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Adaptation of the Nomophobia Questionnaire (NMP-Q) to Spanish in a sample of adolescents

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Introduction. Nomophobia is the fear of being out of mobile phone contact. People suffering from this anxiety disorder have feelings of stress and nervousness when access to their mobiles or computers is not possible. This work is an adaptation and validation study of the Spanish version of the *Nomophobia Questionnaire* (NMP-Q).

Methodology. The study included 306 students (46.1% males and 53.9% females) with ages ranging 13 to 19 years ($Md=15.41\pm 1.22$).

Results. Exploratory factor analysis revealed four dimensions that accounted for 64.4% of total variance. The ordinal α -value was 0.95, ranging from 0.75 to 0.92 across factors. Measure of stability was calculated by the test-retest method ($r=0.823$). Indicators of convergence with the Spanish versions of the "Mobile Phone Problem Use Scale" ($r=0.654$) and the "Generalized Problematic Internet Use Scale" ($r=0.531$) were identified. Problematic mobile phone use patterns were examined taking the 15P, 80P and 95P percentiles as cut-off points. Scores of 39, 87 and 116 on NMP-Q corresponded to occasional, at-risk and problematic users, respectively.

Conclusions. Psychometric analysis shows that the Spanish version of the NMP-Q is a valid and reliable tool for the study of nomophobia.

Keywords: Nomophobia, Validation, Smartphone, Internet

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Adaptación al español del cuestionario *Nomophobia Questionnaire* (NMP-Q) en una muestra de adolescentes

Introducción. La nomofobia se define como el temor a ser incapaz de comunicarse a través del *smartphone*. Es un trastorno que se asocia a ansiedad, nerviosismo, malestar y angustia cuando se pierde el contacto con el *smartphone* o el ordenador. En este estudio instrumental se adaptó al español el *Nomophobia Questionnaire* (NMP-Q).

Metodología. Participaron 306 adolescentes (46,1% varones y 53,9% mujeres), con un rango de 13-19 años ($Md=15,41\pm 1,22$).

Resultados. El análisis factorial exploratorio arrojó una solución de 4 factores que explicó el 66,4% de la varianza total. El alfa ordinal para la puntuación total fue de 0,95, oscilando entre 0,75 y 0,92 para los distintos factores. La estabilidad de la medida ha sido calculada mediante un test-retest ($r=0,823$). Se han obtenido indicadores de convergencia con la versión española de la "*Mobile Phone Problem Use Scale*" ($r=0,654$) y de la "*Generalized Problematic Internet Use Scale*" ($r=0,531$). Se han analizado patrones de uso problemático utilizando los percentiles 15, 80 y 95, que corresponden al usuario ocasional, en riesgo y problemático con puntuaciones de 39, 87 y 116 respectivamente.

Conclusiones. Tras examinar sus propiedades psicométricas, se estima que es una herramienta suficientemente válida y fiable para evaluar la nomofobia.

Palabras clave: Nomofobia, Validación, Teléfono inteligente, Internet

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INTRODUCTION

In the last decades, mobile phones have become an indispensable tool with capabilities that far surpass their original purpose. Thus, smartphones do not only enable users to call or text other people, but they also provide access to the Internet and to all the services available on it. According to several national surveys, smartphones account for 81% of the market share in Spain, and Spain is the country with the greatest smartphone penetration rate in the world^{1,2}. Surveys report that 91.8% of mobile phone owners use their smartphone to surf the Web³ and 63% of youths aged <18 years in Spain own one². Regarding smartphone use time, most users check their phone several times an hour, 25% do it every 30 minutes, and 20% every 10 minutes. Additionally, checking their smartphone is the first and last thing users do after they wake up and before they go to sleep⁴⁻⁶.

The revolution of information and communication technologies (ICT, hereafter) has not only changed the way we communicate and access information, but it has also resulted in the emergence of new phobias and mental disorders⁷. One of the disorders caused by the use of smartphones is nomophobia, which is defined as an intense and irrational fear of being out of mobile phone contact. Nomophobia is an abbreviation of "No-Mobile-phone Phobia" and it is defined as the fear of being unable to communicate through the mobile phone⁸. Nomophobia has also been defined as a modern age disorder that causes anxiety, nervousness, discomfort and anguish caused by being out of contact with a mobile phone or computer⁷.

