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Article

Suicidal Behavior and Problematic Internet Use in College Students

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ABSTRACT

Background: Suicidal behavior, especially in young populations such as university students, is currently one of the most concerning health problems worldwide, suicide being the second leading cause of death among students. Although literature is still scarce, one of the risk factors that correlates the most with suicidal behavior in young people appears to be problematic internet use (PIU). The aim of this study was to investigate the relationship between PIU and suicidal behavior in a Spanish university population. **Method:** An ex post facto prospective design was used with a sample of 1,386 Spanish university students (68.7% women and 31.3% men). PIU was assessed by means of the Internet Addiction Test (IAT) and psychological problems by means of the Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). **Results:** The results confirm the relationship between PIU and suicidal behavior, principally alongside those of social isolation and depression, this risk being 3.78 times higher among women with PIU and 5.58 times higher in men. **Conclusions:** PIU appears as a risk factor for suicidal behavior that must be taken into account together with social isolation, subjective distress and depression.

Conducta Suicida y Uso Problemático de Internet en Estudiantes Universitarios

Palabras clave:
Conducta suicida
Ideación suicida
Uso problemático de Internet
Problemas psicológicos
Estudiantes universitarios

RESUMEN

Antecedentes: La conducta suicida, sobre todo en población joven como la universitaria, es actualmente uno de los problemas de salud que más preocupa a nivel mundial, siendo el suicidio la segunda causa de muerte en esta población. Aunque la literatura aún es escasa, parece que el uso problemático de Internet (UPI) se muestra como uno de los factores de riesgo que más correlaciona con la conducta suicida en jóvenes. El objetivo de esta investigación es estudiar la relación entre el UPI y la conducta suicida en población universitaria española. **Método:** Se utilizó un diseño prospectivo ex post facto con una muestra universitaria española de 1,386 (68.7% mujeres y 31.3% hombres), evaluando el UPI mediante el *Internet Addiction Test* (IAT) y los problemas psicológicos mediante el *Clinical Outcomes in Routine Evaluation-Outcome Measure* (CORE-OM). **Resultados:** Los resultados obtenidos confirman la relación existente entre el UPI y la conducta suicida, en relación también con el aislamiento social y la depresión principalmente, siendo este riesgo 3.78 veces mayor entre las mujeres con UPI y de 5.58 en hombres. **Conclusiones:** El UPI se presenta como un factor de riesgo para el suicido a tener en cuenta junto con el aislamiento social, la angustia subjetiva y la depresión.

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Suicidal behavior is a huge social and public health problem (Al-Halabi et al., 2016; Lim et al., 2019) and one of the world´s leading causes of death among adolescents and young people (Al-Halabí & Fonseca-Pedrero, 2021; WHO, 2014). Both in Europe and the United States, it represents the second leading cause of death among adolescents and young people (Al-Halabí & Fonseca-Pedrero, 2021). This is also the case in Spain, where 3,941 people died by suicide in 2020 (de la Torre-Luque et al., 2022). This marks an increase in the number of suicide deaths in recent years among young people between 15-19 and 20-24 years of age, with women attempting suicide three times more frequently than men, but with men actually committing suicide three times more frequently than women (Chiles et al., 2019).

This increase has also been observed in specific sectors of the young population such as university students (Mortier et al., 2017), where suicide constitutes the second leading cause of death (Drum et al., 2009).

Although research is still scarce, such a significant increase has led some authors to consider it a growing problem and one that may reach epidemic proportions (De Luca et al., 2016).

