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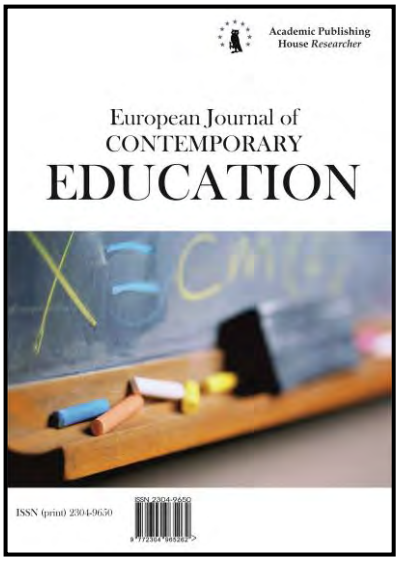

Addiction Levels Toward the Internet: Empirical Evidence in College Students at Instituto Tecnológico De Sonora, México

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Abstract

The purpose of the study focused on determining the level of internet addiction in university students and whether this differs by gender. Participants were 463 students who, at the time of applying the survey, were taking any of the school semesters in the different academic offerings at ITSON. The instrument used for the field work was Young's IAT scale (1998) and the statistical procedure for the measurement of data that allowed identifying the variance of the study phenomenon was exploratory factor analysis with Polychoric correlation matrices and ANOVA for gender difference contrast.

The main findings point to the identification of a factorial structure of four factors that explain 50.35 % of the variance, in addition the highest percentage of cases that measure the level of internet addiction, was in the mild and moderate range. Finally, it was shown that there is no gender difference in addiction.

The authors can point out that, because the participants were university students, this can be beneficial, since the institution where these young people study has the power to generate strategies aimed at preventing internet addiction. As an example of this, General training courses can include activities to develop a culture of proper use of the internet, taking advantage of the resource without making excessive use of it. Implementing strategies to prevent addiction, as well as programs to recover from an internet addiction, in themselves are projects that can be developed by the students themselves with the guidance of professionals on the subject.

Keywords: Internet, addiction, ICT, net-users.

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1. Introduction

The advancement of Information and Communication Technologies (ICT), with the increase of electronic devices with screens, has transformed, not only communication, education and entertainment, but also individual and social behavior. Nowadays, it is common for students to complete their school assignments on laptops, with multiple windows open. Simultaneously they are chatting with friends via instant messaging, looking for information for their tasks, interacting on social networks, playing games, dating, or harassing others, among other activities (Rich et al., 2017).

The internet provides young people with a way to get rid of the frustration caused by pressure from parents, the school environment, friends and acquaintances. Also, the internet becomes an escape from responsibilities that increase with age. However, emotional distance is gradually increased and with it the communication in real life, affecting social and personality formation (Neverkovich et al., 2018).

Although the internet brings multiple benefits, there are also individuals who exhibit addictive behaviors and this is generating concern in government agencies and associations focused on physical and mental health. Addiction seems to be increasing in recent years; including different types of excessive behaviors and not just substance abuse (Kuss, Pontes, 2018).

The term addiction refers to the excessive use of a substance or extreme participation in behavior. On the other hand, clinically it can mean loss of control and deterioration in function. Research and clinical experiences suggest that extreme behaviors can cause significant problems, regardless of activity. Furthermore, as the frequency and duration of the behaviors increase, psychological distress, decreased social, financial and occupational functioning, and even physical deterioration can be generated (Petry, 2016; Sussman, 2017).

A group of so-called drug-free or behavioral addictions has emerged in recent decades. This classification includes pathological gambling, compulsive shopping, addictions to technologies (television, internet, social networks, video games), addiction to work, sex and relationships, obsession with healthy food and physical training syndrome. These types of addictions share characteristics with addictions to substances, such as desire, dependence, tolerance and withdrawal. However, some of these drug or behavioral addictions are controversial and are considered normal, though with extreme behavior (Marazziti et al., 2016; Bisen, Deshpande, 2018; Sussman, 2017).

In behavioral addictions, both impulsive and compulsive behaviors are important precursors. Impulsiveness often occurs at the onset of addiction, while compulsive behavior contributes to its permanence (Cuzen, Stein, 2014).

Today ICTs make individuals more vulnerable to different types of addictions. Using the internet for hours encourages behavioral addictions such as online games, compulsive shopping and cybersex, among others. In contrast, interventions to eliminate an addiction can also be accessed through the internet. For this reason, Suresh and Deshpande (2018) affirm that the internet contributes positively and negatively to behavioral disorders, such as behavioral addictions.