Specific phobias are common anxiety disorders that precede other psychiatric problems such as depression or substance abuse⁹. More specifically, nomophobia is related to problematic Internet use^{10,11} and the so-called "Internet Use Disorders", which are characterized by excessive time spent engaged in online entertainments, which may interfere with normal daily life, cause preoccupation and inability to disconnect, and generate conflicts with oneself or with others¹².

Whereas mobile phone dependence is defined as a loss of control on phone use that interferes with other activities¹³, nomophobia refers to a pathologic fear. A number of tools have been developed to assess behavioral problems related to ICT use, including the Cellular Phone Dependence Questionnaire (CPDQ)¹⁴, the *Cuestionario de Experiencias Relacionadas con el Móvil (CERM)*¹⁵, the Mobile Phone Dependence Inventory (MPDI)¹⁶ or the Mobile Phone Problem Use Scale (MPPUS)¹⁷. These questionnaires assess mobile phone dependence from an approach different from the pathologic fear that mobile phone users feel at the thought of losing access to information and social networks, and being unable to contact or be contacted. This phobia

generates conflicts related to the need to communicate through the mobile phone and to losing control on autonomy and connectivity¹⁸. This means that although nomophobia is related to abusive mobile phone and Internet use and dependence, it is a different construct. Thus, nomophobia is a specific anxiety disorder that produces different symptoms and behaviors such as obsession for keeping the battery charged, always carrying a charger with oneself, feeling anxious at the thought of being unable to use the phone due to lack of network coverage or flattened battery, trying to avoid places and situations in which the use of the device is banned (theaters, cinemas, etc.), and continuously looking at the phone's screen to see whether messages or calls have been or can be received⁷.

In DSM-5, situational phobias are considered a subtype of specific phobias where the individual is excessively and irrationally afraid of a particular situation or object. In the case of nomophobia, fear is focused on being out of reach of the mobile phone or being unable to use it, situations that nomophobics need to avoid at all costs¹⁸. Despite the emergence of this phobia, it was not until very recently that a specific tool for assessing nomophobia¹⁸ was developed and validated, which explains that a Spanish version had not been created yet.

The purposes of this study included: 1) developing a Spanish version of the Nomophobia Questionnaire (NMP-Q); 2) determining indicators of validity and reliability of measurements in adolescents of the community; 3) establishing correlations between the NMP-Q and the Spanish version of the Mobile Phone Problem Use Scale (MPPUS) and the Generalized Problematic Internet Use Scale (GPIUS2); and 4) identifying problematic mobile phone use patterns using the Spanish version of the NMP-Q.

METHODS

Design and participants

The validation study was performed between September and November 2015. Sampling was incidental and non-parametric. In total, 306 students were included in the study (141 males (43.1%) and 165 females (53.9%). The mean age was 15.41±1.22 ranging from 13 to 19 years. Participants were recruited from three secondary school centers of the regions of Navarra, Asturias and Salamanca, Spain. The distribution of participants was as follows: 144 students (83 males and 61 females) were 3rd- and 4th-year *ESO* students (13-15 years old) and 162 (58 males and 108 females) were 1st- and 2nd-year *Bachiller* students (16-19 years old). A test-retest was performed with 49 students.

Instruments

1. *Nomophobia Questionnaire (NMP-Q)*. The adaptation of NMP-Q to Spanish presents a rigorous content adjustment¹⁹. This task was performed through a translation/back-translation process conducted by bilingual translators and experts in the field²⁰. The resulting questionnaire was revised by three experts proficient in the source language. Finally, the resulting version was revised once again by the research group and an additional translator to ensure that conceptual equivalence had been maintained in all phases of the process. Some enquiries were made to the original authors to guarantee the content validity of the Spanish version with respect to the original questionnaire. As a result, an Item Description Table was developed²¹. Once a final version was obtained, cognitive interviews were conducted with two adolescents to assess the interpretation and adequacy of items. As a result of these interviews, some changes were made to the Item Description Table. Finally, a pilot study was performed with 60 adolescents to evaluate the psychometric performance of the questionnaire. The data obtained in the pilot study did not reveal any psychometric or interpretation problems and were not used for the final version.

NMP-Q explores four dimensions of nomophobia: 1) *Inability to communicate* (six items): feelings about losing instant communication and not being able to use instant communication services. 2) *Losing connectedness* (five items): feelings about losing ubiquitous connectivity. This dimension is related to disconnection from one's online identity, especially on social media. 3) *Inability to retrieve information* (four items): feeling of discomfort caused by the inability to search for information on the Web through the smartphone or the inability to access information anytime. 4) *Giving up convenience* (five items): the feelings of convenience and peace of mind that smartphones provide, especially in relation to battery, coverage and credits. Answers were rated on a five-point Likert scale, where 1 = "strongly disagree" and 7 = "strongly agree". Scores ranged from 20 to 140 points.