As has been highlighted in the literature, however, the problem to be studied is not only consummated suicide, but the widely varying manifestations of suicidal behaviors that may occur, ranging from ideation, planning, and suicidal communication to attempted and consummated suicide (Al-Halabí & Fonseca-Pedrero, 2021). Suicidal behavior therefore constitutes a complex, multidimensional, multicausal phenomenon (Al-Halabí & Fonseca-Pedrero, 2021; Fonseca-Pedrero et al., 2020; WHO, 2014) where, in order to explain why a person decides to commit suicide, it is necessary to take into account a combination of continuously and dynamically interacting biological, psychological and sociocultural factors. To understand suicidal behavior, it is important to know how a person deals with his or her emotional suffering in the face of life's difficulties and ups and downs, because this is not a psychopathological problem or a mental disorder, but a fundamentally psychological phenomenon characterized by the presence of suffering and intolerable psychological pain in which a decision is made to end one's life (Al-Halabí & García-Haro, 2021).

Furthermore, in the process of studying and understanding suicidal behavior, the literature has already identified various risk, protective, and precipitating factors (Fonseca-Pedrero & Pérez-Albéniz, 2020). Factors associated with suicide risk can be divided into four groups: personality and individual differences, cognitive factor and social factors, and negative life events. Some of these factors may be associated with the occurrence of suicidal ideation while others seem to increase the likelihood of suicidal thoughts being acted upon (O'Connor & Nock, 2014). It should be noted, however, that in one subsequent meta-analysis (Franklin et al., 2017) it was found that the prognostic and predictive ability of risk factors for suicidal behavior and ideation appeared to be limited. The mentioned meta-analysis questioned the scientific validity of many of the taxonomies of the factors studied (Franklin et al., 2017) and it seems that heterogeneity in the explanation of suicidal behavior is the rule rather than the exception (Fonseca-Pedrero et al., 2020).

In the specific field of college students, we found that most research has focused on studying the risk factors associated with suicidality (Li et al., 2020; Uchida & Uchida, 2017), identifying, for example, how substance use has become an important factor associated with the increase in suicidal tendencies (De Luca et al., 2016). Few studies, however, have examined the protective factors associated with decreases in suicidality in college students (Aizpurua et al., 2021). In a systematic review of suicide risk in college students carried out by Li et al. (2020) it was shown that depression, traumatic events, sleep disorders, hopelessness, loneliness and feeling frustrated presented a significant relationship with very high suicide risk and that hope and reasons for living constituted protective factors.

As noted above, there is evidence that substance addictions are a risk factor, and in view of this it should be taken into account that the problem of Internet addiction and other non-substance addictions has been gaining in relevance in the literature in recent years (Pino et al., 2022). However, the very existence of Internet addiction is a subject under debate and, although neither the *Diagnostic and Statistical Manual of Mental Disroders* (5th ed.; DSM-5; American Psychiatric Association, 2013) nor the *International Classification of Diseases* (11th Revision; ICD-11; World Health Organization, 2019) currently recognize it as a disorder, they do recognize it as a phenomenon to be studied in future research. In line with the above, scientific literature has produced different terms to refer to the phenomenon: "Internet addiction", "pathological Internet use", "problematic Internet use" (PIU) and "excessive Internet use" (Echeburúa & Corral, 2010; Spada, 2014; Zhou et al., 2017). The term PIU, in particular, has become increasingly widespread (Pino et al., 2022). Banz et al. (2016) defined PIU as a condition involving excessive or poorly controlled impulses and behaviors with Internet use leading to distress and/or interference in important areas of life functioning.

PIU mostly affects the young population. According to López-Fernández & Kuss (2019), prevalences by country range from 1% to 13% in young people, values being higher in the south of Europe (e.g., Spain) (Tsitsika et al., 2014) and higher among males than among females (Laconi et al., 2018). As Kuss et al. (2014) assert, prevalence rates probably differ as a consequence of using different sampling methods, and different assessment instruments or cut-off points. The same authors consider that, despite these differences, it should be kept in mind that all assessment instruments are based on criteria of addiction diagnosis, and that rather than being considered contradictory, they should be considered complementary. Further research on cultural differences is therefore needed to better understand how problematic Internet use works.