Internet addiction is difficult to identify because the use of the web offers multiple benefits. It is common to use the internet to communicate, make commercial transactions, get information, among others. In contrast, addiction to alcohol and other chemical substances does not provide benefits nor are they necessary resources for personal or professional life, and they do not promote health. Consequently, signs of internet addiction can be hidden or justified as a necessary activity (Young, 2017a).

Some addiction specialists point out that the excessive use of video games, social networks and other activities that are carried out while connected to the internet can affect the brain in the same way that the use of narcotics or alcohol does. However, they also point out that overuse of technology is generally associated with an underlying condition, such as anxiety, depression, or attention deficit disorder (Ladika, 2018; Courtwright, 2019).

In this regard, the Information Resources Management Association (IRMA) points out that addiction to technological devices, the internet, social networks and virtual communities can cause mental health problems. These include low self-esteem, feelings of inadequacy, depression, and anxiety. In turn, there are physical problems such as dry eyes, carpal tunnel syndrome, back pain, neck pain, severe headaches, irregularities in meals, and sleep disorders (IRMA, 2019; Rokkum et al., 2018).

ICT addiction has been defined or conceptualized in different ways. However, in all of them the excessive and problematic use of the internet is considered. When the internet constitutes the main activity in the daily life of an addicted individual, this causes anguish and loss of control, affecting health and personal and social well-being (Lopez-Fernandez, 2019). Moreover, Khan (2018) points out that this addictive practice should be classified as a psychological disorder.

It is necessary to distinguish between internet addiction and excessive use. Online hobbies, professional and academic commitments are generally a part of life, even if one spends too much time on them. However, to be considered an addiction, the activity must limit life by interfering with daily activities and general functioning (Kuss, Pontes, 2018; Wallace, 2014).

Many of the explanations of addiction as a disease mention the individual's loss of self-control. A primary aspect in today's society is the proliferation of hedonism and the conception that all people have the right to pleasure makes it difficult to maintain self-control. Furthermore, modern cultures, where immediate gratification is available in multiple ways through ICT, contribute to extreme behaviors (Reinarman, Granfield, 2015).

In the past 60 years, sociology has investigated addiction. Finding that addictive behaviors are often the product of psychological, economic, political, social and cultural factors. Therefore, to modify an addictive behavior, the conditions from which it arose must be changed (Hammersley, 2018). Behavioral addiction is a fact that must be faced through preventive, therapeutic and research programs.

Internet addiction is a subsequent step to abusive use, based on the frequency of use and mainly on the change in lifestyle habits. The advancement of ICT with the possibility of connection anywhere and at any time turns digital devices into powerful reinforcers that promote addiction (García, 2013).

It is therefore essential to identify internet addiction in young people as a first step in order to modify the conditions that contribute to that behavior. Preliminary to the literature review, they are established as questions: Is there internet addiction in higher education students in Sonora? Are there gender differences in levels of internet addiction?

2. Discussion

Internet addiction depends on many factors. In each specific case there is a unique combination of inherited characteristics (structure of the nervous tissue, secretion, degradation and reception of neuromeditors) and extra-environmental factors such as those related to the family, social and ethno-cultural (Tereshchenko, Kasparov, 2019).

A meta-analysis of 70 studies conducted in China that included 68,964 participants, the relationship between internet overuse, well-being, life satisfaction, positive or negative emotions, geographic location, age, and gender was investigated. The findings show that students with excessive use of the internet presented more negative emotions, manifested less well-being, less satisfaction in life and fewer positive emotions. A moderate link was found between Internet overuse and geographic location, age, and gender. On the other hand, it was determined that the relationship between excessive use of the internet with well-being and positive emotions is stronger in younger students than in university students.

Also, the negative relationship between well-being, life satisfaction and positive emotions is stronger where the samples have a greater number of women (Lei et al., 2019). The effect on cognitive performance of people with Internet use problems was studied by Ioannidis, Hook, Goudriaan, Vlies, Fineberg, Grant and Chamberlain (2019). A meta-analysis was performed with 40 studies published from 1995 to 2017, which included a total of 2,922 participants. The findings point to a significant deterioration in inhibitory control. In turn, a decrease was found in various neuropsychological domains regardless of the participant's geographical location, supporting the intercultural and biological validity of the finding. Also, a common neurobiological vulnerability in behaviors was determined for any excessive use that occurs on the internet.

