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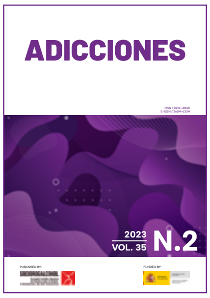

ORIGINAL

Problematic Internet Use and Psychological Problems among University Students with Disabilities

Uso problemático de Internet y problemas psicológicos entre estudiantes universitarios con discapacidad

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Abstract

Problematic internet use (PIU) among people with disabilities has received very little attention in scientific literature. The objective of this work is to study PIU among Spanish university students with disabilities, and determine whether it is related to the presence of psychological problems and discomfort. A total of 432 Spanish university students with disabilities from six universities participated in the study (35% motor disability, 22.7% sensory disability and 42.1% other disabilities, excluding psychical or intellectual disability). PIU in the sample was assessed using the Internet Addiction Test (IAT), while psychological problems were assessed using the Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). PIU prevalence was 6.3%, and significant differences were found by age (< 22 had a PIU prevalence five times higher), onset of disability (prevalence was 3.7 times higher in those with congenital disability) and main type of internet use (recreational). There were no differences by sex, level of education or type of disability. In all the dimensions measured by CORE-OM (psychological problems, subjective well-being, life functioning and risk of self-harm and harm to others), the prevalence of psychological problems was significantly higher among problematic internet users. In conclusion, university students who are disabled from birth (regardless of their type of disability and sex), under the age of 22, and use the internet mainly for social networking and recreational purposes are at greater risk of psychological distress and are more vulnerable to problems like anxiety and difficulties with social relationships.

Key words: students with disabilities, internet addiction, psychological problems, life functioning, wellness

Resumen

El uso problemático de internet (UPI) entre las personas con discapacidad ha recibido muy poca atención en la literatura científica. El objetivo de este trabajo es estudiar el UPI entre los estudiantes universitarios españoles con discapacidad, y si se relaciona con malestar y problemas psicológicos. En el estudio participaron 432 universitarios españoles con discapacidad de seis universidades (35 %: discapacidad motora, 22,7 %: discapacidad sensorial y 42,1 %: otras discapacidades, excluyendo la discapacidad psíquica o intelectual). El UPI se evaluó mediante el Test de Adicción a Internet (IAT), mientras que los problemas psicológicos se evaluaron mediante el cuestionario Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM). La prevalencia del UPI fue del 6,3 %, y no hubo diferencias estadísticamente significativas por sexo, tipo de discapacidad o estudios. Sí hubo diferencias en función de la edad (< 22 mostraron una prevalencia 5 veces mayor), origen de la discapacidad (discapacidad congénita mostraron una prevalencia 3,7 veces mayor) y tipo principal de uso (recreativo). La prevalencia de problemas psicológicos es significativamente mayor entre los usuarios problemáticos de Internet, en todas las dimensiones medidas por el CORE-OM (problemas psicológicos, bienestar subjetivo, funcionamiento general y riesgo de autolesión y de daño a otros). En conclusión, los estudiantes universitarios con discapacidad desde el nacimiento (independientemente del tipo de discapacidad y del sexo), menores de 22 años y que utilizan Internet principalmente con fines recreativos y las redes sociales tienen mayor riesgo de sufrir trastornos psicológicos y mayor vulnerabilidad a problemas como ansiedad y dificultades en las relaciones sociales.

Palabras clave: estudiantes con discapacidad, adicción a Internet, problemas psicológicos, funcionamiento, bienestar

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Over the last three decades, use of the internet has exploded. It now constitutes such a high percentage of everyday activity that it is significantly modifying the dynamics of social relationships, forms of communication, mobility, etc. (Hernández, Ortiz & Uribe, 2013). However, parallel to this increase in the use of new technologies, concern is growing about where exactly the boundaries lie between the appropriate and inappropriate use that is made of them. A number of different terms have emerged in scientific literature to refer to this phenomenon. These include "internet addiction", "pathological internet use", "problematic internet use" (PIU), and "excessive internet use" (Echeburúa & Corral, 2010), and all of them refer to an inability to control the use of the internet resulting in psychological, social, school or work difficulties in a person's life (Spada, 2014; Zhou, Li, Li, Wang & Zhao, 2017). The very existence of internet addiction, however, is today still a matter of debate. The DSM-5 classification (American Psychiatric Association, 2013), although it recognizes Non-Substance Related Addictive Disorders within its category of Substance Related and Addictive Disorders, only specifies the pathological gambling disorder, leaving other behavioral addictions as phenomena to be studied in future research. The ICD-11, which includes online gambling and video game disorders, takes the same approach (WHO, 2019).