The possible influence of Internet use on suicidal behavior in young people is of great concern, since, at this stage, young people also experience stress due to their own evolutionary development and the circumstances in which they live (Lung et al., 2020). Daine et al. (2013) conducted a systematic review studying the influence of Internet use on self-harm and found both positive and negative results. Although the Internet can provide young people who may be socially isolated with support (Duggan et al., 2012; Westerlund, 2013) and social networks, it can also provide access to suicidal content (Carew et al., 2014; Dunlop et al., 2011; Grzanka et al., 2014), instances of normalized self-harm in online forums (Zdanow et al., 2012) and the lowering of thresholds for self-harm.

The effect of Internet use on suicidality could therefore be described as confusing. On the one hand, it is seen to increase the risk of suicidal behavior by facilitating interaction between people

with suicidal intentions (Bousoño et al., 2017), while on the other hand it could be a form of protection against suicidal ideation if used as a source of emotional support or as a tool to improve coping strategies (Daine et al., 2013).

Another study, conducted in South Korea, found that there is a significant relationship between Internet addiction and suicidal behavior, with people with PIU being 1.9 times more likely to experience suicidal ideation, 3 times more likely to have planned suicide, and 1.7 times more likely to attempt suicide during their lifetime than non-PIU people (Kim et al., 2006). The prevalence of PIU in the younger age group (18- 24 years) was found to be 2.5 times higher than in the older age group. This and other studies, such as the meta-analysis by Cheng et al., (2018), corroborate the link between Internet addiction and suicidality but also state that more prospective studies are needed in the future to confirm these findings.

Psychological factors, then, are interrelated with suicidal behaviors, but they are not the only causes. Suicidal behaviors have also been shown to be associated with risk behaviors like peer victimization, sexual risk behaviors, delinquency, substance abuse, non-suicidal self-injury, physical inactivity, and poor nutrition (Wasserman et al., 2010).

In this regard, it has been suggested that PIU not only influences suicidal behavior but may also affect other aspects such as psychological well-being (Lai et al., 2015), academic performance and procrastination (Anam-ul-Malik & Rafiq, 2016), and interaction with family and friends (Young, 1998 in Lung et al., 2020).

Several studies suggest that excessive Internet use is associated with decreased communication with family and social circles, which can lead to increased levels of loneliness, depression (Carli et al., 2013; Lai et al., 2015; Lozano-Blasco & Cortés-Pascual, 2020), and sleep disorders (Alimoradi et al., 2019).

On the other hand, some studies suggest that the virtual relationships that young people establish may be more intimate than in-person relationships, especially for people who are shy, have anxiety problems, and lack social skills (Lai et al., 2015; Moral-Jiménez & Castro, 2017).

However, it is not yet clear to what extent young people are influenced by exposure to suicidal ideation on the Internet, to which many of them may have access and to which many of them are also addicted (Liu et al., 2017). Very little research has linked Internet addiction with possible mechanisms for identifying and managing suicidal ideation, self-harm, or suicide risk (Liu et al., 2017).

In short, research into suicidal behaviors and PIU is scarce both internationally and in Spain. In this country, in a study carried out with adolescents aged between 14 and 16 years of age as part of the European project Saving and Empowering Young Lives in Europe (SEYLE; Bousoño et al., 2017), Bousoño et al. (2017) observed differences in suicidal ideation and suicidal behaviors with respect to other European countries, probably due to the socio-cultural differences that exist between countries. The data obtained confirmed the link between the consumption of potentially addictive substances, inappropriate use of the Internet, psychopathology and suicidal ideation (Bousoño et al., 2017).

There is therefore a need for a good understanding of all the risk factors that contribute to suicidal behavior in young people. Unraveling knowledge about the complex interactions between such risk factors is essential for the development of effective strategic prevention plans for suicidal ideation and suicide (Vargas-Medrano et al., 2020). The aim of the present work, then, was to study the relationship between PIU and suicidal behaviors in a sample of Spanish university students using the Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM; Evans et al., 2002) "risk to self" dimension (a scale that evaluates suicidal ideation and self-harm), and to assess whether differences exist by sex and area of study.