In Spain, Colombia and the United States, an investigation was carried out with university students comparing the perception of young people's Internet use problems. The works that were included are within the period from 2006 to 2017. The results indicated that internet use is perceived as a growing problem. However, it has stabilized in recent years, possibly due to the normalization and integration of new technologies into daily life. Social media motivated the increase in the negative perception of internet use according to the reviewed works. On the other

hand, the use of the internet is different between women and men, the former being the ones that perceive a greater negative impact (Carbonell et al., 2018).

In a study carried out in Spanish-speaking countries, four scales were applied through the internet to 1,276 people of different ages. The results indicated a high frequency (50 %) of problems due to use and excessive immersion in ICT. This is related to behavioral disorders, emotional and social difficulties that are reflected in the activities of daily life. In addition, there are symptoms that can trigger mental health problems, as well as increase stress levels (Pedrero-Pérez et al., 2018).

In the city of Austin, in the United States, government entities evaluated the technological integration of the population. The objective was to determine how ICTs are related in the mobilization of information to achieve life goals through competence in the use of technology and dependence on them. In the investigation, four scales were applied to evaluate the constructs technological dependence, technological competence, self-efficacy in obtaining information and confidence in the sources of information. Also, the number of years using technology and sociodemographic characteristics was used as control variables.

This study has been carried out every three years since 2011. The sample consisted of 997 people over the age of 18 who agreed to participate and provided the information. The restrictions indicated that only one person per family could participate. The findings indicated that there are multiple factors involved. Some forms of dependency were found towards certain uses of technology that can negatively influence technological competence. In addition, it was found that technological dependence can decrease the positive influence of technological competence on the self-efficacy of information acquisition. Regarding confidence in online information sources, it was determined that greater competence predicts less confidence in online information, in contrast, greater confidence leads to greater dependence (Park et al., 2019).

In the Basque Country, in Spain, a scale was created to identify the risk of adolescents to addiction to the internet and social networks. 2417 adolescents between 12 and 17 years of age participated in the research. The instrument consisted of 29 items and four dimensions were formed by exploratory factor analysis. The internal consistency of the scale measured with Cronbach's alpha was .90 and the test-restest correlations ranged from r = .76 to r = .88, where the temporal stability of the test is manifested. The factors that explained 46.48 % of the variance were symptoms-addiction, social-use, geek-features and nomophobia. Also, they found positive correlations between addiction to social networks and the internet with neuroticism, extraversion, disinhibition, narcissism, social anxiety and anxious attachment style; and negative correlations with self-esteem and confident attachment (Peris et al., 2018).

To identify addiction to internet use Young (1998) developed an 8-question questionnaire adapted from the pathological gambling criteria defined by the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV). The scale also included sociodemographic questions to identify characteristics of the participants. The survey was applied nationally in the United States by telephone (to those who responded to advertisements published in newspapers and to advertising in different schools) and through the internet (in support groups of internet addicts and to those who were searching for the words "Internet addiction").

596 valid surveys were obtained in three months, of which 396 were determined to be addicted to the internet, by answering yes to five or more of the questions. The results indicated that internet addicts were new to the internet, therefore they express that it is possible that new internet users have a higher risk of developing addictive behaviors with the internet. Subsequently, Young (2017b) modified the scale and constructed a 20-item questionnaire called the Internet Addiction Test (IAT).

Internet addiction and its relationship with economic indicators was studied in nine countries involving 3,279 people. Young's scale (2017b) on internet addiction was used and each country was characterized with social and economic indicators. The results showed a positive correlation with economic well-being, social progress, and human development. On the other hand, a negative correlation was found with human well-being, health, protection and security (Blachnio et al., 2019).

An investigation was carried out in Turkey to determine the validity and the internal reliability coefficient of the Young's scale (2017b). 480 children between 12 and 17 years of age participated in the research. The results indicated that the coefficients obtained are in ranges and appropriate. Furthermore, it was found that the items were grouped into four factors. The factors

were identified as difficulty in having control, social isolation, feelings of deprivation and rejection of daily tasks (Keser et al., 2013).

In South Korea, work was carried out to understand internet addiction and its relationship with the personal characteristics of each individual, variables about school and family, and the environment. The work involved 1,628 adolescents from 56 regions of Seoul and Gyeonggi-do, representing urban and rural districts. The scales that were applied included Young's (2017b) addiction to the internet, of psychological variables, family and school factors, perceived characteristics of the internet, environmental factors (accessibility to cyber cafes and exposure to game advertisements). The results showed that 72 % of the participants had a moderate or severe internet addiction.

