

PSYCHOMETRIC PROPERTIES OF THE GENERAL HEALTH QUESTIONNAIRE (GHQ-30) IN UNIVERSITY STUDENTS

PROPIEDADES PSICOMÉTRICAS DEL CUESTIONARIO GENERAL DE SALUD (GHQ-30) EN ESTUDIANTES UNIVERSITARIOS

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RESUMEN

La salud percibida, definida como la evaluación subjetiva de un individuo sobre su propio estado de salud físico y/o mental, está relacionada profundamente con el bienestar general y la adopción de comportamientos saludables. El presente estudio tuvo por objetivo evaluar las propiedades psicométricas del Cuestionario General de Salud (GHQ 30) en estudiantes de tres universidades de la Ciudad de México. La investigación tuvo un diseño exploratorio ex post facto y por medio de un muestreo no probabilístico se reclutaron 299 estudiantes universitarios hombres y mujeres, de 18 a 25 años de los cuales 144 (48%) fueron hombres y 159 (53%) fueron mujeres. El análisis de datos mostró una adecuada consistencia interna ($\alpha = .86$), una estructura de cuatro factores que miden síntomas de depresión, sentimientos de incompetencia, ansiedad y alteraciones del sueño, que explicó el 61.2% de la varianza y el análisis factorial confirmatorio arrojó adecuados índices de bondad de ajuste (X^2 entre los grados de libertad = $206.312/127 = 1.62$, CFI = .94, RMSEA = .05 [IC = .041 - .068], NFI = .87; IFI = .94). En conclusión, el instrumento es adecuado para evaluar la salud percibida en estudiantes universitarios mexicanos.

Palabras clave: ansiedad, depresión, estudiantes, psicometría, salud mental.

ABSTRACT

Perceived health, defined as an individual's subjective assessment of their physical and mental health status, is closely linked to overall well-being and adopting healthy behaviours. This study aimed to evaluate the psychometric properties of the General Health Questionnaire (GHQ 3) in university students in Mexico. The research had an exploratory ex post facto design. Using non-probabilistic sampling, 299 university students aged 18 to 25 were recruited; 144 (48%) were men and 159 (53%) were women. Data analysis showed adequate internal consistency ($\alpha = .86$), a five-factor structure measuring symptoms of depression, feelings of incompetence, and sleep disturbance, which explained 61.2% of the

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variance. Confirmatory factor analysis yielded satisfactory goodness-of-fit indices (X^2 degrees of freedom = 206.312/127 = 1.62, CFI = .94, RMSEA = .05 [IC = .041 - .068], NFI = .87; IFI = .94). In conclusion, the instrument is suitable for assessing perceived health in Mexican university students.

Keywords: anxiety, depression, students, psychometrics, mental health.

INTRODUCTION

Health perception, the subjective assessment an individual makes of their physical and mental state, plays a fundamental role in general well-being and adopting healthy behaviours. This construct not only reflects the presence or absence of disease but can also be an indicator of the quality of life and the ability of people to adapt to the physical and psychological challenges of their everyday lives (Castro-Vázquez et al., 2007; Choi & Sung, 2013; Solís-Cámara et al., 2016).

Given the importance of this construct, the field of clinical and health psychology research has developed various assessment instruments to measure perceived health (Leung et al., 2007; Smith et al., 1995; Tinajero-Chávez et al., 2023; Togari et al., 2004), one of the most used ones worldwide being the General Health Questionnaire (GHQ) designed by Goldberg et al. (1970). The GHQ was originally a 60-item questionnaire divided into four factors assessing depression, social dysfunction, anxiety, and hypochondria (Goldberg & Hillier, 1979), designed to detect the severity of minor psychiatric disorders (García-Viniegras, 1999).