At the same time, the issue has attracted growing attention throughout this period from the scientific community, with an exponential increase in the number of publications dedicated to internet addiction or PIU (Kuss, Griffiths & Binder, 2013; Lucena, Raya-Trenas, Herruzo & Herruzo, 2019; Ruiz-Olivares, Lucena, Pino & Herruzo, 2010). This is reflected in the profusion of instruments that have emerged for evaluating how different technologies (mobile phones, internet, social networks, video games, etc.) are used, more than 20 of which specifically focus on internet use (Kraus & Rosenberg, 2014).

Despite this general increase in research into both the normal and the problematic use of technologies (Carbonell, Fúster, Chamorro & Obsert, 2012), certain groups of people who are particularly affected by the changes in living habits brought about by such technologies have received very little attention in literature. One such group is that of people with disabilities (Suriá, 2012a). The specific characteristics of these people and their living conditions, which in some cases place them at risk of social isolation, make it necessary to examine how this group is experiencing the great social change of the ICT revolution and establish whether they are being negatively impacted by the use and abuse of technologies to a greater or lesser extent than the "non-disabled" population (Duplaga & Sluzc, 2019). The new technologies have clearly helped people with disabilities to achieve greater autonomy and independence (Igual, Plaza, Medrano & Rubio, 2014). Mobile phones, for example, facilitate contact with people who are not in the same physical space, both for people with and without disabilities (Campbell & Ling, 2009; Perry, O'Hara, Sellen, Brown & Harper, 2001), and can be useful in eliminating some of the barriers faced by people with reduced mobility thanks to apps which promote autonomy, facilitate daily tasks, and thus reduce the sense of stigmatization associated with being disabled (Chib & Jiang, 2014). In the same vein, Söderström (2009) argues that the use of smartphones has facilitated the construction of new identities in people with physical disabilities, allowing them to "hide" and thereby increasing their perception of empowerment, broadening their social relationships, and helping to expand their comfort zones. Söderström also reports that people with disabilities value mobile phones as essential tools of communication to a greater extent than people without disabilities, given that they allow them to request help in certain everyday situations which people without disabilities probably do not experience as often (Söderström, 2011).

In the literature, however, very little attention has been paid to the internet-use-related problems experienced by people with disabilities. Studies have focused almost exclusively on intellectual disability or the phenomenon of cyberbullying (Simpson, Rose & Ellis, 2016), which is suffered by disabled people of different ages (Heiman, Olenik-Shemesh & Eden, 2015; Jenaro, et al., 2018), the harassment being greater the more "visible" the disability is (Kowalski, Morgan, Drake-Lavelle & Allison, 2016). In the case of cyberbullying, ICTs are a medium through which violent behavior occurs, but the literature has scarcely addressed the question of the normal or problematic use of technologies by disabled people, regardless of possible cases of addiction. Lathouwers, de Moor & Didden, (2009) studied how 97 physically disabled adolescents accessed and used internet in the Netherlands. They found no differences between how physically disabled and non-disabled adolescents accessed internet, and the most common online activities were similar for both groups, although abuse was not studied in depth. Suriá (2015), on the other hand, compared abusive internet use in a sample of young people with and without disabilities and found greater technology abuse among people with motor disabilities than among people without disabilities (Suriá, 2012b), both groups showing similar levels of use, around 90%, during adolescence (Adecco, 2017). The sample used in Suriá's study, however, was small and the analysis did not address how the results related to psychological problems found in people without disabilities (Spada, 2014; Zhou et al., 2017). As several critical reviews have already highlighted (Aponte, Castillo & González, 2017; James & Tunney, 2017) the most relevant factor from a social point of view is the effect on people's well-being.