On the other hand, environmental factors had a greater influence than family and school factors. In turn, participants with internet addiction started using it at an earlier age, had higher levels of depression, compulsiveness, aggressiveness, less family cohesion, greater access to cyber cafes and high exposure to game advertisements. Regarding the characteristics of the internet that are associated with internet addiction, high levels were obtained in the factors of entertainment, anonymity and interpersonal relationships (Chung et al., 2019).

In the Mexican context, Young's scale (2017b) was applied to compare the degree of internet addiction among university students. The participants were 66 students from the National Polytechnic Institute in Mexico City and 58 students from the Autonomous University of the state of Nayarit. In the results, it was determined that there was a difference in the means, being more representative that of the National Polytechnic Institute (Ruiz et al., 2017).

Due to the arguments previously presented, a question is posed in the following terms: What is the level of internet addiction of university students? Thus, the objective of the study is to determine if there is internet addiction in university students and if it is possible to identify a set of latent variables that can explain the phenomenon. Therefore, the following hypotheses are defined: Hi_1. University students manifest levels of internet addiction; Hi_2. There is a set of latent variables underlying the explanation of internet addiction and Hi_3. The level of internet addiction differs by gender.

Methodology

The study is of non-experimental design since manipulation of the variables and cross-sectional is not performed because the data collection is carried out in a single moment. The analysis will be exploratory, descriptive and explanatory.

Participants

The participants are university students from the Technological Institute of Sonora in Mexico, who were enrolled in the August-December term of 2019. The selection of the students was non-probabilistic. In total, there were 463 participants where 69 % were men and 31 % women. At the time of the survey application, 47 % were in the first semester, 29 % in the third, 9 % in the fifth and 15 % remaining in other semesters.

Regarding the educational programs, participants from Mechatronics, Civil, Chemistry, Environmental Sciences, Industrial, Software, Electromechanical, Biosystems, Electronics, Manufacturing, Biotechnology, and Bachelor's degrees in Economics and Finance and Public Accounting were surveyed.

Instrument

Young's Internet Addiction Test (I (1998) was used. It consists of 20 items which measure characteristics and behaviors associated with compulsive internet use. The questionnaire includes compulsiveness, evasion and dependency. The questions also evaluate problems caused by the use of the internet with personal, occupational and social functioning. The scale is Likert type with values from 1 (least extreme behavior) to 5 (most extreme behavior) for each question.

In addition, the IAT evaluates the score obtained from Young's (1998) proposal, according to the score obtained, it classifies the level of internet use: A normal level of internet use places it from 0 to 30 points, a slight level of 31 at 49 points, moderate level from 50 to 79, and severe dependency with scores from 80 to 100.

Procedure

To validate the data matrix, Cronbach's alpha index is used to measure internal consistency. For data analysis, in the case of instruments that have been designed with Likert scales – such as Young's IAT Scale (1998) – in addition to testing the hypothesis that the data matrix is an identity

matrix (Ho: R = 1, H1: R ≠ 1) which means that it is not correlated (Ho: R = 0, Hi: R # 0), so the use of Polychoric Correlations matrices is necessary for factor analysis (Richaud, 2005; Ogasawaras, 2011). Exploratory Factor Analysis (AFE) is a method to postulate latent variables that are believed to underlie correlation patterns (Haig, 2013). On the other hand, the Pearson correlations present lower values than the Polychoric correlations.

The model obtained is more consistent with the original measurement model when the Polychoric correlation is used (Holgado-Tello et al., 2008), or at least similar behavior is guaranteed with the Polychoric correlation (Cho et al., 2009).

Other measures that support the relevance of the factorial technique are Bartlett's test of sphericity with KMO, the Chi^2 with n degrees of freedom (df) and the sig. < 0.01, the measures of sample adequacy for each variable (MSA) and factor loads. The decision criterion is: reject H0 if the Chi^2 calculated is greater than the Chi^2 in the tables, otherwise, do not reject. Finally, the analysis of variance (ANOVA) is carried out to test whether there are significant differences between the variables in relation to gender.

Data analysis

The measure of reliability and internal consistency of Young's IAT scale (1998) was $\alpha = .876$ for the 20 indicators, which, according to the theoretical criteria set forth by Hair, Anderson and Tatham (1979), the values of $\alpha > .80$ are acceptable, while George and Mallery (2003) declare $\alpha > .70$ acceptable and $\alpha > .90$ are excellent. Therefore, we can say that the internal consistency of the instrument that measures internet addiction is viable and reliable.