The GHQ is clinically significant since, because of its factorial structure, it accurately screens for some of the most prevalent mental health disorders in primary care, where healthcare users often show a combination of anxiety, depressive symptoms, somatisation, and social difficulties (Balsategui & Rodríguez, 2011; Sartorius et al., 1996; Vega-Dienstmaier, 2022). Throughout its adaptations, it has been pointed out that the symptomatic dimensions measured by the GHQ may differ between different cultures or countries and that a particular scale measuring a critical clinical dimension, such as depression, may comprise different items in other places (Goldberg & Williams, 1988; Werneke et al., 2000).

It is interesting how the various iterations of the GHQ have spawned alternative versions of the instrument. The best-known ones are the GHQ 60 (Goldberg et al., 1970), GHQ 30 (Goldberg et al., 1976), GHQ 28 (Goldberg & Hillier, 1979) and GHQ 12 (Goldberg & Williams, 1988). Each version has been renamed based on the number of items in its final structure. However, it is also possible to find studies of the psychometric

properties of these versions with a different number of factors and items (Iwata et al., 1994; Moreta-Herrera et al., 2021; Penninkilampi-Kerola et al., 2006; Prady et al., 2013; Schnitz et al., 1999; Willmott et al., 2008). Despite the large number of adaptations and the marginal differences in the number of items comprising the factors in the final versions of the scales, the relative stability of most of the factors comprising this questionnaire across different studies is an indicator of the validity of the instrument (Werneke et al., 2000).

In Mexico, psychometric analysis of the 12-item version has been conducted among the general population (Solís-Cámara et al., 2016), with one study analysing the 60, 28 and 30-item versions of the scale in hospital patients (Medina-Mora et al., 1983). This latest research led to versions of the instrument that continue to be applied in different settings, although the age of this study casts doubts on the current validity of the GHQ. Another relatively recent study was conducted by Silva-Gutiérrez and De la Cruz-Guzmán (2017), who explored the psychometric properties of the GHQ 28 in a university population, finding adequate internal consistency. However, this study does not include confirmatory factor analysis, so it is important to continue exploring the instrument's factor structure to find evidence of construct validity.

Against this background, the objective of the present study was to analyse the psychometric properties of GHQ 30 in university students. This version was derived from the GHQ-60 in a study where symptoms typically present in people with purely physical illnesses were excluded. It can be regarded as a measure of primarily psychological symptoms (Goldberg et al., 1976; Huppert et al., 1989). This is particularly relevant when assessing a relatively young population such as university students, who tend to have a lower burden of physical illness yet are exposed to a range of psychosocial risk factors for the development of mental health problems due to the adaptively demanding lives they lead (Madeha, 2013; Martínez-Otero, 2014; Sheldon et al., 2021; Silva-Gutiérrez & De la Cruz-Guzmán, 2017). Some data even point to gender differences in this regard since women appear to be at higher risk of displaying mental health problems (Cuenca Robles et al., 2020; Sheldon et al., 2021).

Today, we know that the university population experiences a range of mental health disorders due to variables such as the intellectual and emotional effort required in their degree courses, concern over the future in relation to their academic performance (Bedoya-Lau et al., 2006; Madeha, 2013), exhaustion caused by the high academic workload or engaging in parallel activities such as working while studying. This is compounded by the adaptive demands characteristic of the lives of adult human beings during this period (Aldiabat et al., 2014; Bedoya-Lau et al., 2006; Macaskill, 2012). These factors can trigger problems such as decreased academic performance (Martínez-Otero, 2014), isolation, absenteeism and a series of psychological disorders such as depression, anxiety, interpersonal issues, irritability, difficulty making decisions, restlessness, tension, fatigue, sleep problems, and the use of alcohol, tobacco or other drugs (Sheldon et al., 2021; Zaid, 2013).

These data are significant since, in addition to their impact on the academic sphere, a high proportion of mental health problems in young people result in premature deaths due to accidents, suicides, violence, pregnancy complications and diseases that could have been prevented or treated (Pan American Health Organization [PAHO], 2017). In this respect, the mental health of young people is an issue that fails to receive the necessary attention (Cuenca Robles et al., 2020).

