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*Artículos científicos*

## **Construcciones de género y factores subyacentes al uso adictivo al Internet en universitarios de Nuevo León, México**

***Gender Constructions and Factors Underlying Addictive Internet Use Among University Students in Nuevo León, México***

***Construções de gênero e fatores subjacentes ao uso viciante da Internet em universitários de Nuevo León, México***

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### **Resumen**

Los estudios empíricos del uso adictivo al Internet en México han sido examinados bajo dos enfoques de análisis: 1) a partir de incluir variables explicativas para entender su origen y 2) mediante la identificación de principales factores vinculantes. La línea de investigación de este trabajo pertenece a este último. El objetivo fue mostrar si hay diferencias por género entre los factores vinculantes del uso adictivo al Internet en universitarios mexicanos. Se aplicó el cuestionario de Test de Adicción al Internet (TAI), versión adaptada al español del test de Young, y sus resultados se discutieron según el género. Se revelaron grados y comportamientos específicos y diferenciales. Se empleó un análisis factorial, con pruebas robustas de fiabilidad, y cuyos resultados proporcionaron elementos para reflexionar y concluir que hay diferencias significativas en el nivel de adicción al Internet y que el género influye en el tipo de dependencia.

**Palabras clave:** adicción al Internet, dependencia, género, TIC, universitarios.

## Abstract

Empirical studies of addictive Internet use in Mexico have been examined under two analytical approaches: 1) by including explanatory variables to understand its origin and 2) by identifying the main binding factors. The research line of this paper belongs to the latter. The objective was to show whether there are differences by gender among the binding factors of addictive use of the Internet in Mexican university students. The Test de Addiction al Internet (TAI) questionnaire, a Spanish adapted version of Young's test, was applied and its results were discussed according to gender. Specific and differential degrees and behaviors were revealed. A factorial analysis was used, with robust reliability tests, and its results provided elements to reflect and conclude that there are significant differences in the level of Internet addiction and that gender influences the type of dependence.

**Keywords:** internet addiction, dependency, gender, ICT, university students.

## Resumo

Os estudos empíricos do uso viciante da Internet no México foram examinados sob duas abordagens de análise: 1) incluindo variáveis explicativas para entender sua origem e 2) identificando os principais fatores vinculantes. A linha de investigação deste trabalho pertence a este último. O objetivo foi mostrar se existem diferenças de gênero entre os fatores vinculantes do uso viciante da Internet em estudantes universitários mexicanos. Aplicou-se o questionário Internet Addiction Test (TAI), uma versão em espanhol do teste de Young, e seus resultados foram discutidos de acordo com o gênero. Graus e comportamentos específicos e diferenciais foram revelados. Foi utilizada uma análise fatorial, com testes robustos de fiabilidade, cujos resultados forneceram elementos para refletir e concluir que existem diferenças significativas no nível de dependência da Internet e que o gênero influencia o tipo de dependência.

**Palavras-chave:** vício em internet, dependência, gênero, TIC, estudantes universitários.

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## Introduction

This study explores the use of time dedicated to the Internet and the degree of dependency according to gender in young university students from an urban center in northern Mexico. The Spanish version of the Internet Addiction Test (IAT) was digitally applied, a robust capture instrument with 20 Likert-type scale items that, as its name indicates, was initially prepared in English; Thus, the Young Internet Addiction Test (TAI) validated by Puerta and Carbonell (2013) and Hilt, Bouvet de Korniejczuk and Collins (2015) is applied here. It should be noted that the IAT, in recent studies (Lu, Yeo, Guo, Zhao & Wu, 2022), has been modified, tested, and validated in a sample of students from Asian countries with benefits in its efficiency. In Mexico, studies with this instrument have been extended to young people and demographic profiles of health personnel (Flores et al., 2022), without considering the gender approach as the main line of research.

In the early 2000s, the labor and social repercussions associated with abuse and dependence on the Internet began to be studied. The alarm signals were the indifference towards socialization and direct communication, as well as the emotional instability caused in the students of upper grades (Young, 2005). According to Hernández (2019), the term problematic use of the Internet refers to the inability of the individual to control its use, which causes psychological discomfort and functional impairment (p. 184).

According to Puerta and Carbonell (2013), in Mexico the levels of dependence on the Internet in young students are relatively low compared to their peers in other Latin American countries, while the gender condition shows that the scores of the Young's test in the population men are greater than those of women.