Table 1. Polychoric Correlation matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
V1	1									
V2	0.413	1.000								
V3	0.181	0.255	1.000							
V4	0.176	0.240	0.284	1.000						
V5	0.283	0.374	0.304	0.227	1.000					
V6	0.269	0.451	0.300	0.223	0.399	1.000				
V7	0.224	0.145	0.279	0.194	0.277	0.215	1.000			
V8	0.324	0.473	0.319	0.221	0.383	**0.637**	0.260	1.000		
V9	0.231	0.298	0.417	0.300	0.471	0.441	0.373	0.522	1.000	
V10	0.209	0.312	0.334	0.267	0.314	0.307	0.108	0.381	0.422	1
	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20
V11	1.000									
V12	0.415	1.000								
V13	0.487	0.423	1.000							
V14	0.298	0.325	0.379	1.000						
V15	0.487	0.581	0.589	0.457	1.000					
V16	0.393	0.388	0.395	0.504	0.412	1.000				
V17	0.103	0.105	0.068	0.109	0.185	0.281	1.000			
V18	0.427	0.366	0.338	0.352	0.495	0.385	0.394	1.000		
V19	0.358	0.395	0.422	0.430	0.531	0.376	0.225	0.448	1.000	
V20	0.493	0.596	0.556	0.321	0.629	0.501	0.137	0.486	0.538	1.000

= 0,002,081 Determinant

Polychoric correlations matrix values (Table 1) are acceptable in the 20 variables, showing that it is not an identity matrix, which would indicate no correlation among the study variables. Furthermore, the determinant of .0002 is close to zero, which gives evidence that the Polychoric correlation matrix is acceptable. Likewise, the KMO values of .917 are the Bartlett's test of sphericity, with a Chi^2 value of 3861.4 with df = 190 and ρ <.05 is considered acceptable according to Hair, Anderson & Tatham (1979). Thus, Chi^2 values give evidence to reject H0 according to the criterion that establishes that H0 is rejected if Chi^2 calculated (3861.4 with df = 190) is > Chi^2 from

tables (135,807 *df* = 100 < . 01). This gives statistical evidence that justifies the use of the exploratory factor analysis technique with main component extraction.

The extraction of components under the criterion of eigenvalues > 1 is shown in Table 2 where the eigenvalues, the proportion of the variance, and the proportion of the accumulated variance are shown.

Table 2. Explanation based on eigenvalues

Variable	Eigenvalues	Variance ratio	Cumulative variance ratio
1	7.69829	.38491	.38491
2	1.42928	.07146	.45638
3	1.16115	.05806	.51444
4	1.04324	.05216	.56660
5	.93910	.04695	.61355

Source: own

The values are found in a range of 7.69829 (the highest) and .93910 (the lowest), the fifth factor being slightly less than the suggested criterion > a 1. 61.35 % of the total variance with respect to the Internet addiction is explained by these five factors. In addition, it is observed that the first eigenvalue is very high with respect to the others, so it is suggested to rotate the matrix orthogonally using the Varimax method, in order to identify the most significant loads (> .5) that allows the simplification of each component. The results are shown in Table 3.

Table 3. Explained variance based on eigenvalues

Variable	Eigenvalues	Variance ratio	Cumulative variance ratio
1	6,388	31,940	31,940
2	1,436	7,180	39,120
3	1,183	5,916	45,036
4	1,063	5,313	50,349

Source: own

After orthogonal rotation to the data matrix, we can see that there are now four factors extracted under the criterion of eigenvalue > 1, which accounts for 50.35 % of the cumulative variance; they are those that make up the structure that underlies the explanation of the addiction of students to the internet. Table 4 describes the factors extracted with the factor weights of each of the indicators (loads > to .5).

Table 4. Matrix of components and rotated components

Main components					Matrix of rotated components				
Indicators	1	2	3	4		1	2	3	4
X15	0.713				X15	**0.725**			
X9	0.691				X20	0.685			
X20	0.671				X12	0.681			
X8	0.652				X13	0.63			
X11	0.634				X10	0.623			
X16	0.628				X11	0.613			
X6	0.617				X9	0.552			
X18	0.606				X19	0.548			

X13	0.596				X14			
X12	0.593				X4			
X10	0.593				X2	**0.749**		
X19	0.588				X1	0.678		
X5	0.568				X8	0.579		
X14	0.549				X16	0.555		
X2	0.525				X6	0.546		
X3					X5			
X4					X7		**0.784**	
X1		0.542			X3		0.504	
X7			0.668		X17			**0.803**
X17		0.483		0.610	X18			0.504
Variance by factor of the rotated matrix						31.94 %	7.18 %	5.916 %	5.313 variance
					Total				50.35 %

Extraction method: analysis of main components
Rotation method: Varimax normalization with Kaiser
Source: own

The composition of the components or factors obtained, derived from the Varimax rotation, is as follows:

Component 1 (*X15, X20, X12, X13, X10, X11, X9, X19*). Often the student is concerned when they are offline and fantasizes about being online, leading to feeling depressed, nervous, moody, and these symptoms disappear when they reconnect to the internet. In addition, there is a feeling of fear since they believe that life without the internet is boring, adding the annoyance generated by someone interrupting while they are online.