Method

Participants

A total of 1,386 Spanish university students participated in the study (78.3% undergraduates and 21.7% master's degree students). Of the sample 68.7% were women and 31.3% were men. The average age was 21.8 years (SD = 4.6). The sample was homogeneous by degree subject and sex (sex: $\chi^2 = 3.60$; p = .058). Cluster sampling was carried out, choosing classes from six randomly selected universities (5 public and 1 private) in which to administer the survey. The universities were representative of the different areas of study in higher education. Twenty-six percent of the participants were students of Humanities, 33.9% of Social, Economic and Legal Sciences, 16.1% of Sciences and Health Sciences and 29.4% of Technology. That is to say, 45.5% were students of sciences and technologies and 54.5% were students of social sciences and humanities.

Instruments

An *ad hoc* questionnaire was developed, containing several instruments:

Sociodemographic and Internet use questionnaire: sex, age, studies, whether the person had a disability, number of hours and percentage of time online dedicated to leisure, work, studies, etc.

Internet Addiction Test (IAT; Young, 1998) adapted for Spanish speakers by Carbonell et al. (2012) and validated in Spain by Fernández-Villa et al. (2015). This test analyses the extent to which Internet use affects a person's daily life, social life, productivity, sleep, and feelings. It consists of 20 elements, evaluated on a Likert scale of 0 to 5 (0 = Never; 1 = Almost never; 2 = Occasionally; 3 = Frequently; 4 = Often; 5 = Always). The IAT author (Young, 2011) proposed six dimensions within this phenomenon: salience, excessive use, neglect of work, anticipation, lack of control, neglect of social life. The literature reports internal structures ranging from one to six dimensions. Young (1998, 2011) proposes the following classification of scores: normal (0-30), light addiction (30-50), moderate (50-80), and severe (80-100). The Cronbach's alpha internal consistency coefficient is close to 0.90. In the present study, the sample alpha coefficient was 0.925.

Like: Two items were added after the Internet Addiction Test (IAT; Young, 1998), one asking about negative feelings caused by not acquiring a desired number of "likes" on social networks, and another asking about the frequency with which participants checked social networks to see if "friend" or "follower" numbers had increased. These items had a correlation of r= .05 (p<.001) with the Social Networks Addiction Questionnaire, validated in Spain by Casas et al (2013). High scores in these items were linked

to the Internet being used primarily as a means of communicating and networking.

Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM; Evans et al., 2002) adapted for Spanish populations by Trujillo et al. (2016). This is a self-report questionnaire consisting of 34 items that assess the subject's condition based on four dimensions or domains: 1) Subjective well-being/discomfort (4 items); 2) Problems/symptoms (12 items, measuring anxiety, depression, trauma and physical symptoms); 3) Life functioning (12 items, assessing intimate relationships, social relationships and levels of daily functioning); and 4) Risk (6 items serving as clinical indicators of the patient being 'at risk' to themselves or others). In this study, we used the four *"risk to self"* items, asking participants whether, during last 7 days: (i) they had thought of hurting themselves; (ii) they had made plans to end their life; (iii) they had thought it would be better if they were dead, and (iv) they had hurt themselves physically or taken dangerous risks with their health. These items cover suicidal ideation and self-harm (although the latter does not specify whether the harm was inflicted with or without the intention to end their life).

Mean scores below 1 indicate healthy levels (except for Risk, they were around 0.43 for males and 0.31 for females). The psychometric properties of this test have displayed acceptable levels of internal consistency (Cronbach´s alpha values between .75 and .90) and sensitivity in the measurements obtained (Evans et al., 2002). The test has been used in numerous clinical settings (Connell et al., 2007; Palmieri et al., 2009) and with university populations (Botella, 2006; Connell et al., 2007), showing convergent validity with the Beck Depression Inventory II (BDI-II; Beck et al., 1996) and the Symptom Checklist-90-Revised (SCL-90-R; Derogatis & Savitz, 1999). In the present study, the sample´s alpha coefficient was .87.