Some authors point out that the timely detection of mental health problems in young students remains a pending task in Latin America since, compared to the general population, its detection is usually slower and tends to take place once apparent mental health problems have developed (Brown, 2018; Cuenca Robles et al., 2020). The Pan American Health Organization provides alarming data on the difficulty of timely detection: 30% of mortality in young people in Latin America is associated with suicide, and of this percentage, half the cases were never diagnosed, much less treated in time (PAHO, 2017).

This research has enabled us to recognise the importance of continuing to explore mental health in university students, not only in epidemiological terms but also to develop a more significant number of tools that allow for early detection and encourage the implementation of preventive and treatment actions. This makes a review of the psychometric properties of the GHQ-30 essential since it is a brief, low-cost instrument with the potential to detect suicide risk and the most common psychological disorders in primary mental health care.

The present study posits the following hypotheses:

Hypothesis 1. The questionnaire will have a similar factorial structure to previous studies (Goldberg et al., 1976; Medina-Mora et al., 1983) with a factor loading $\geq .40$ in each item, and its leading adaptation indices will be sufficient (root mean square error of approximation [RMSEA] $<.08$, comparative fit index [CFI] $>.80$).

Hypothesis 2. The questionnaire will have medium-high internal consistency according to Cronbach's alpha and McDonald's omega coefficients based on the results of similar articles (Goldberg et al., 1976; Medina-Mora et al., 1983).

METHOD

Type of Study

This is a non-experimental, exploratory, cross-sectional study with an ex post facto design.

Participants

Participants were selected through intentional non-probabilistic sampling at three private universities in Mexico City. The inclusion criteria were those aged 18 to 25, currently enrolled in any semester, and willing to participate voluntarily in the study. The total sample comprised 299 participants, 144 (48%) men and 159 (53%) women, with an average age of 21.6 (SD 2.01) years. Other data on participants are shown in Table 1.

Table 1
Sociodemographic Data of Participants

Sex	Frequency	Percentage
Male	144	48%
Female	159	53%
Degree Course		
Economics	37	12.3 %
Actuarial science	22	7.3 %
Finance	15	5 %
Law	12	4 %
International relations	10	3.3 %
Business	8	2.6 %
Administration	7	2.3 %
Computer Science	7	2.3 %
Mathematics	7	2.3 %
Accountancy	6	2 %

Table 1 (continuation)
Sociodemographic Data of Participants

Political Sciences	5	1.6 %
Mechatronics	4	1.3 %
Industrial engineering	1	.33 %
Preferred not to say	158	52.8 %
Semester		
8	22	7.3 %
10	18	6 %
2	16	5.3 %
7	16	5.3 %
9	16	5.3 %
6	14	4.6 %
5	13	4.3 %
4	12	4 %
3	9	3 %
11	3	1 %
1	1	.3 %
2	1	.3 %
Preferred not to say	158	52.8 %

Procedure

The authorities at three private universities in Mexico City were contacted to inform them of the study's objectives and invite them to participate. If they expressed interest, the means of inviting students to participate in the research were agreed upon. The study was disseminated among participating educational institutions for recruitment as part of a mental health promotion campaign. This dissemination was carried out through posters put up inside the universities and emails sent to students by the institutional communication departments of each university, which, in addition to promoting participation in mental health promotion activities, informed students of the study being conducted.

If students were interested in participating, they could click on a link displaying an electronic Google Forms form with instructions and informed consent forms to participate. This recruitment process took place between August and December 2023. Once participants had accessed the form through the information on the dissemination posters or the emails they received, a message was displayed explaining the objective of the research, the content of the questionnaire they would answer, the request for agreement to

participate in the study voluntarily, and the guarantee of the anonymity and confidentiality of the data collected. If the student agreed to participate, the questionnaire was displayed, informing them that they could drop out at any time if they so wished.