In current times, exposure to the Internet as a means of socialization, education, and work has intensified because of the 2019 coronavirus disease (covid-19) health crisis. If studies prior to this health contingency had already detected levels of high exposure to the Internet in the lives of young university students and adolescents, as well as some of its consequences, now that changes have been implemented in the way we relate to each other, this situation has been exacerbated. It is not only a means of socialization and the most important tool for educational activities, but also for certain work environments; however, its excessive use is associated with a greater burden of mental and physical symptoms. (Flores et al., 2022).

The pandemic has intensified the use of digital tools, a situation that could have a differentiated effect on the degree of dependency and type of addictive behavior. This last aspect brings to the surface how binding factors are associated according to gender. In other words, based on the responses to the test provided by female and male university students, addictive behavior can be identified in one gender or another and how the binding factors are associated.

The objective of this work is to analyze the degree of dependency and the factors associated with the use of the Internet in university students from Nuevo León. The guiding hypothesis of this research establishes that there would be gender differences in the degree of dependency and factors involved because of gender mandates that condition knowledge of information and communication technologies (ICT). The question to be answered is: are there gender differences in the degree of dependence on the Internet in young university students from New Leon? How are these differences in the set of factors associated with the test? In summary, the question is whether there are significant differences in the degree of dependency and the way in which IAT factors are grouped between young male and female university students from New Leon.

The background of the test, along with its conceptualization, dates to 1996, when Kimberly Young stated that dependence on the Internet can become an addiction. The addiction had always been related to substances of chemical origin and consequently the use of the Internet was not likely to be categorized as such. Furthermore, at that time, it was seen as a tool that provided society with only benefits and not setbacks or negativities associated with addiction. Years later, this author classified it as an impulse control disorder, an addiction similar to gambling (Young, 2005, p. 265). Pulido, Escoto, and Gutiérrez (2011) and Orozco (2021) introduced terminology such as excessive use of the Internet, addiction or problem behavior, behavioral addiction, or addiction not associated with substances. However, to date, there is still no consensus on the criteria for classifying it, either as a disorder or as an addiction. The World Health Organization (WHO) has approved revision number 11 of the International Statistical Classification of Diseases and Related Health Problems (ICD) to video game use disorder, which, from said revision, came to be considered officially an addictive behavior disorder since January 1, 2022 (Consejo Ejecutivo, 2018).

The university population with bad study habits is more prone to developing an addiction (Young, 2010). The repercussions range from building an identity that is different from the real one in image traits, intelligence, and social skills, to changes at another level

such as academic dropout, depression, and the decrease and replacement of social relationships, as well as access to prohibitive activities (Scherer, 1997); Morhan-Martin, 1997, both cited in Young, 2005). The subject is currently being discussed due to the intensity with which the Internet is used as an educational tool, and the reason is that there is disagreement among educators about its effect on performance (Barber, 1997, cited in Young, 1998).

On the one hand, there are studies on addictive behaviors. In this regard, Block (2008, cited in Hilt et al., 2015) refers to three categories: excessive games, sexual concerns, and messaging (texts, emails and chat), to which Young (2004, p. 667) adds one more, information overload. On the other, how university men and women are inclined and choose their hobbies and dependencies according to the content available on the Internet. According to some studies, gender is a differential factor that goes beyond the hobby to the subtypes of Internet hobbies; for example, it has been identified that the male population tends to depend more on video games (Babalola, Ekundayo, Kemmer & Ayenibiwo, 2017; Fernández et al., 2015; Gill, 2019; Goswami & Singh, 2017; Kaur, 2018; Lam, Peng, Mai and Jing, 2009; Ruiz, Lucena, Pino and Herruzo, 2010). However, other studies affirm that there are no gender differences in the levels of Internet addiction (Dai, 2016; Dufour et al., 2016; Khan, Shabbir and Rajput, 2017).

Addictive behaviors in the selection of content are usually the product of training mediated and influenced by a social environment. In this sense, research (Mancilla, Barros and Mora, 2019; Orozco, 2021) on the formation of gender roles and their link with digital tools have found that the construction of cultural patterns from an early age determines the link between ICT and the gender of the person. They also conclude that there is a non-biological factor that influences the unequal digital gap, this can have an impact as a factor of exposure to technological tools and consequently its dependency and type.

Stereotypes in the male population are associated with hard, technical, and mathematical skills, and those of the female population, on the other hand, are associated with less technical and more communication and soft skills (Mancilla, Barros, & Mora, 2019). However, in another study the same acceptance of computer games and programs was identified during the first years of childhood: regardless of gender, they tend to choose the same; but, as the years go by, in primary school, their interests begin to be determined by gender issues (Romero, 2018 cited in Mancilla et al., 2019). Interests built as students in subsequent years are often the result of a cultural pattern. Taking the above into account, with

the current digital exposure scenario, there are elements to decide which gender is more prone to degree of dependency, as well as what kind of hobbies they can lean towards.