Procedure

The study procedures were in accordance with the Declaration of Helsinki, and the study was approved by the Institutional Review Board of the Andalusian Regional Government (Ethics Committee). After approval by the Ethics Committee, six randomly selected universities (5 public and 1 private) were contacted and agreed to participate. Teachers representative of the different areas of study in the universities were asked to set aside a few minutes of class time for the students to fill in the questionnaire. The teachers were not present while this was being done. On the first page of the questionnaire, informed consent was requested, and information was given about confidentiality. Participants were informed that the data they provided in the questionnaire would be used exclusively for research purposes. No identity information was collected, and participants were offered no kind of incentive for completing the survey.

Data analysis

The study was carried out following an ex post facto retrospective transversal design.

Contingency tables were made using, as categorization, the cut-off points for the different factors of the CORE-OM (healthy/clinical) and the categories of Internet use proposed by the IAT author (Young, 2011): normal use (0-30), mild problems (31-50), moderate (50-80) and severe (>80). The CORE-OM classifies scores as healthy/clinical according to whether they are below (healthy) or above (clinical) the cut-off point (0.43 in men and 0.31 in women). Chi square is used as a statistical test.

A parametric test (analysis of variance [ANOVA]) was then performed to compare the subgroups of participants created by their scores in PIU, "risk to self", and interaction between sex and PIU. The effect size was calculated using the η^2 coefficient and considering the classification proposed by Cohen (1988), according to which $\eta^2 < .1$ would be low, $\eta^2 > .1 < .25$ would be moderate, and $\eta^2 > .4 < .4$ would be high.

In order to better demonstrate the effects of the independent variables on the "risk to self" variable, a binary logistic regression analysis (forward) was then performed comparing those participants with normal "risk to self" scores (risk to themselves = 0, which accounted for 78.7% of the sample) with those with a high score (risk to self > 1, 3.9% of the sample). Intermediate scores, which represented slight risk to self (17.4%), were omitted from the analysis. For this purpose, a dichotomous variable was created. The logistic regression analysis was then performed, including, as independent variables, the 6 dimensions of the IAT (salience, excessive use, neglect of work, anticipation, lack of control, neglect of social life), the Like dimension (questions about the need to have followers and approval on social networks), and the variables measured by the CORE-OM: subjective well-being, anxiety, depression, physical symptoms, traumatic symptoms, life functioning, functioning in intimate friendship and support relationships. All analyses were performed using the Statistical Package for the Social Sciences (SPSS-25).

Results

The aim of this work was to study the relationship between PIU and suicidal behaviors, as evaluated by the CORE-OM "risk to self" dimension (a scale that evaluates suicidal ideation and self-harm), and to assess whether differences exist by sex and area of study.

Table 1 shows the percentages of participants classified as healthy or clinical in CORE-OM. The bottom part of the table shows the "risk to self" dimension (evaluating suicidal ideation and self-harm, but not specifying whether the self-harm is suicidal or not) with the IAT scores and classifications. The percentage of people whose score was classified as "risk to self" (or clinical, according to the terminology used by the instrument) was significantly higher among those with PIU than among those with normal Internet use. Specifically, "risk to self" among participants with a score above the cut-off point (clinical) was about 5 times more frequent among those with moderate PIU (29.5%) than among those with normal Internet use (5.9%). Chi-square found significant differences in all scales of CORE-OM ($p < .001$ in all cases)

With respect to the sex variable, 7.3% of women had scores over the cut-off point compared to 12.0% of men, meaning that "risk to self" was nearly twice as frequent among men as among women. The differences were statistically significant ($\chi^2 = 8.0$, $p = .005$) ($F = 7.53$, $p = .006$). There were, however, no differences according to the "area of study" variable ($F = 1.37$, $p = .232$), or to the technologies /v/ sciences and humanities variable ($F = 0.21$, $p = .641$).