Other indicators of this factor reveal that students use the internet to relax, when some disturbing thoughts block their mind, which also leads them to anticipate when they will reconnect to the internet. Finally, they often get defensive if someone asks them what they do online, and they prefer to spend time online than to hang out with other people. These indicators explain

Component 2: (*X2, X1, X8, X16, X6*). Spending more time online causes the student to neglect their chores, as they usually spend more time online than they had anticipated. This has caused a deterioration in the performance of their work, seriously affecting their productivity. Often the person points out that a few more minutes when they are online do not make a difference, not knowing that this has already affected their school grades.

Component 3: (*X7, X3*). Often they check their email first, rather than another activity, they even prefer the excitement of being connected to the internet to intimacy with their partner.

Component 4: (*X17, X18*). Frequently the student tries to decrease the time they remain connected to the internet and very often try to hide how long they have been online.

To test the H_1 hypothesis, the level of internet addiction differing by gender, the one-way ANOVA test (F and ρ) is performed, as well as the calculation of the Levene statistic (df1, df2), to test the hypothesis of equality of means and the hypothesis of equality of population variances respectively. Therefore, Table 5 shows the ANOVA and the F statistic with ρ <.05 for each intergroup and intragroup.

Table 5. ANOVA

Variable	Root mean Inter-groups (df=1)	Intra-groups (df=461)	F	Sig.
X1	0.12	1.15	0.10	0.75
X2	0.00	1.27	0.00	0.96
X3	3.43	0.99	3.45	0.06
X4	15.71	1.40	11.25	0.00
X5	2.93	1.36	2.15	0.14
X6	5.29	1.01	5.22	0.02
X7	1.83	1.45	1.27	0.26
X8	0.06	1.10	0.06	0.81
X9	3.35	0.89	3.78	0.05
X10	0.02	1.43	0.02	0.90
X11	6.95	1.33	5.22	0.02
X12	0.41	1.29	0.31	0.58
X13	0.39	0.79	0.49	0.48
X14	2.93	1.52	1.92	0.17
X15	0.25	0.92	0.27	0.60
X16	0.62	1.53	0.41	0.52
X17	2.89	1.46	1.98	0.16
X18	2.47	1.03	2.39	0.12
X19	0.73	1.07	0.68	0.41
X20	0.13	0.71	0.18	0.67

Source: own

Table 5 of the ANOVA describes the root mean values of the intergroups and intragroups with df = 1 and df = 461 respectively, as well as the values of the F statistic with its level of significance, which refers that if ρ <.05 then the hypothesis of equality of means, of I is rejected. On the contrary, if it is greater, the equality of means is accepted, and there is no significant difference between the groups.

The indicators in Table 5: $X4$, $X6$ and $X11$ show high values in the F statistic and their statistical significance is less than 0.05, which leads to the assumption that, if there is a difference in the means by gender in these indicators. This is not the case for the rest of the indicators. In this idea, the variance homogeneity test is now developed to calculate the Levene statistic with gl1 = 1 and gl2 = 461 and the significance (ρ <.5).

Table 6. Variance homogeneity test

Indicators	Levene	df1	df2	Sig.
X1	1,070	1	461	.301
X2	1,489	1	461	.223
X3	7,317	1	461	.007
X4	4,082	1	461	.044
X5	2,909	1	461	.089
X6	.002	1	461	.969
X7	.001	1	461	.977
X8	1,813	1	461	.179
X9	6,574	1	461	.011
X10	.809	1	461	.369

X11	.819	1	461	.366
X12	.959	1	461	.328
X13	.930	1	461	.335
X14	3,023	1	461	.083
X15	.311	1	461	.577
X16	1,561	1	461	.212
X17	.276	1	461	.600
X18	1,903	1	461	.168
X19	.112	1	461	.739
X20	.201	1	461	.654

Source: own

To test the hypothesis of equality of population variances, Levene's statistic is calculated. The criterion establishes that if the critical level (sig.) is ≤ than 0.05, the hypothesis of equality of variances is rejected. Contrariwise, if it is >, the hypothesis of equality of variances is accepted. The values obtained for X3 and X9 (≤ 0.05) suggest that the hypothesis of equality of variances should be rejected, not so in the rest of the indicators, since there seems to be equality of variances. With these data, there is evidence that shows that, in general, there is no difference by gender.