According to the Orozco (2021) study, in Mexico the degree of dependency shows significant differences in the levels according to gender, but not by factors. By level, men have high percentages of addiction in a severe and moderate degree, while those of women are in a mild degree. In another investigation, applying the TAI, Hilt et al. (2015) found that 43% make little use of the Internet, 52% are average users, with only 4.88% problems and 0.79% with significant problems, although they point out that the university of the participants has a religious orientation and that could influence the result. Be that as it may, its results are not approached with a gender perspective. Of course, it has been found that the values with serious risk of Internet addiction are comparatively lower than in some studies carried out in Asian countries (Lam *et al.*, 2009).

In this part of the study, we address the question of binding factors in the research carried out from the TAI for Mexican students. Groups of three to five factors were identified that explain between 49% and 60% of the total variance (see table 1). In factors according to gender, and despite not having found significant differences in this study, the conclusions are not definitive. The interpretation of the factors depends to a large extent on the conformation they take when grouped, according to the items, the relevant trait for each factor is labeled and gender is not analyzed in any of them, except for what happens in the work of Orozco (2021).

**Table 1.** Studies carried out in Mexico on the problematic use of the Internet and its factors based on the Young's test

Author	Population and type of test	Objective and method	Factor dimension
Pulido <i>et al.</i> (2011)	697, Mexico City. Test Beck criteria DSM IV (American Psychiatric Association [APA], 2000) and skills scale and Young	Behavioral prevalence.	5 Factors: substitution (19, 15, 18, 17 y 10), loss of control (2,1 y 5), anticipation (questions 6, 7, 14 y 9), recognition of lack of control (3,8 y 4) and evasion (13, 12 y 11).
Hilt <i>et al.</i> (2015)	881, Nuevo León, 20 reactive Young's test	Diagnosis of Internet use. Tests Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity. F actor analysis based on varimax rotation.	Three factors: time management problems (seven items) (38.8 %), Psychological-emotional conflicts (nine items) (7.3 %) and prominence (four items) 6.04 %.
Navarro, García y Molchanova (2020)	463, Sonora, 20 reactive Young's test	Degree of Internet addiction and latent variables associated with gender. Removal of major components, varimax rotation with Kaiser.	Four factors: items 15, 20, 12, 13, 10, 11, 9, 19; items 2, 1, 8, 16, 69; items 7 and 3; items 17 and 18.
Mendoza Baena y Baena (2015)	112, State of Mexico, Young's test modified to 30 reactive	School performance and Internet use. Principal component analysis (ACP), Bartlett sphericity test, Kaiser-	Four factors: performance (52.2%), anxiety (8.3%), use and intensity (5.4%), age and grade level (4.5%).

		Meyer-Olkin sample adequacy measure.	
Orozco (2021)	370, Mexico City and State of Mexico, Young's test	Gender differences: men without addiction (16.9%), mild (14.7%), moderate (53.5%) and severe (14.7%); women without addiction (17.3%), mild (19.7%) moderate (50.9%) and severe (11.0%).	Six symptoms without finding significant differences by gender. He calls them <i>saliencia, loss of control, social neglect, neglect of work, overuse</i> , and <i>anticipation</i> . No information about grouping by symptom by item.

Source: self made

Navarro *et al.* (2020) refer that the diversity of factorial 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 and the diversity of statistical techniques for data interpretation. Table 2 is a summary of the review carried out internationally in this study.



**Table 2.** Studies and dimensions of factors at the international level of the Young'n test cited by Navarro *et al.* (2020)

Number of factors	Authors
1	Khazaal <i>et al.</i> (2008), Pontes, Patrao and Griffiths (2014), Dhir, Chen and Nieminen (2015), Panayides and Walker (2012), Waqas <i>et al.</i> (2018).
2	Barke, Nyenhuis y Kroner-Herwig (2012), Jelenchick, Becker and Moreno (2012) (dependencia y uso excesivo), Fernández <i>et al.</i> (2015).
3	Chang y Law (2008) (retraimiento y problemas sociales, gestión del tiempo y desempeño y sustituto de la realidad), Tsimtsiou <i>et al.</i> (2013) (conflictos psicológicos emocionales, gestión del tiempo y descuido en el trabajo), Mak <i>et al.</i> (2015) (abstinencia y problemas sociales, gestión del tiempo y desempeño y un sustituto de la realidad), Mohammadsalehi <i>et al.</i> (2015) (trastorno de las actividades personales, trastorno emocional y trastorno de las actividades sociales), Neelapajit <i>et al.</i> (2018) (deterioro funcional, síntomas de abstinencia y pérdida de control).
4	Kaya, Denle, and Young (2016) (mood, relationship, responsibilities, and duration), Lee, Lee, Gyeong, Yu, Song, and Kim (2013) (overuse, dependence, withdrawal, and escape from reality), Samaha <i>et al.</i> (2018) (lack of control, social isolation emotional conflict, time management problems and behavior concealment problems), Ndasauka, Pitafi and Kayange (2019) (prominence, conflict, tolerance and mood modification), Chung (2019) (entertainment, anonymity and interpersonal relationships).
5	Alavi <i>et al.</i> (2010) (social problems, performance effects, lack of control, pathological use of chat and neglect in education and occupational duties), Guan <i>et al.</i> (2012).
6	Widyanto and McMurrin (2004) (prominent feature, overuse, neglect of work, anticipation, lack of control and neglect of social life).