Table 1.
Contingency table for IAT and CORE-OM scores.

	CORE-OM			
IAT Categories	Healthy	Clinical	χ^2	p
	%	%		
	Risk to Self			
Normal (0-30)	94.1	5.9	55.90	.000*
Mild (31-49)	87.9	12.1		
Moderate (50-79)	70.5	29.5		
	Risk to Others			
Normal (0-30)	74.4	25.6	59.70	.000*
Mild (31-49)	59.5	40.5		
Moderate (50-79)	38.8	61.3		
	CORE-OM Total			
Normal (0-30)	89.8	10.2	109.12	.000*
Mild (31-49)	74.4	25.6		
Moderate (50-79)	48.6	51.4		
	Subjective Wellness			
Normal (0-30)	66.6	33.4	42.03	.000*
Mild (31-49)	50.5	49.5		
Moderate (50-79)	39.7	60.3		
	Problems			
Normal (0-30)	88.6	11.4	103.80	.000*
Mild (31-49)	73.2	26.8		
Moderate (50-79)	48.7	51.3		
	Life Functioning			
Normal (0-30)	83.9	16.1	73.64	.000*
Mild (31-49)	70.3	29.7		
Moderate (50-79)	46.8	53.2		

*p<0.001

Figure 1 shows the specific percentages of participants with risk to themselves according to sex and Internet use. The percentage of women with risk to themselves was 3.7 times higher in the PIU-moderate group (21.7%) than in the group with normal Internet use (5.8%). Among men, the differences were greater, the percentage of men with risk to themselves being 5.6 times higher among those with PIU (44%) than among those with normal Internet use (7.9%).

An ANOVA was then conducted to compare "risk to self" scores between groups of people according to their Internet use (normal, mild, moderate) and sex. Statistically significant differences were found (F = 26.46, p < .001). The interaction between sex and Internet use in the "risk to self" variable was then analyzed using a parametric test (factorial ANOVA). Both the main effects (sex [F = 25.49, p < .001], Internet use [F= 32.14, p < .001]) and the interaction (F = 6.36, p = .002) were significant. The effect size was small (coefficient η^2 = .05).

A binary logistic regression analysis was then performed. The model obtained had a Nagelkerke's R^2 = .54 and a correct assignment of 96.4% (99.1% of participants without risk to themselves and 45.6% with risk to themselves) with the variables excessive use (IAT), lack of control (IAT), neglect of social life (IAT), like, life functioning (CORE-OM), subjective wellness (CORE-OM), depression (CORE-OM) and sex (see Table 2).

Table 2.
Logistic Regression. Dependent Variable: Extreme scores in Risk to self.

Variables in equation	β	Wald	Exp (B)	95% CI		*p*
				LL	UL	
IAT20 Excessive use	0.15	4.58	1.16	1.01	1.33	.032
IAT20 Lack of Control	-0.22	7.75	0.80	0.68	0.93	.005
IAT20 Neglect Social life	0.22	4.69	1.25	1.02	1.53	.030
Like	0.18	4.26	1.19	1.00	1.42	.039
CORE-Functioning	1.92	25.97	6.83	3.26	14.29	.000
Subjective wellness	-0.60	2.63	0.54	0.26	1.13	.105
Depression	1.82	41.67	6.21	3.57	10.83	.000
Sex (1)	-1.07	7.08	0.34	0.15	0.75	.008
Constant	-6.39	85.67	0.02			.000

Note. Number of variables= β =beta coefficient; Wald= contrast power static; CI95% = confidence intervals; CI= confidence interval; LL=lower limit; UL=upper limit.