2. Spanish version of the "*Mobile Phone Problem Use Scale*" (MPPUS)¹⁷. This questionnaire assesses problematic mobile phone use. Internal consistency was confirmed by a Cronbach's alpha of 0.97. Exploratory factor analysis also revealed good internal validity.
3. Spanish version of "*Generalized Problematic Internet Use Scale*" (GPIUS2)²². This tool consists of 15 items and four subscales: a) preference for online social interaction; b) mood regulation, c) negative consequences and, d) deficient self-regulation. Cronbach's alpha for this

questionnaire ranged from 0.85 to 0.78.

Finally, sociodemographic questions were made related to: 1) time the subject owns a smartphone (between less than a year and more than three years); 2) total time spent using a smartphone during the day (between less than an hour and more than four hours); 3) whether the subject could do without their smartphone for 24 hours (yes/no) and, 4) whether the subject could stop using a smartphone permanently (yes/no).

Procedures

Questionnaires were administered in a classroom setting at the different participating centers under the supervision of a school counselor. Respondents were encouraged to give truthful answers, to avoid taking too much time to answer a specific question, and to write down any doubt in the last page. The time taken by respondents to complete the questionnaire ranged from 14 to 20 minutes. Subjects participated voluntarily and anonymously. No compensation was offered for participating in the project. Following authorization by the principal of the center, all participants gave consent to participate in the study.

Data Analysis

First, a descriptive analysis of the scores obtained on the Spanish version of the NMP-Q was performed stratified by sex, age, education center and educational level. Scores were compared to identify gender-based differences using either Student's *t*-test for independent variables or analysis of variance (ANOVA). Cohen's *d* was calculated when statistically significant differences were found to estimate the effect size of the difference.

Next, an exploratory factor analysis was performed using parallel analysis²³. Unweighted Least Squares (ULS)²⁴ applied to polychoric correlations and Promin rotation²⁵ were used as the methods for factor extraction. Internal consistency of the overall score was calculated using ordinal alpha coefficient.

Age-adjusted Pearson's correlation between the overall scores obtained on the Spanish version of the NMP-Q and the Spanish versions of MPPUS and GPIUS2 were analyzed to produce evidence of convergent validity. Indicators of discriminant validity were determined by comparing NMP-Q scores (using Student's *t*-test for independent variables) according to different demographic variables. Data analyses were performed using SPSS version 21 (IBM®) and FACTOR 9.2²⁶.

RESULTS

Females obtained higher scores on items 8, 9 and 15 ($p < 0.001$), and the effect size was low in all cases (< 0.3). Age-based differences were also observed in items 4, 16, 17, 18, and 20 ($p < 0.001$), as 14-15 years-old students obtained higher scores, with a low size effect (< 0.3). No differences were found in relation to the education center ($p < 0.389$).

A total of 166 participants (54.2%) had owned a smartphone for more than three years vs. six subjects (1.7%) who only had owned a smartphone for less than a year (all were 14-15 years-old students). Seventy-four subjects (24.2%) spent more than four hours a day using their smartphone vs. only nine (2.5%) who reported to use it less than an hour a day. A percentage of 17.3% stated that they could not do without their smartphone for 24 hours and 79.4% affirmed that they could not stop using a smartphone permanently.

Evidences of validity of the Spanish version of the NMP-Q

Table 1 displays the psychometric markers for NMP-Q items expressed as mean values, SD and item-to-total correlations.

As to the exploratory factor analysis, Kaiser-Meyer-Olkin and Bartlett sphericity test results were 0.945 and $\chi^2 = 4551.0$, respectively ($p < 0.001$). Inter-item correlations were appropriate for exploratory factor analysis. Four dimensions explained 66.4% of total variance. The first factor explains 47.9%, the second 8.0%, the third 6.4% and the fourth explains 5.0% of variance. Goodness of Fit Index (GFI) was 1. Table 2 shows inter-item correlations.

Table 3 shows item loadings on factors and their association with each dimension. The values obtained for the Spanish version are compared with those reported for the original version¹⁸.