Source: Own elaboration based on Navarro *et al.* (2020)

Latin American studies such as that of Puerta and Carbonell (2013) find six factors. Aboujaoude (2010) and Matalinares, Ornella and Baca (2014) identify four factors in the Internet addiction test: 1) excessive use (translated into loss of sense of time) (questions 9 to

20, except 11), 2) the tolerance (the need for better and more efficient equipment, as a compensation to alleviate the anxiety of not being connected) (questions 3, 4, 5 and 11), 3) withdrawal or withdrawal (feeling of anxiety or anger at the lack Internet access) (questions two and eight) and 4) consequences (poor performance, neglect at home, isolation or fatigue) (questions six and seven). These factors are compatible with the criteria determined by the APA for impulsive compulsive Internet use disorder, and all its variants (excessive gaming, sexual preoccupation, and messaging) share the following four components: excessive use, withdrawal, tolerance, and consequence negative (Matalinares *et al.*, 2014).

## Methods and materials

This research is quantitative. The geographical delimitation of the study in which we applied the TAI was the state of Nuevo León, Mexico. According to the 2020 Population and Housing Census (National Institute of Statistics and Geography [Inegi], 2020), 69.5% of Nuevo Leon homes had Internet in 2020, while the national average is 52.2%; Regarding access to a computer, 48.0% of the households had at least one in their home, while on a national scale only 37.7%; Finally, 18.5% of the homes in Nuevo León had a video game console, while at the national level only 11.5%. At the municipal level the numbers improve, for example, in the municipality of Monterrey, there is 77.7% availability to the Internet, 57.7% with a computer and 21.5% with a video game console. So, these data lead us to consider that the study is carried out in an area with high possibilities of Internet accessibility (Inegi, 2020).

The sample is made up of 823 young students from the Autonomous University of Nuevo León selected for convenience. The survey period began in April and ended in July 2021; It was virtually due to the social distancing measures imposed to prevent covid-19. Of the total number of students, 342 (41.6%) were men and 481 (58.4%) women. The students were studying the following majors: Public Accountant ( $n = 238$ , 28.9%), Administration ( $n = 323$ , 39.2%), Information Technology ( $n = 118$ , 14.3%), International Business ( $n = 129$ , 15.7%), others ( $n = 15$ , 1.8 %).

The questionnaire is a Spanish version of Kimberley Young's IAT to measure Internet use in Anglo-Saxon university students. The Internet addiction test is made up of 20 items measured on a Likert scale. The scores were distributed as follows: 1 = Rarely, 2 = Occasionally, 3 = Frequently, 4 = Often, 5 = Always, and 0 = Never. To define the degree of

Internet addiction, four groups were created based on the total score: 0-30, normal range; from 31-49, slight; 50-79, moderate and 80-100, severe.

For its validation, the following phases were followed: a) insertion of the test into a portal for its application; b) cleaning of the database and selection of reagents; b) exploratory factorial analysis, after calculating the KMO measure of sample adequacy and Bartlett's test of sphericity; c) successive reduction of items until adequate factorization, adopting for the elimination of the items the little effect of the load of the item on the factor or its location in two factors; d) confirmatory factor analysis (CFA) to test the structure of the factor model obtained; e) elaboration of an AFC for the definitive contrasting of the model and the application of different indices of adaptation for contracting the adequacy of the model; f) preparation of a second-order AFC for the definitive contrasting of the model and the application of different adjustment indices for contracting the adequacy of the model; g) finally, for the reliability and internal consistency of the scale, Cronbach's alpha and composite reliability were calculated using the Jöreskog ro. Statistical analyzes were carried out using the statistical packages SPSS v. 22.