Given, then, that all people, including those with some kind of disability, are exposed to the beneficial and/or harmful effects of internet use, and in view of the scarce amount of research carried out into PIU among disabled people, the objective of this work was to study PIU among Spanish university students with disabilities, and determine whether it is related to the presence of psychological problems and discomfort.

Method

Participants

A total of 432 Spanish university students with disabilities participated in the study. 35% of them had a motor disability, 22.7% a sensory disability and 42.1% other disabilities (not including cognitive disabilities). 25% had been disabled since birth, the disabilities of the other 75% being acquired. 54.4% of the sample were women and 45.6% men. The average age was 41.90 years (SD = 13.77). The sample's homoscedasticity was checked using the chi-square test, comparing groups formed according to disability type and sex. Since no significant results were obtained, it can be said that the sample was homogeneous in these two aspects (χ^2= 2.70; p= .257). Participants were recruited via an e-mailed invitation to participate sent by the Disabled Student Services of 8 universities (the UNED—Spain's National Distance Learning University—and the universities of Valencia, Cadiz, Malaga, Jaén, La Laguna, Barcelona, and the Basque Country) to the people registered on their databases, together with a link to a website. Of a total of 560 people who accessed the website, 23% declined to respond to the survey. With respect to subject areas, 24.4% of the participants were students of Humanities; 41.4% studied Social, Economic and Legal Sciences; 11.9% studied Sciences and Technologies and 22.4% studied Health Sciences. Overall, then, 34.2% were studying sciences and technologies and 65.8% were studying social sciences and humanities.

Instruments

The first part of the survey included a series of questions about the types of disability suffered by the participants, the nature of their disability (inborn or acquired) and the years elapsed since its onset. The questions about disability type included different options (auditory, visual, physical and others). The students with disabilities were contacted through the disability support services of the participating universities. To access such services, the type and degree of a student's disability must have been accredited by a recognized health care institution.

A set of questions was also included about the participants' use of the internet (percentage of time online dedicated to leisure, work, studies, and social networking). To facilitate responses, answer options were established as percentages (0-25%, 25-50%, 50-75%, 75-100%). When a participant gave a 75-100% response, he or she was considered to be making primary use of the internet for the purpose in question. Questions about other sociodemographic characteristics were also included (age, sex, average grade in the previous year, course, specialization, university).

The following instruments were also applied:

Young's Internet Addiction Test (1998), adapted for Spanish speakers by Carbonell et al. (2012) and validated by Fernandez-Villa et al. (2015a) and Pino, Herruzo, Raya, Ruiz-Olivares & Herruzo (2020). 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 items, evaluated using a six-point Likert scale (0 = Never; 1 = Almost Never; 2 = Occasionally; 3 = Frequently; 4 = Often; 5 = Always). Literature reports internal structures ranging from one to six dimensions. In the present study, the Exploratory Factorial Analysis found a three-dimensional structure (CMIN/DF=3.159; AGFI = 0.95; CFI = 0.903; NFI = 0.865; IFI= .904; TLI = 0.876; RMSEA [90% CI] = 0.073 [0.066–0.081]). The author (Young, 2011) proposes a score of 30 as the boundary between normal and pathological use. Other researchers, like Jelenchick, Becker & Moreno (2012) put the borderline at 40 points. Given the controversy about the number of existing factors, in this work we decided to analyze PIU based on a cut-off point of 40, considering those who obtained scores of 40 or more as problematic users, as has been done in other studies with Spanish populations (Fernández-Villa et al., 2015a; Fernández-Villa et al. 2015b). The Cronbach alpha internal consistency coefficient is close to .90. In the present study, the alpha coefficient for the sample was .925.

The Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM), by Evans et al. (2002), adapted for Spanish populations by Trujillo et al. (2016). This is a self-report questionnaire made up of 34 items that evaluate the individual's status based on four dimensions: 1) Subjective well-being/discomfort (4 items); 2) Problems/Symptoms (12 items, measuring anxiety, depression, trauma and physical symptoms); 3) General functioning (12 items, evaluating intimate relationships, social relationships and levels of daily functioning); and 4) Risk (4 items serving as clinical indicators of suicide attempts and self-harm, and 2 items for predicting acts of aggression against third parties). Mean scores below 1 indicate healthy levels. This test's psychometric properties have demonstrated acceptable levels of internal consistency (alpha values of between .75 and .90) and sensitivity in the measurements obtained (Evans et al., 2002) and it has been used in numerous clinical (Connell et al., 2007; Palmieri et al., 2009) and university (Connell et al., 2007; Botella, 2006) contexts.