Table 4 displays the descriptive analysis and ordinal alpha values for the four dimensions. The mean raw score on the questionnaire was 67.31 ± 25.70 . The mean score for the first factor was 22.57 ± 9.57 , for the second was 14.23 ± 7.15 , for the third was 14.27 ± 5.59 , and for the third was 16.24 ± 6.88 . The ordinal alpha value for the overall score was 0.95. Test-retest yielded an $r = .823$ ($p < 0.001$).

As to convergent validity, age-controlled partial correlations were estimated between the overall score on the Spanish NMP-Q and GPIUS2 ($r = 0.531$; $p < 0.001$) and between NMP-Q and MPPUS ($r = 0.654$; $p < 0.001$). Significant positive correlations were observed between all NMP-Q dimensions and GPIUS2. Notably, factor 1 of NMP-Q "inability to communicate" was found to correlate with

GPIUS2 dimensions "cognitive preoccupation" ($r = 0.592$; $p < 0.001$) and "compulsive use" ($r = 0.363$; $p < 0.001$).

To determine markers of discriminant validity, the mean scores obtained by the respondents who stated that they could not do without their smartphone for 24 hours ($n = 53$; 91.06 ± 23.22) were compared with those of the subjects who could ($n = 253$; 62.33 ± 23.33), $t = 8.16$; $p < 0.001$. Similarly, the mean scores of the respondents who could not stop using a smartphone permanently ($n = 243$; 73.022 ± 23.50) were compared with those of the subjects who could ($n = 62$; 44.01 ± 19.48), $t = 10.01$; $p < 0.001$.

Patterns of problematic use identified with the Spanish version of the NMP-Q

The total score on NMP-Q ranges from 20 to 140 points. The higher the score, the more severe nomophobia is. The mean score obtained in our study was 67.31 ± 25.70 ranging from 20 to 132. Problematic use was classified using the most restrictive statistic criterion, which is the one used in research on pathologic gambling and problematic mobile phone use. Classification was based on the 15th, 80th and 95th percentiles, which correspond to "occasional user", "user at risk", and "problematic user", respectively^{12,27}. Regarding the total sample, these percentiles correspond to scores 39, 87 and 116 on NMP-Q, respectively. It was found that 14.4% of subjects scored below the 15th percentile, 66.4% scored between the 15th and 80th percentile, and 4.6% scored above the 95th percentile. Significant differences were observed in scores between *ESO* students (13-15 years old) (71.39 ± 27.33) and *Bachiller* students (16-19 years old) (63.67 ± 23.64)- $t = 2.623$; $p < 0.009$ -. Table 5 shows the scores for the 15th, 80th and 95th percentiles stratified by sex and age range.

CONCLUSIONS

NMP-Q is the first questionnaire to specifically approach subject-mobile phone relationship in terms of the fear mobile phone users experience at the thought of losing access to information and social networks and being unable to contact and be contacted. According to the authors of the original NMP-Q¹⁸, for nomophobic subjects, the inability to use their smartphone is not only a matter of communication where they cannot contact and be contacted by other people, but it is also a temporary disconnection from one's online identity on social media, to which they access through their smartphone. This approach is qualitatively different from other related constructs such as problematic Internet use^{10,11}, mobile phone –especially smartphone– addiction^{13,28,29}, and problematic mobile phone use¹⁷. However, despite the differences among constructs, correlations were expected to occur due to their comorbidity. Thus, direct pos-