The analysis method used is factorial and exploratory, which makes it possible to postulate latent variables that are believed to underlie the correlation patterns (Haig, 2013). Reliability and consistency are evaluated with Cronbach's alpha and dimensions with Bartlett's test of sphericity. The above studies use the PCA rotation varimax retention of values technique and the validity measure of adequacy of the KMO sample (Matalinares et al., 2014; Navarro et al. 2020; Pulido et al., 2011).

The internal consistency of the TAI, measured by Cronbach's alpha, was 0.919. which suggests a consolidated result, similar to Orozco (2021), which was 0.913. For differences in gender and level of addiction, the data were analyzed with Student's t tests and Bonferroni post hoc Anova with a significance level  $< 0.05$ .

## Results

According to the TAI results, the student sample had a mean of 50.2 in a range of 0 to 100 and a standard deviation of 16.7. Regarding the degree of Internet addiction, 9.2% of the students presented a normal degree, 46.0% mild, 38.7% moderate and 6.1% were classified as users at serious risk of Internet addiction, in a severe degree. Regarding the differences between the degrees of addiction, they are all highly significant ( $p < 0.05$ )

according to the Bonferroni post hoc test, in contrast to the study by Orozco (2021) and Hilt et al. (2015).

**Table 4.** Mean and standard deviation of age and TAI score according to degree of addiction

Category	Normal <i>n</i> = 70 <i>x</i> /DE	Minor <i>n</i> = 352 <i>x</i> /DE	Moderate <i>n</i> = 296 <i>x</i> /DE	Severe <i>n</i> = 470 <i>x</i> /DE	F	P	Dif
Age	22.5/3.9	22.0/2.4	21.9/2.3	22.2/1.6	1.189	0.313	
Scoring TAI	26.7/3.1	40.2/5.3	61.5/7.9	88.9/7.2	1458. 5	0.000	1 vs. 2, 3, 4; 2 vs. 1, 3, 4; 3 vs. 1, 2, 4; 4 vs. 1, 2, 3

Source: Own elaboration based on Orozco (2021)

The results of table 5 show the percentages of addiction level by sex: in men, 10.0% are at the normal level, 40.1% mild, 41.7% moderate and 8.0% severe. On the other hand, 8.4% of women show a normal level, 50.1% mild, 36.6% moderate and 4.9% severe. Significant differences were found between men and women at all levels of addiction.

**Table 5.** Degree of addiction to the Internet according to the TAI according to gender

Degree of addiction	Women (%) <i>n</i> = 309	Men (%) <i>n</i> = 445	F/ <i>p</i>
Normal	8.4	10.2	1139.3/0.000
Minor	50.1	40.1	956.8/0.000
Moderate	36.6	41.7	1302.9/0.000
Severe	4.9	8.0	756.0/0.001

Source: Own elaboration based on Orozco (2021)

Regarding the specific uses made by young university students, significant differences are observed. Table 6 shows the results of the contrast of means that were

significant ( $p < 0.000$ ) according to the Student's  $t$  test in 13 of the 20 items in favor of the male population, that is, they present excessive use (see items 1, 14, 15 and 18, which are related to time management), which yields significant gender differences ( $p < 0.000$ ) according to Student's  $t$  test. The same relationship can be seen for items 6, 8, 20 and 13, related to productivity and withdrawal symptoms, as well as items 11 and 12, linked to thoughts of withdrawal and escape from reality; in items 4 and 19, which refer to practical interpersonal relationships that occur with greater intensity in men, and finally, in the case of item three, related to cybersex.

**Table 6.** Contrast of means according to gender for each item of the TAI

Description	Gender	Mean	Standard desviation	N	$t$	Sig. (bi)
1. How often do you find that you have been sailing longer than you intended to be?	Male	4.27	0.998	331	-2.861	.004
	Woman	4.45	0.851	472		
	Total	4.38	0.918	803		
2. Do you neglect your household chores to spend more time in front of the computer browsing?	Male	3.21	1.304	332	.968	.333
	Woman	3.12	1.340	471		
	Total	3.16	1.325	803		
3. Do you prefer to get aroused by photos or videos over the internet instead of seeking intimacy with your partner?	Male	1.96	1.323	329	6.426	.000
	Woman	1.43	1.016	468		
	Total	1.65	1.182	797		
4. How often do you establish friendly relationships with people youknow online?	Male	2.89	1.394	331	4.739	.000
	Woman	2.42	1.375	472		
	Total	2.61	1.401	803		
5. How often do people around you reproach you for	Male	2.57	1.345	331	.469	.639
	Woman	2.53	1.406	472		
	Total	2.55	1.381	803		