However, the scale developed by Young (1998) also establishes criteria to determine the level of addiction. Therefore, Table 7 classifies the score of each participant in the corresponding addiction level, differentiating the results by gender.

Table 7. Addiction level of university students

Variable Gender	N	Medium	Addiction level							
			Normal (0-30)		Mild (31-49)		Moderate (50-79)		Severe dependency (80-100)	
			#	%	#	%	#	%	#	%
Men	319	42.10	47	14.73	200	62.70	70	21.94	2	0.63
Women	144	40.41	31	21.53	89	61.81	22	15.28	2	1.39
Total	463	41.55	78	16.85	289	62.42	92	19.87	4	0.86

Table 7 shows that the largest percentage of students is located in a mild level (62.42 %), followed by the moderate level (19.87 %), while the lowest percentage gives evidence of severe dependency (.86 %).

3. Results

One of the objectives of the study was to identify the set of latent variables that explain the level of Internet addiction of the students. The research hypothesis indicates that there is a set of variables that explains the level of internet addiction of the students. The results of this empirical study provided relevant information, which allows us to present the findings and propose future lines of research that emerge from this work.

Firstly, the internal consistency and reliability of the instrument was validated, and was found acceptable. Furthermore, considering that the test used is a scale, it was necessary to use the Polychoric Correlations matrices for factor analysis (Richaud, 2005; Ogasawaras, 2011). Once the robustness of the scale was verified, the KMO was revised with a value of .917 and ρ <.000. Bartlett's test of sphericity with Chi^2 of 3861.4 and 190 degrees being superior to the Chi^2 of tables which has a value of 135.807 with ρ < .01 and 100 degrees of freedom. This statistical evidence allowed us to proceed with the exploratory factor analysis technique with component extraction.

The factor structure result reached 50.35 % of the total variance, which is explained by four factors.

The first component groups the items regarding neglecting work with 31.94 % (*X15, X20, X12, X13, X10, X11, X9, X19*), the second component with 7.18 % (*X2, X1, X8, X16, X6*), third component explains 5.92 % (*X7, X3*) and the fourth and last component with 5.31 % (*X17, X18*).

Although the exploratory factor analysis with component extraction formed four factors with 50.35 % of the total variance explained, it seems that it does not coincide with other studies that reported another structure. A case that we can compare, with the findings of Alavi, Eslami, Maracy, Najafi, Jannatifard and Rezapour (2010) who identified five factors called social problems, performance effects, lack of control, pathological use of chats and negligence in the education and occupational duties. Similar the result reported in the study by Guan, Isa, Hashim, Pillai and Singh (2012) who also reported a five-factor structure.

However, there are investigations that have found different factor structures. For example, a model with a single factor and good psychometric properties was found in the studies of Khazaal, Billieux, Thorens, Khan, Louati, Scarlatti, Theintz, Lederrey, Van Der Linden and Zullino, (2008), Pontes, Patrao and Griffiths (2014), Dhir, Chen, Nieminen (2015), Panayides and Walker (2012), Waqas, Farooq, Raza, Javed, Khan, Ghumman, Naveed, Haddad (2018).

In turn, a two-factor structure was established in the study by Barke, Nyenhuis and Kroner-Herwig (2012). In turn, Jelenchick, Becker and Moreno (2012) determined two factors, which they classified as dependency and excessive use. Also, Fernández-Villa, Molina, García-Martín, Llorca, Delgado-Rodríguez and Martín (2015) obtained two factors interpreted as emotional investment and time and performance management.

A three-dimensional structure was also reported, which was identified by Chang and Law (2008), classified as withdrawal and social problems, time management and performance, and substitute for reality. In turn, Tsimtsiou, Haidich, Kokkali, Dardavesis, Young and Arvanitidou (2013) obtained three factors, which they interpreted as emotional psychological conflicts, time management, and carelessness at work. On the other hand, Lai, Mak, Cheng, Watanabe, Nomachi, Bahar, Young, Ko, Kim and Griffiths (2015) found three factors called withdrawal and social problems, time management and performance, and a substitute for reality.

On the same idea, Mohammadsalehi, Mohammadbeigi, Jadidi, Anbari, Ghaderi and Akbari (2015) established a three-factor structure classified as disorder of personal activities, emotional and emotional disorder, and disorder of social activities. The factors described in the study by Neelapaijit, Pinyopornpanish, Simcharoen, Kuntawong, Wongpakaran and Wongpakaran (2018) were functional impairment, withdrawal symptoms, and loss of control.