Table 1		Means, SD and item-to-total relation for the 20 items of NMP-Q (n=306)		
		M	SD	IT
1.	Me sentiría mal si no pudiera acceder en cualquier momento a la información a través de mi <i>smartphone</i> .	3.49	1.67	0.606
2.	Me molestaría si no pudiera consultar información a través de mi <i>smartphone</i> cuando quisiera.	4.02	1.71	0.614
3.	Me pondría nervioso/a si no pudiera acceder a las noticias (p. ej. sucesos, predicción meteorológica, etc.) a través de mi <i>smartphone</i> .	2.52	1.59	0.546
4.	Me molestaría si no pudiera utilizar mi <i>smartphone</i> y/o sus aplicaciones cuando quisiera.	4.24	1.82	0.679
5.	Me daría miedo si mi <i>smartphone</i> se quedase sin batería.	2.73	1.82	0.672
6.	Me daría algo si estuviera a punto de quedarme sin saldo o de alcanzar mi límite de gasto mensual.	2.34	1.62	0.536
7.	Si me quedara sin señal de datos o no pudiera conectarme a una red Wi-Fi, estaría comprobando constantemente si he recuperado la señal o logro encontrar una red.	4.00	2.01	0.701
8.	Si no pudiera utilizar mi <i>smartphone</i> , tendría miedo de quedarme tirado/a en alguna parte.	3.55	1.89	0.515
9.	Si no pudiera consultar mi <i>smartphone</i> durante un rato, sentiría deseos de hacerlo.	3.62	1.85	0.689
10.	Me inquietaría por no poder comunicarme al momento con mi familia y/o amigos.	3.82	1.86	0.791
11.	Me preocuparía porque mi familia y/o amigos no podrían contactar conmigo.	4.12	1.77	0.673
12.	Me pondría nervioso/a por no poder recibir mensajes de texto ni llamadas.	3.58	1.92	0.835
13.	Estaría inquieto por no poder mantenerme en contacto con mi familia y/o amigos.	3.91	1.78	0.787
14.	Me pondría nervioso/a por no poder saber si alguien ha intentado contactar conmigo.	3.82	1.89	0.766
15.	Me inquietaría por haber dejado de estar constantemente en contacto con mi familia y/o amigos.	3.31	1.76	0.777
16.	Me pondría nervioso/a por estar desconectado/a de mi identidad virtual.	2.76	1.68	0.790
17.	Me sentiría mal por no poder mantenerme al día de lo que ocurre en los medios de comunicación y redes sociales.	3.11	1.79	0.751
18.	Me sentiría incómodo/a por no poder consultar las notificaciones sobre mis conexiones y redes virtuales.	3.09	1.77	0.788
19.	Me agobiaría por no poder comprobar si tengo nuevos mensajes de correo electrónico.	2.47	1.68	0.568
20.	Me sentiría raro/a porque no sabría qué hacer.	2.81	1.86	0.584

M: arithmetic mean; SD: Standard Deviation; IT: Corrected item-to-total correlation

itive correlations were found between NMP-Q and the Spanish versions of GPIUS-2 and MPPUS.

Additionally, based on the evidence obtained in our study of the reliability and internal validity of this version of NMP-Q, it can be stated that the Spanish version created by our

research group is conceptually and methodologically rigorous. The design of the Spanish version complies with the conceptual framework of the original authors, which has been proven to have adequate content validity of nomophobia^{18,19}. On the other hand, it is worth mentioning that in some cases, we used different methods of analysis (e.g. exploratory factor

Table 2		Correlations between factors in the Spanish version of NMP-Q (n=306)		
	Factor 1	Factor 2	Factor 3	
Factor 2	0.788			
Factor 3	0.736	0.633		
Factor 4	0.689	0.672	0.580	

item correlations (discrimination), estimating polychoric correlations was considered more appropriate than calculating Pearson's correlation coefficients. In addition, whereas principal component exploratory factor analysis with Varimax rotation was performed on the original version¹⁸, we opted for Parallel Analysis using Unweighted Least Squares (ULS) and Promin rotation as the method for factor extraction instead^{24,25}. Although we consider this procedure was more appropriate for analysis than the one used for the original

Table 3		Item loadings on factors and correlation with values for the original NMP-Q (n=306)					
ITEM	Factor 1	Factor 2	Factor 3	Factor 4	Yildirim Et Correia factor (2015)	Yildirim Et Correia factor loading (2015)	
1	0.534	0.472	0.780	0.432	3	0.668	
2	0.504	0.521	0.887	0.418	3	0.830	
3	0.492	0.408	0.502	0.462	3	0.605	
4	0.610	0.564	0.722	0.473	3	0.764	
5	0.621	0.517	0.467	0.776	4	0.708	
6	0.491	0.421	0.333	0.819	4	0.623	
7	0.671	0.592	0.574	0.631	4	0.669	
8	0.398	0.524	0.437	0.537	4	0.672	
9	0.457	0.464	0.479	0.518	4	0.473	
10	0.832	0.671	0.548	0.601	1	0.753	
11	0.793	0.523	0.414	0.510	1	0.861	
12	0.825	0.769	0.608	0.589	1	0.782	
13	0.889	0.657	0.503	0.570	1	0.836	
14	0.785	0.705	0.515	0.528	1	0.778	
15	0.753	0.741	0.586	0.452	1	0.646	
16	0.654	0.807	0.633	0.512	2	0.838	
17	0.616	0.799	0.557	0.521	2	0.835	
18	0.628	0.865	0.595	0.522	2	0.800	
19	0.447	0.574	0.464	0.352	2	0.512	
20	0.471	0.595	0.467	0.443	2	0.523	

