020. https://doi.org/10.1515/ijnes-2017-0020