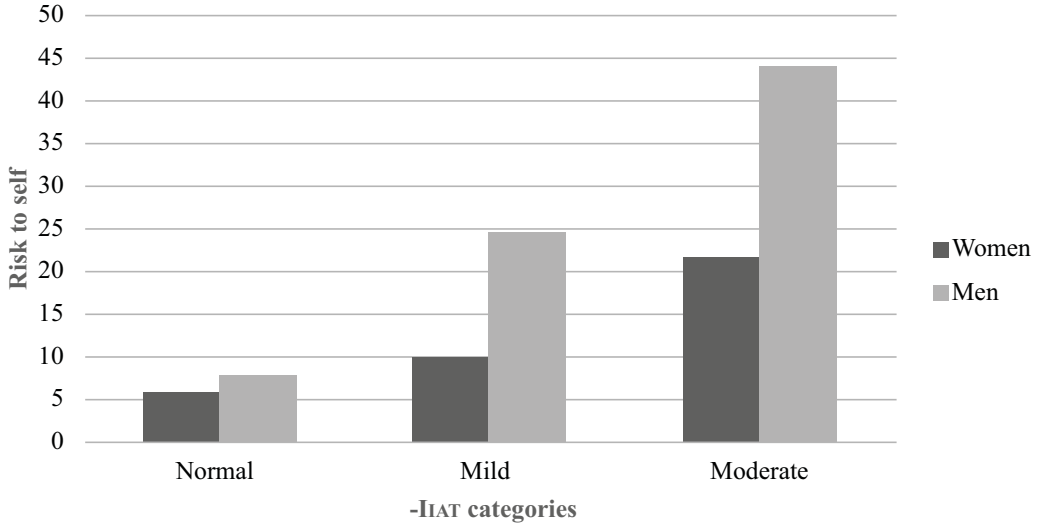

Figure 1.
Specific percentages of participants with "risk to self", by sex and Internet use categories.

Discussion

The aim of this work was to study the relationship between PIU and suicidal behavior in a sample of Spanish university students using the CORE-OM "risk to self" dimension, a scale that evaluates suicidal ideation and self-harm (although not specifying whether the self-harm is suicidal or not), and to assess whether differences exist according to sex and area of study.

As hypothesized, we found that "risk to self" was almost twice as frequent in men than in women. We also found a higher prevalence among those with problematic Internet use than among those with normal use. As there was an interaction between the two variables, the difference was greater in men than in women: 5.6 times higher among men with moderate PIU than among those with normal Internet use, as opposed to 3.7 times higher in women.

Some previous works conducted with adolescents in Spain produced results similar to ours. They include the study carried out by Arrivillaga et al. (2020) and the SEYLE project (Bousoño et al., 2017), in which a significant link was confirmed between maladaptive or pathological Internet use and suicidal ideation (Bousoño et al., 2017). Findings in other countries and in Spain regarding adolescents were confirmed with Spanish university students: that there is a significant relationship between PIU and an increased frequency of suicidal ideation (Fu et al., 2010; Kim et al., 2006; Lin et al., 2014) and self-harm among young people (Lam et al., 2009; Yu-Shian et al., 2018), with suicidal ideation being three to four times more frequent among people with PIU than among people with non-problematic Internet use (Cheng et al., 2018; Durkee et al., 2011). PIU must therefore be considered a relevant risk factor for the complex issue of suicidal behaviors.

In this regard, some authors, such as Durkee et al. (2011), have suggested that the link established between PIU and suicidal ideation may be due to increased access to websites with pro-suicide information. However, PIU is associated with several distress indicators which are also associated with suicidal behavior, including anxiety and difficulties in social relationships (Herruzo et al., 2022; Pino et al., 2022).

Regarding sex, comparative analyses showed that men presented a greater difference with respect to women in terms of risk to themselves and PIU. Although the data obtained are similar to those obtained in other studies indicating that PIU is more frequent in men than in women (Bousoño et al., 2017; Wasserman et al., 2015), the results regarding the risk of PIU by sex are contradictory (Durkee et al., 2016). On the one hand, some studies affirm that gender is not associated with the risk of PIU (Vigna-Taglianti et al., 2017), while on the other hand, some authors report that being male constitutes a risk factor for it (Chang et al., 2015; Fernández-Villa et al., 2015; Kilic et al., 2016).