* Item inconsistencies between the Spanish and the English version

analysis) from the ones used for the original questionnaire. Thus, in light of the mean values and asymmetry coefficients (position) obtained for all items and the magnitude of inter-

version, the results obtained were consistent with those of the original study (see Table 3). Only a slight inconsistency was observed in the loadings of two items on factor 4 (where they

Table 4	Mean, SD and Ordinal alpha (n=306) for NMP-Q dimensions		
	Mean	SD	Ordinal alpha
Factor 1. Not being able to communicate	3.76	0.88	0.92
Factor 2. Losing connectedness	2.85	0.83	0.85
Factor 3. Not being able to access information	3.51	0.77	0.80
Factor 4. Giving up convenience	3.25	0.69	0.79

Table 5	Scores for the 15th, 80th and 95th percentiles by age and sex (n=306)			
13-16 years Males n=83	P ₁₅ =36 P ₈₀ =94 P ₉₅ =118	14-16 years Females n=61	P ₁₅ =47 P ₈₀ =99 P ₉₅ =123	
17-19 years Males n=58	P ₁₅ =32 P ₈₀ =80 P ₉₅ =108	17-19 years Females n=104	P ₁₅ =40 P ₈₀ =84 P ₉₅ =108	

should theoretically have a higher loading). Item loadings on factors 1 and 4 were 0.671 and 0.631, respectively. The reason is that this item ("losing network coverage or WI-FI access") may have been conceptualized as a handicap to communication (factor 1) due to the clear impeding role that it has for communication, rather than being associated with the feelings of convenience and peace of mind that having coverage or WI-FI access causes. Anyway, to maintain consistency with the theoretical framework of the original authors, we decided to leave item 7 in factor 4, as differences were very small.

Notably, this questionnaire identifies differences between subjects reporting not being able to do without their smartphone for 24 hours or permanently. Scores were significantly higher ($p < 0.001$) in these two groups as compared to subjects who stated that they could live without their smartphone temporarily or permanently.

As to the preliminary data obtained on the profile of problematic smartphone users, data were stratified by sex and age, as follows: 1) occasional user (15th percentile), with scores ranging from 32 and 47; 2) user at risk (80th percentile), with scores ranging from 80 to 99; and 3) problematic user (95th percentile), with scores ranging from

108 to 123. As in other constructs^{17,27} estimations were performed cautiously and further research will be necessary.

Since it has not been until very recently that a tool for assessing nomophobia has been validated, scarce prevalence data have been published on nomophobia. Yet, Yildirim et al. found that 42.6% of young adults in Turkey were nomophobic^{18,30}, which is consistent with our results. Another study using a different assessment tool reported a prevalence of nomophobia of 66%, with a higher prevalence in women and youths aged 14 to 16 years³¹. This is supported by our findings, as scores were higher in these two groups, which suggests that women and youths aged 14 to 16 years may be high-risk groups for nomophobia. Additionally, differences were observed between *ESO* (13 to 16 years) and *Bachiller* (16-18) students. This may be due to the psycho-evolutionary processes inherent to early adolescence (*ESO*) and middle adolescence (*Bachiller*)³². Nevertheless, in light of the high scores reported in the different studies, it is clear that nomophobia can become a major mental disorder over time, with a great impact on subjects' life.

This study has some limitations that should be solved in the future, namely: 1) The sample size calculated was relatively small. Yet, the sample size complies with general guidelines pertaining to factor loadings and number of items per factor (> 300)³³. 2) Sampling was non-parametric and incidental. Although differences were not observed among educational centers, sampling should be randomized in future research. 3) Some bias –such as social desirability bias– may have occurred while completing the questionnaire. Further studies should be conducted to identify more indicators of validity and reliability and establish their relationship with psychosocial problems such as cyberbullying or pathologic online gambling. More efforts should be made to assess the internal validity of the questionnaire through confirmatory factorial analysis and the identification of indicators of predictive validity. It would also be interesting to analyze problematic use patterns related to nomophobia in clinical samples of mobile phone addicts. Although this study provides data on the prevalence of nomophobia in adolescents, research should be performed in the future to assess the performance of NMP-Q in specific clinical samples of adolescents with mobile phone dependence.

To conclude, the authors have created a reliable Spanish version of the NMP-Q for assessing nomophobia with appropriate indicators of reliability and validity.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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