Of the total sample, data from the first 90 participants (40 women and 50 men) were used to perform an internal consistency analysis of the instrument and exploratory factor analysis. Data from the following 209 participants (104 men and 105 women) were used to perform confirmatory factor analysis. At the end of the questionnaire, all participants received feedback on their results, information on mental health care services, and contacts they could contact for guidance. All study Procedures were approved by the Casa Grana research ethics committee, protocol number CG01/2023, in strict compliance with the ethical guidelines of the participating institutions, the Universal Declaration of Ethical Principles for Psychologists International Union of Psychological Science [IUPS], 2008), and the Declaration of Helsinki-Ethical Principles for Medical Research Involving Human Subjects (World Medical Association, 2013).

Instrument

General Health Questionnaire GHQ-30 (Goldberg et al., 1976; Huppert et al., 1989). This instrument is a 30-item, Likert-type questionnaire with four response options and a five-factor structure comprising 1. Anxiety, worry and tension (ten items), 2. Feelings of incompetence or low self-esteem (six items), 3. Depression and hopelessness (five items), 4. Difficulty coping (five items), and 5. Social dysfunction (four items). The results of the psychometric evaluations of the GHQ-30 have shown adequate internal consistency indices.

Data Analysis

Data analysis was performed using SPSS software version 25 (IBM Corp, 2017) and JASP program version 0.19 (JASP Team, 2024). Cronbach's Alpha and McDonald's Omega coefficients were obtained to analyse internal consistency. To determine whether it was appropriate to perform exploratory factor analysis (EFA), the Kaiser-Meyer-Olkin analysis was conducted to gauge the adequacy of the sample size and the Bartlett sphericity analysis was subsequently conducted to check the redundancy between the variables collected and the factors in the instrument. EFA was subsequently performed using the minimum residual method. A

Promax rotation was used from a polychoric correlation matrix during this process. A factor loading lower than .40 was taken as an elimination criterion, and the number of factors was determined using the parallel analysis method.

Confirmatory factor analysis (CFA) was subsequently conducted using the structural equation method (Byrne, 2001; Kline, 2005). For this analysis, the variances of the error terms were set as free parameters and the maximum likelihood estimation was used, which is an appropriate method for this type of analysis, according to Ferrando Piera et al. (2022). The goodness-of-fit indices used were χ^2 . This quotient was divided by the degrees of freedom. To be considered a good fit, the result should be < 2 according to the recommendations of various authors (Alavi et al., 2020; Cole, 1987; McNeish & Hancock, 2017; Wheaton et al., 1977). Bentler's comparative fit index (CFI) (the closer the value is to .90, the better the fit) (Byrne, 2001) and the root mean square error of approximation (RMSEA; a relative fit $> .08$ is generally considered a good fit). In the normalised fit index (NFI) and the incremental fit index (IFI) in these two indicators, a relative fit $> .90$ is generally considered a good fit. Finally, a student's t-test for independent samples was per-

formed to determine whether the questionnaire scores obtained differed by sex.

Results

After examining internal consistency, an adequate level of internal consistency was detected for the scale according to the Alpha and Omega coefficients (Table 1). In addition, the Kaiser-Meyer-Olkin analysis yielded a result of .816, while the Bartlett sphericity test produced a statistic of 1315.139 ($df = 153, p < .001$). These findings suggested the feasibility of performing exploratory factor analysis (EFA).

The EFA yielded a four-factor solution, which explained 61.2% of the variance together. The factors were called the same as those in the original version of the instrument: 1. Depression and hopelessness, which explores symptoms of hopelessness and suicidal ideation; 2. Feelings of incompetence or low self-esteem, which examines the perceived ability to achieve and feelings of ineffectiveness, 3. Anxiety, worry or tension, which explores physiological and cognitive symptoms related to these variables; 4. Sleep disturbance evaluates the presence of symptoms that affect rest and the stability of this process. A summary of this information is given below in Table 2.