Procedure

The study procedures were carried out in compliance with the Declaration of Helsinki. Once the study had been approved by the Institutional Review Board (Ethics Committee) of the Andalusian Regional Government (ref. 3050, record 249), the Disabled Student Support Services of the universities were contacted. These services e-mailed their users, inviting them to click on a link to take part in a survey about the use of new technologies by students with disabilities. In the e-mail and on the first page of the questionnaire, they were informed that by completing the survey they were consenting to the use of their responses exclusively for research purposes and with complete confidentiality, and that no data other than their responses to the survey would be recorded. To obtain informed consent, the text also read: "By filling out this survey you agree to voluntarily participate in this study. You may refuse to participate in the study at any time without giving any reasons."

Data Analysis

As the structure of the instrument had been controversial and had not been validated with disabled students, we first assessed its underlying dimensions. For this purpose, we used the Kaiser-Mayer-Olkin Measure of Sampling Adequacy (KMO = 0.938), which verified the sample's suitability. Bartlett's sphericity test x2 = 3434.76; p< .001 indicated a significant relationship between the variables and the feasibility of applying an exploratory factor analysis. A principal component analysis with Varimax rotation and Kaiser normalization was conducted to group the 20 items of the IAT into three components with auto-values greater than 1, which explained 47.80% of the variance. A confirmatory factor analysis (CFA) of the sample was then carried out using the AMOS.18 program, the fit values obtained being acceptable or good (Chi2=470,753, p<.001; minimum discrepancy divided by degrees of freedom CMIN/DF=3,159 (< 5); Adjusted Goodness of Fit Index: AGFI = 0.95 (> .9); Comparative Fit Index CFI = 0.903 (> .9); IFI= .904 (> .9); Tucker-Lewis Index TLI = 0.876 (close to 1); parsimony fit-index: root mean square error of approximation RMSEA [90% CI] = 0.073 [0.066-0.081] (< .08)).

Prevalences were calculated with their respective 95% confidence intervals, while numerical variables were analyzed by calculating mean and standard deviations. The relationship between PIU and psychological, social, and school difficulties and other variables was studied with bivariate and multivariate logistic regression models, calculating Odds Ratios with their respective 95% confidence intervals and making adjustments for sex, age and degree. These analyses were performed using the SPSS statistical package.

Results

As stated in the Analysis section, an exploratory factor analysis was first carried out, followed by a confirmatory analysis to check the factorial structure and adjustment of the questionnaire, which had not been used before with disabled people. Given the controversy regarding its structure, however, in the present work we used the score for the complete questionnaire, the cut-off point for PIU being 40, as mentioned in the Instruments section.

As can be seen in Table 1, PIU prevalence in the sample was 6.3%, with no statistically significant differences by sex and type of disability. With regard to age, participants under 22 had a prevalence (Odds Ratio: OR) five times higher than those who were older. In participants who had been disabled from birth, PIU prevalence was 3.7 times higher.

As can be seen in Table 2, the prevalence of CORE-OM scores above the cut-off point for risk of clinical problems (clinically significant discomfort) was significantly higher among problematic internet users, in all the dimensions measured by this instrument, than among those with normal values, with odds ratio values ranging from 3.18 for

Table 1. ***PIU prevalence by sociodemographic variables.***

		N	n	%	OR	95% CI	B	*p*
Disability type	Motor	142	9	6.3	1.203	.464-3.117	.185	.704
	Sensory	87	6	6.9	1.317	.453-3.828	.275	.613
	Other	169	9	5.3	1			
Age	<22	41	8	19.5	1			
	>= 22	357	16	4.5	.194	.077-.486	-1.642	< .001
Origin	Inborn	90	11	12.2	1			
	Acquired	274	10	3.6	.272	.111-.664	-1.302	.004
Sex	Male	181	12	6.6	1			
	Female	217	12	5.5	1.213	.531-2.770	.193	.647
Studies	Sciences and -Tech	124	8	6.5	1			
	Hum-Soc/Econ/Leg	238	14	5.9	.906	.370-2.223	-.098	.830

Note. N: Non-problematic users of Internet. n: Problematic Users. %: Percentage of problematic users. OR: Odds Ratio. B: Coefficient B.