spending too much time on the Internet?						
6. Is your academic activity (school, university) harmed because you spend too much time browsing?	Male	2.21	1.317	332	1.967	.050
	Woman	2.04	1.223	472		
	Total	2.11	1.265	804		
7. How often do you check email before performing other priority tasks?	Male	3.23	1.320	332	-.321	.748
	Woman	3.26	1.315	469		
	Total	3.25	1.316	801		
8. Is your productivity at work harmed by Internet use?	Male	2.15	1.360	329	1.831	.067
	Woman	1.98	1.257	470		
	Total	2.05	1.302	799		
9. Do you become cautious or reserved when someone asks you what you spend your time browsing on?	Male	2.56	1.368	331	2.078	.038
	Woman	2.36	1.432	470		
	Total	2.44	1.409	801		
10. Do you escape from your real-life problems by spending time connected to the Internet?	Male	2.81	1.523	331	1.100	.272
	Woman	2.69	1.512	471		
	Total	2.74	1.517	802		
11. Do you ever find yourself thinking about what you're going to do the next time you go online?	Male	2.59	1.479	331	4.205	.000
	Woman	2.17	1.340	472		
	Total	2.34	1.414	803		
12. Are you afraid that your life without the Internet will be boring and empty?	Male	2.61	1.550	331	2.603	.009
	Woman	2.33	1.423	472		
	Total	2.45	1.482	803		
13. Do you feel annoyed when someone interrupts you while you are browsing?	Male	2.17	1.420	332	3.145	.002
	Woman	1.88	1.172	470		
	Total	2.00	1.288	802		
	Male	3.10	1.410	331	1.896	.058

14. ¿Con qué frecuencia pierde horas de sueño pasándolas conectado a Internet?	Woman	2.92	1.318	472		
	Total	2.99	1.359	803		
15. ¿Se encuentra a menudo pensando en cosas relacionadas con Internet cuando no está conectado?	Male	2.52	1.385	331	2.810	0.005
	Woman	2.25	1.341	472		
	Total	2.36	1.365	803		
16. Has it ever happened to you to say "just a few more minutes" before turning off the computer?	Male	3.03	1.538	332	0.249	0.803
	Woman	3.00	1.503	472		
	Total	3.01	1.517	804		
17. ¿Ha intentado alguna vez pasar menos tiempo conectado a Internet y no lo ha logrado?	Male	2.77	1.438	332	0.419	0.675
	Woman	2.73	1.418	471		
	Total	2.75	1.426	803		
18. Are you trying to hide how much time you spend browsing?	Male	2.12	1.386	329	2.585	0.010
	Woman	1.88	1.257	470		
	Total	1.98	1.316	799		
19. Prefer to spend more <i>time online</i> than with your friends in real life?	Male	2.00	1.292	330	2.932	0.003
	Woman	1.74	1.179	471		
	Total	1.85	1.232	801		
20. Do you feel anxious, nervous, depressed, or bored when you're not connected to the Internet?	Male	2.09	1.353	331	2.817	0.005
	Woman	1.84	1.156	471		
	Total	1.95	1.247	802		

Note:  $p < 0.05$

Source: self made

The KMO sampling adequacy measure (0.951) and Bartlett's sphericity test ( $\chi^2(190) = 6561.708, p < 0.000$ ) show that the correlation matrix is not an identity matrix. Therefore, the TAI was suitable for carrying out a factorial analysis, in such a way that it was decided to apply the technique of principal components and varimax rotation. Three factors were

extracted (see table 7), in a similar way to Mohammadsalehi et al. (2015) and Neelapajjit et al. (2018). The dimensions found in the factorial analysis explain 53.65% of the variance. By comparison, the result of Hilt et al. (2015) explains 52.09 % of the accumulated variance with the three factors, that is, a little less than this study.

The research presented here indicates that factor 1 explains 31.32% of the variance and is related to withdrawal or withdrawal problems. Factor 2 explains 7.4% of the variance and has to do with low performance or neglect of work. Factor 3 explains 10.9% of the variance and is related to excessive use or lack of control, that is, with time management problems, which shows differences in the explained variance and in the grouping of the items that make up each one. of the factors found in other studies (Hilt et al., 2015; Mendoza et al., 2015; Navarro et al., 2020; Orozco, 2021; Pulido et al., 2011), however, our results coincide with those of Hilt et al. (2015) in which the first factor is related to psycho-emotional conflicts that have to do with withdrawal or withdrawal problems.