The present study provided relevant information regarding the relationship between PIU and suicidal ideation in university students, but it was not possible to corroborate these results with other studies because no similar studies (i.e., with university populations) have been found in the scientific literature. The effect of Internet use on suicidality is unclear (Bousoño et al., 2017).

Likewise, the results obtained are in line with other previous studies reporting a link between Internet use and self-harm (15% of women and 26% of men) (O`Connor et al., 2014 as cited in Marchant et al., 2018).

In this regard, our model provided us with the specific characteristics of problematic Internet use that are predictive for "risk to self": excessive use, lack of control and neglected social life. These appeared together with the problems of functioning, depression, subjective wellness and sex. In short, the result is a profile of male problematic users of Internet with excessive internet use and social isolation, accompanied by a high weight of the depression and problematic life functioning variables (coping with everyday problems, social relations, etc.).

In future research, it would be interesting to look at the possible link with the functionality of PIU as an escape route, which may be equivalent to that of self-injurious or suicidal behaviors in the face of an individual's inability to cope with certain life situations. In this regard, PIU's role as an escape route would function in the same way as non-suicidal self-injury or other forms of self-injurious behaviors or thoughts in regulating negative effects (Kuehn et al., 2022), as also suggested by Kleiman et al. (2018). In accordance with the suggestion of Davis et al. (2002), young people would be those most susceptible to social exclusion, victimization and substance abuse and would use the Internet as a coping mechanism to relieve stress. It is then that they would become more vulnerable to Internet risks such as bullying, PIU, suicide websites, facilitation of suicide pacts and expedition of suicidal methods (Guan & Subrahmanyam, 2009; Szumilas & Kutcher, 2009). On the other hand, however, the Internet could also be used as a source of emotional support or as a tool to improve coping strategies for such vulnerable young people (Bousoño et al., 2017; Daine et al., 2013), as found in the study conducted by Tsitsika et al. (2014) where intensive use of social networks was associated with increased social competence. In this regard, online communication provides an ideal context for obtaining social support (Selfhout et al., 2009) by facilitating self-disclosure of intimate information (Valkenburg & Peter, 2007). Even so, when talking about PIU, the balance seems to tip towards the negative effects and Internet use in general is associated with an increased risk of self-harm, suicidal ideation and depression (Bousoño et al., 2017; Madge et al., 2011; O`Connor et al., 2012).

One of the limitations of this work is that the instrument used was not a scale designed specifically to address suicidal behavior, like the Paykel Suicide Scale (PSS; Paykel et al., 1974) which has demonstrated suitable psychometric properties in Spanish adolescents (Fonseca-Pedrero et al., 2018). However, CORE-OM (Evans et al., 2002) is nevertheless a scale that assesses risk to self within a questionnaire dealing with psychological problems, distress and life functioning. It also has convergent validity with other tests that assess psychological distress, such as the BDI-II (Beck et al., 1996) and the SCL-90-R (Derogatis, 1999). The CORE-OM (Evans et al., 2002), as its authors state, serves as a clinical indicator of the patient being 'at risk' to him/herself or others, evaluating suicidal ideation and self-injury.

In conclusion, in this study with a sample of young Spanish university students we have confirmed what was found in other countries, and in Spain with adolescents: the need to pay attention to PIU as a risk factor for suicidal behaviors like suicidal ideation, and in particular to focus on young males characterized by excessive Internet use, social isolation, and depressive symptoms, who belong to a higher "risk to self" category. Neither should we forget an aspect that has already been highlighted by prominent

authors on this subject: the multicausality of the phenomenon and the importance of contextual variables in that multicausality.

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