Table 2. ***Relationships between PIU (IAT) and Psychological Problems (CORE-OM).***

		N	n	%	OR	95% CI	B	*p*
CORE-OM	Non-clinical	264	8	3	1			
	Clinical	107	11	10.3	3.667	1.432-9.391	1.387	.007
Problems	Non-clinical	256	8	4.1	1			
	Clinical	116	12	10.3	3.577	1.421-9.006	1.275	.007
Anxiety	Non-clinical	284	8	2.8	1			
	Clinical	89	12	13.5	5.377	2.122-13.621	1.682	< .001
Depression	Non-clinical	258	8	3.1	1			
	Clinical	114	12	10.5	3.676	1.460-9.260	1.302	.006
Traumatic Symptoms	Non-clinical	265	9	3.4	1			
	Clinical	107	11	10.3	3.22	1.338-7.478	1.170	.006
Subjective Wellness	Non-clinical	257	6	2.3	1			
	Clinical	115	14	12.2	5.396	2.083-13.977	1.686	.001
General Functioning	Non-clinical	264	8	3	1			
	Clinical	107	11	10.3	3.560	1.484-8.541	1.270	.004
Social Relationships	Non-clinical	279	6	2.2	1			
	Clinical	92	13	14.1	6.825	2.580-18.053	1.921	< .001
Close Relationships	Non-clinical	278	0	0	1			
	Clinical	94	2	2	3.187	1.388-7.317	1.159	.006
Risk	Non-clinical	270	7	2.6	1			
	Clinical	102	13	12.7	5.126	2.059-12.765	1.634	< .001

Note. N: Non-problematic users of Internet. n: Problematic Users. %: Percentage of problematic users. OR: Odds Ratio. B: Coefficient B.

Table 3. ***Relationship between PIU (IAT) and type of Internet use.***

Type of use	Percentage of use	N	n	%	OR	95% CI	B	*p*
Work & study	0-75%	272	22	7.5	1			
	75-100%	102	2	1.9	.141	.027-. 740	-1.959	.021
Social Networking	0-75%	351	16	4.3	1			
	75-100%	23	8	25.8	7.630	2.484-22.651	2.015	< .001
Leisure	0-75%	369	19	4.9	1			
	75-100%	5	5	50	10.865	2.494-47.335	2.386	.001

Note. N: Non-problematic users of Internet. n: Problematic Users. %: Percentage of problematic users. OR: Odds Ratio. B: Coefficient B.

close relationships to 6.8 for social relationships, and from 5.39 for subjective wellness to 5.37 for anxiety.

The relationship between different types of internet use (mainly for work and study, for social networking, and for other leisure activity) was also explored (see Table 3). 50% of those who spent more than 75% of their internet time engaged in recreational activity had PIU, compared to only 4.9% of those who spent less time on recreational usage. In the case of people who used the internet mainly for work and studies, however, the result was reversed, with 1.9% of those who used it more than 75% of the time for studying having PIU, and the percentage for those who used it less than 75 % of the time for work and study rising to 7.5%.

Discussion

The objective of this study was to analyze Problematic Internet Use among university students with disabilities and determine whether it is related to the presence of psychological problems and discomfort. The results showed that students over 22 years of age with an acquired disability and who mainly use internet for work and/or studying have less risk of PIU, regardless of their type of disability, sex, or branch of studies. In contrast, those under 22 with an inborn disability and who mainly use internet for social networking and other recreational activities have a higher risk of PIU. PIU was also found to be associated with a higher prevalence of psychological problems and distress.