**Table 7.** Result of grouping of factors in Neolonese university students

Factor	Number of items	Value Eigen	Variance (%)	Cumulative variance (%)
1	11	8.196	31.328	31.328
2	4	1.36	11.418	42.746
3	5	1.175	10.908	53.654

Source: Own elaboration based on Hilt *et al.* (2015)

The factorial structure of the TAI found for the sample of Neo-Leonese university students of this research is shown in Table 8, right there the factors are indicated with their corresponding items and the saturations or loads of these, which, since they are in almost all the cases of 0.40 or more, favor the clear definition and interpretation of the factors, according to Comrey (1985, cited in Aliaga et al., 2006)

Factor 1 is made up of 11 items, called Self-regulation, and is related to withdrawal or withdrawal problems due to Internet addiction, which includes feelings of anger, tension, or depression when the computer is inaccessible. Factor 2 is made up of four items, named Productivity, linked to problems of low performance or neglect of work, which can cause social isolation and fatigue. Factor 3 is made up of four items, called Availability of time, and is related to excessive use or lack of control while browsing the Internet, that is, with a



loss of sense of time or neglect of basic needs such as eating, sleeping or sanitize. Regarding gender, there is no difference in the conformation of the factors, except for item 16, which is part of factor 2 for women and factor 3 for men.

**Table 8.** Matrix of total rotated component according to gender

Items	Total			Women			Men			Differen ces. M-H
	Factors									
	1	2	3	1	2	3	1	2	3	
1			0.775			0.728			0.775	-0.047
2			0.577			0.526			0.577	-0.051
3	0.567			0.583			0.567			0.016
4	0.425			0.509			0.425			0.084
5			0.423			0.456			0.423	0.033
6		0.491			0.498			0.491		0.007
7		0.655			0.53			0.66		-0.121
8		0.593			0.66			0.59		0.071
9		0.644			0.71			0.64		0.064
10	0.526			0.445			0.526			-0.081
11	0.638			0.598			0.638			-0.040
12	0.696			0.657			0.696			-0.039
13	0.760			0.756			0.760			-0.004
14			0.538			0.555			0.538	0.017
15	0.736			0.709			0.736			-0.027
16			0.522			0.561	0.583			-0.022
17	0.600			0.545			0.600			-0.055
18	0.735			0.71			0.735			-0.025
19	0.733			0.682			0.733			-0.051
20	0.771			0.751			0.771			-0.020

Note: The description of the item corresponds to the same as in table 6. Extraction method: ACP. Rotation method: varimax with Kaiser normalization. The rotation has converged to eight iterations.

Source: self made

When correlating the factors and gender (table 9), the results show a significant and inverse association between factor 1 (Self-regulation) and gender, which indicates that men have less self-regulation in Internet use compared to women. women.

**Table 9.** Correlation of TAI factors and gender

Factors TAI	Gender	
	<i>R</i>	<i>p</i>
Factor 1	-.146**	0.000
Factor 2	-.027	.461
Factor 3	.108**	.003

*r* = Pearson correlation; *p* = Significance.

Source: self made

## Discussion

A higher average level of severe severity is observed in young university students from New Leon compared to the results of Orozco (2021) for Mexico City. This could be due to contextual aspects between the two entities, such as greater access to the TIC. In the degree of severe Internet addiction, the results were different from those reported by Hilt et al. (2015) (0.79% vs. 6.1%), this could be a possible effect of the covid-19 pandemic, since this study was carried out during the confinement of the students in their homes due to the social distancing measures applied. At the beginning of 2020, with the health crisis caused by the type 2 coronavirus infection that causes severe acute respiratory syndrome (SARS-CoV-2), some emergency teaching practices were adopted in public and private schools of all levels. educational in Nuevo León. Social distancing was established as a priority norm and the Internet was an essential tool to achieve distance education. It was forced to expand the activity on the Net and this could have generated an increase in the degree of addiction to the Internet, severe in New Leonese university students.

According to gender, people classified as users at serious risk of Internet addiction represent 8% of the male population and 4.9% of the female population, this data is contrary to studies that indicate that there is no difference by gender at the level of Internet addiction, such as Dai (2016), Dufour et al. (2016) and Khan et al. (2017); although it coincides with what was found by Orozco (2021) in that it is men who have a greater addiction to the

Internet, even when women during the pandemic had to make greater use of the Internet as a means of learning and to communicate with family and friends . Men present higher percentages of addiction in severe and moderate, and women in mild, these results are similar to those also found by Orozco (2021). It should be noted that in studies prior to the covid-19 pandemic, lower levels of dependency were recorded for both men and women compared to those found in this study.

Another aspect that we must consider to qualify the lower level of addiction in women is the difference by career and gender, which showed a higher degree of addiction in female students of the Information Technology career. This shows that once women overcome the gap in access, availability, and knowledge, they can present degrees of addiction higher than those registered by men, which suggests that the difference in the degree of addiction to the Internet between men and women is a result of the social construction of gender that is increased by the gap in knowledge of ICTs.