Regarding the results of this empirical study where we report four factors, it seems to coincide with the structure that Kaya, Denle and Young (2016) who found a model with four factors, called mood, relationship, responsibilities and duration. Also in Lee's study, Lee, Gyeong, Yu, Song and Kim (2013) extracted four factors (overuse, dependency, retraction, and escape from reality). On the other hand, Samaha, Fawaz, Yahfoufi, Gebbawi, Abdallah, Baydoun, Ghaddar and Eid (2018) obtained a model of four named factors: lack of control, social withdrawal and emotional conflict, time management problems and behavior concealment problematic. In the work of Ndasauka, Pitafi and Kayange (2019) the four factors were identified as salience, conflict, tolerance and mood modification.

Another study that reports a different factor structure is that of Widyanto, McMurran (2004) who obtained six factors, which they called: prominent feature, excessive use, neglect of work, anticipation, lack of control and neglect of social life.

The diversity of factor structures obtained in the different studies is an indication of the complexity of the construct, hence the importance of expanding this type of study in different populations.

Another objective of the study focused on identifying the level of internet addiction among university students. The results indicated that although it is a very small percentage that is located in the category with severe dependence, these data are very important, since they allows identifying the problem and with it, a strategy or course of action can be designed to solve it. However, the highest percentage of students with addiction traits is concentrated between the mild level (62.42 %) and the moderate level (19.87). Although these figures do not represent alarming data, it would be advisable to pay attention so that they are not increased to a severe level of addiction.

Remember that this behavioral addiction causes physical, personal and social well-being disorders (IRMA, 2019; Rokkum et al., 2018, Lopez-Fernandez, 2019; Khan, 2018). Therefore, it is opportune to generate strategies that support students so that they can use the internet without falling into a severe dependency that interferes with their daily life (Kuss, Pontes, 2018; Wallace, 2014), caused by the ease of connection to internet and the availability of digital devices (García, 2013).

In addition, the use of the internet at work or to carry out school activities considered necessary can hide the addiction (Young, 1998). Also, the immediate gratification that ICTs provide stimulates internet addiction according to Reinarman, and Granfield (2015). Faced with addictive behaviors Hammersley (2018) refers that the circumstances that caused the addiction must be changed, although it is also necessary for it to be identified as an addiction, it is because an abusive use of the resource has been detected according to García (2013).

In this study, the participants showed levels of addiction that are not worrisome according to Young's classification (1998), since the percentages that concentrate the largest number of students surveyed are in the range of mild and moderate addiction. This gives the opportunity to establish a program that prevents severe addiction in the university community with all the disorders that such behavior entails.

Regarding the objective to determine if there are gender differences in levels of internet addiction, it was found that for this university community, there are no significant differences by gender between levels of addiction. This coincides with the studies by Dai (2016), Dufour, Brunelle, Tremblay, Leclerc, Cousineau, Khazaal, Légaré, Rousseau and Berbiche (2016) and Khan, Shabbir, and Rajput (2017). In contrast, gender differences have been found in the works of Fernández-Villa, Alguacil-Ojeda, Almaraz-Gómez, Cancela-Carral, Delgado-Rodríguez, García-Martín, Jiménez-Mejías, Llorca, Molina, Ortíz-Moncada, Valero-Juan and Martín (2015), Goswami and Singh (2017), Babalola, Ekundayo, Kemmer and Ayenibiowo (2017), Kaur (2018) and Singh (2019).

4. Conclusion

Finally, we can say that Young's (1998) internet addiction scale presents high reliability and internal consistency, making it a valid test to identify the presence of internet addiction in the populations studied. On the other hand, the diversity between the dimensions obtained in multiple studies indicates that the results differ both in the number of factors and in their identification, which reveals the complexity of the construct and the diversity of statistical techniques for the interpretation of the data.

Few studies on the subject have been identified in Latin America, so it is considered important to delve into other investigations that lead us to identify similarities and contrasts between the populations of the same region or country. This, in turn, will allow establishing actions on the factors that are influencing to generate internet addiction in each population.

Finally, we can point out that, because the participants were university students, this can be beneficial, since the institution where these young people study has the power to generate strategies aimed at preventing internet addiction. As an example of this, General training courses can include activities to develop a culture of proper use of the internet, taking advantage of the resource without making excessive use of it. Implementing strategies to prevent addiction, as well as programs to recover from an internet addiction, in themselves are projects that can be developed by the students themselves with the guidance of professionals on the subject.

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