The rate of PIU among disabled people was found to be 6.3%, a figure similar to that obtained by Fernández-Villa et al. (2015a) using the same instrument in university students without disabilities. This contradicts the results of Suriá (2015), who found a higher level of problematic use among disabled students than among non-disabled students. These differences, however, may be due to the small size of Suriá's sample (n=128) and the fact that she used a different instrument, namely the "Internet-Related Experiences Questionnaire" (CERI) developed by Beranuy, Chamarro, Graner & Carbonell (2009). This questionnaire uses the DSM-IV-TR criteria for substance abuse and pathological gambling and, like the IAT used in the present study, has been validated for a Spanish population, so it is very likely that the differences found have to do with the small size of the sample and/or the sampling method ("snowball").

Our results showed no difference with regard to disability type. This also contradicts the results obtained by Suriá (2015), which showed a higher prevalence of PIU among those with motor disability. More research is needed to help clarify these discrepancies but, again, they are probably explained by Suriá's use of the "snowball" sampling method. On the other hand, our study found significant differences according to the origin of the disability, with a higher prevalence among those with inborn disability than among those with acquired disability. The figures we obtained are inevitably dynamic because of the instruments we used and because PIU is a changing and probably growing phenomenon. It is a problem that clearly affects a significant percentage of the population with disabilities, so more research is needed.

Given the scarcity of literature on the problem of PIU among people with disabilities, our study is one of the first to have provided data that throws light on the impact the new technologies are having on this group. Duplaga & Sluzc (2019) found that internet use was related to feelings of happiness and better mental health, but in their study they only included a dichotomous question about whether or not people used the internet. Our study, however, is based on an instrument that directly measures PIU. The results obtained by Duplaga & Sluzc (2019) confirm that non-problematic internet use has a positive effect in the sense that it is likely to facilitate greater autonomy, independence (Igual et al., 2014), and contact with people who are not in the same physical space (Campbell & Ling, 2009; Perry et al., 2001), and may also be useful in eliminating some of the barriers faced by people with reduced mobility (Chib & Jiang, 2014).

Our study also shows that people with disabilities who display PIU have significantly more psychological problems than those whose use of such technology is normal or more controlled. In this respect, Kraut et al. (1998) reported a positive correlation between internet use and depression, loneliness, and stress. Miller (2008) also found a significant negative relationship between frequency of video game use and degrees of well-being in people with spinal cord injuries. The present study confirms the relationship found in other studies between PIU and the presence of psychological distress and problems like depression, anxiety, and difficulties with social relationships in the disabled population.

It is noteworthy that in all the dimensions of psychological distress studied with the CORE-OM, an instrument which provides cut-off points to indicate the presence of problems, prevalence is significantly higher among those with PIU. The data obtained in this study show that the prevalence figures for psychological distress and anxiety are also more than five times higher. The figures obtained for the risk of self-harm or harm to others (Risk), which is also 5 times higher among those with PIU than among those whose use of internet is normal, reinforce the idea of PIU as a real problem worthy of attention, without even entering into the controversy of whether or not excessive internet use should be considered an addiction.

We also found that problematic social relationships are more than six times more frequent among those who have PIU than among those who do not. Taking into account the data obtained by Duplaga & Sluzc (2019) and Campbell & Ling (2009), this seems to suggest that the appropriate use of the internet favors inclusion, but that PIU favors isolation.

In short, the relationship between, on the one hand, psychological distress, psychological problems, bad social relationships, and anxiety and, on the other, problematic internet use seems to indicate that internet "addiction" may be fulfilling a distress avoidance function through social isolation or through experiential avoidance, as already suggested in other studies (James & Tunney, 2017; Lucena et al., 2019), and that this may be encouraging more isolation and therefore more addiction. This would be consistent with the higher prevalence of PIU found among people who are disabled from birth and among those who use the internet primarily for other, recreational purposes. However, the cross-sectional nature of the study prevents us from establishing whether it is psychological problems that lead to PIU or PIU that leads to psychological problems, or whether the two types of problem are mutually reinforcing, so further research is needed based on longitudinal designs.

In conclusion, university students under the age of 22, with inborn disabilities (regardless of type) and who use the internet mainly for social networking and recreational purposes are at greater risk of psychological distress and problems.

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Conflict of interest

The authors declare no conflict of interest.

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