Regarding the specific uses made by young university students, significant differences are observed between university men and women. Although gender stereotypes can be brought to the table, as suggested by Hilbert (2011, quoted in Mancilla et al., 2019), for example, the assumption that indicates a greater "natural" expertise of men in technological media than women, actually, culturally, men are more exposed to the use of digital tools due to gender roles.

Orozco (2021) finds that several studies indicate a higher prevalence of Internet addiction in male children and adolescents when compared to females. She describes that men spend more time on the Internet primarily in individual activities and games and in multiplayer teams and adult sites, while women use social networks intensely. It also finds that university students present longer reaction times with Internet addiction, this means that they take longer to issue responses, which represents a disadvantage in the student's academic and work activities, which is consistent with what we found in the and young university students, since the differences by gender were significant in terms of degree and type of hobby.

Regarding the thoughts of retraction and escape from reality, significant differences were found in favor of young university men from New Leon. Young (2010) explains that addicts generally use interactive environments on the Internet to seek support, security and acceptance that provide a sense of belonging in a non-threatening way. In addition, relationships over the Internet can be culturally varied and, consequently, can look more

glamorous, electronic communication tends to be less inhibited, which can drive the habit of this form of relationship.

Significant differences were also obtained by gender in terms of interpersonal relationships, which young university men from New Leon practice with greater intensity. Internet gambling can be interactive and includes a multitude of activities: playing virtual casinos; participate in multi-user games that require interaction with other users and that some have a fantasy component that allows them to virtually create characterizations of themselves that are interesting for users with low self-esteem; the other form is non-interactive, it includes computer games in which only the user participates as solitaire and which are currently less popular (Young, 2005).

Significant gender differences related to cybersex were found, since New Leon university women show less intensity in this area. Young (2005) and others describe the contributing factors involved in the acquisition, development, and maintenance of emotional or sexual relationships over the Internet, such as cybersex, which is legal, private, inexpensive, and poses no disease risk to the user. of sexual transmission, hides the activity from the partner and there is no obvious evidence, which is used more intensely by young university men from New Leon, which shows that young university men and women from New Leon have a different cultural matrix to relate to, based on the myth of romantic love, while they in the sexual.

It was found that men have less self-regulation in the use of the Internet than women. In this regard, Orozco (2021) identifies in another study (Lawal and Idemudia, 2018) that young men have more sexual compulsiveness than women, associated with Internet addiction and loneliness. While they show a positive and significant correlation with factor 3 (availability of time), which indicates that men have a greater availability of time to use the Internet compared to young university women from New Leon, due to the fact that female students, Due to gender mandates, they spend more time on unpaid and care work than men, so they can spend less time using the Internet.

The difference with men is not only in knowledge or skills but also in opportunities, given the current distribution of care responsibilities, which continue to fall mainly on women, men have more time for the use and knowledge of ICTs ; This situation influences the type of resource accessed by men and women (Mancilla *et al.*, 2019, p. 67).

## Conclusions

This study aimed to identify the degree of Internet addiction and to know the differences according to gender in university students from Nuevo León, Mexico, in times of the covid-19 pandemic. It was found that addiction to a severe degree reached 6.1% of university students, a level higher than that recorded by other studies (Hilt et al., 2015; Orozco, 2021) carried out before the confinement due to the health crisis. In addition, men presented more severe degrees of Internet addiction than women. The results were grouped into three factors that explain the degree of addiction: factor 1, called Self-regulation, related to the need for an Internet connection, factor 2 was named Productivity, linked to low performance problems, and factor 3, Availability. of time, is related to the excessive use of the Internet. There is a negative correlation of factor 1 in men, while factor 3 has a positive correlation in men.

The tests of specific means that are significant in the items of the test according to gender reveal the inclination to certain behaviors linked to the abuse of the use of the Internet, that is, to addiction and it may be that they follow cultural guidelines and constructions according to gender. The prominence and time management suggest that it is a matter of Internet use and intensity that affects university men. This behavior is considered natural given that, as various authors suggest, there are cultural convictions about abilities in men and women. that encourage this inclination. Internet abuse is the result of multiple factors, however, by using a gender approach we can establish that its origin is the result of a context built in the past.

## Future lines of research

Based on the findings in this work, there are aspects that need to be analyzed and completed and that will be addressed in future studies. One is to broaden the investigation to explanatory factors through regression analysis. Also consider, from this same sample, whether the degrees of addiction will remain stable at those levels according to gender after the initial event generated by the pandemic. Analyze in greater detail the grouping of factors for the gender condition, particularly the construction of identities in relation to digital skills acquired by longer use, by socioeconomic condition and study career.

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