Table 2

Results of the Internal Consistency Analysis and Exploratory Factor Analysis of the Scale

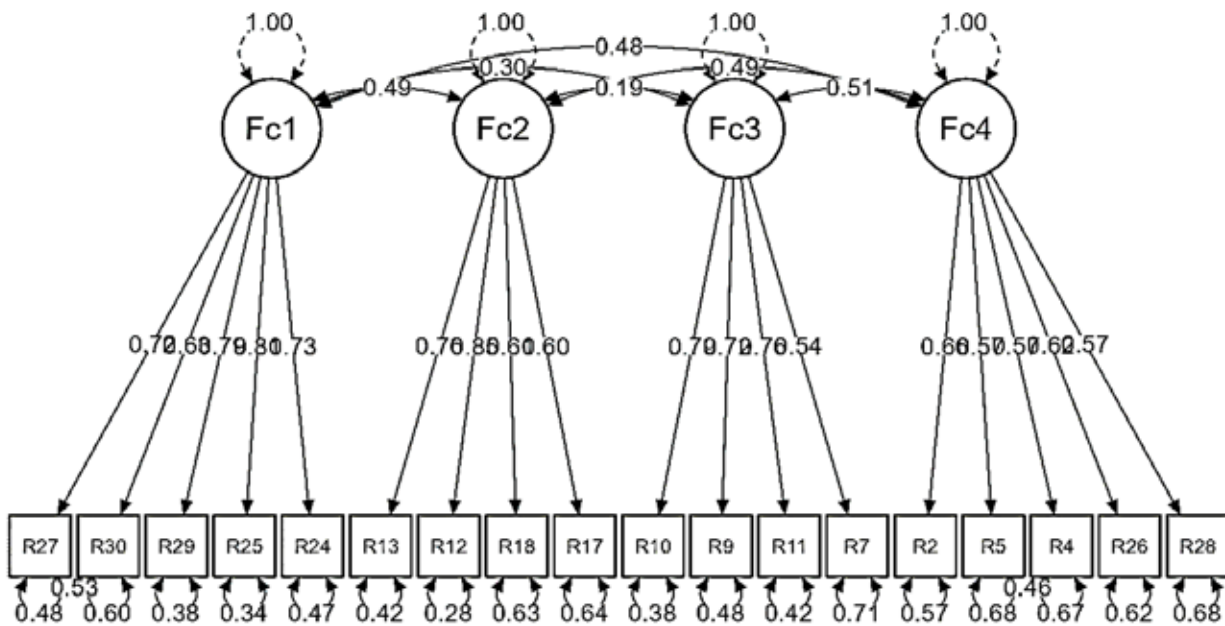
ITEMS	Factors			
	1. Depression and hopelessness	2. Feelings of inadequacy	3. Anxiety, worry, tension	4. Sleep disturbance
27. Have you thought about the possibility of taking your life?	0.963	-0.117	0.125	0.104
30. Have you noticed that the idea of taking your life repeatedly comes to mind?	0.848	-0.083	-0.122	0.276
29. Have you ever wished you were dead and away from it all?	0.796	0.087	0.019	0.256
25. Do you feel like you can't expect anything from life?	0.776	0.239	-0.054	0.246
24. Have you ever thought that you are worthless?	0.652	0.197	0.041	0.393
13. Have you been satisfied with the way you do things?	0.012	0.843	-0.007	0.302
12. Have you felt that you generally do things, right?	0.021	0.828	-0.008	0.257
18. Do you feel unable to solve your problems?	0.064	0.655	0.017	0.524
17. Have you felt able to make decisions?	-0.017	0.645	0.125	0.566

Table 2 (continued)
Results of the Internal Consistency Analysis and Exploratory Factor Analysis of the Scale

10. Have you had difficulty sleeping through the night without waking up until the next morning?	-0.003	-0.051	.920	0.171	
9. Have you had difficulty falling or staying asleep?	0.071	0.007	.757	0.400	
11. Have you had restless or uneasy nights?	-0.037	0.169	.753	0.339	
7. Do you wake up too early and find it impossible to go back to sleep?	0.098	-0.101	.517	0.605	
2. Have you ever felt exhausted and without strength for anything?	0.051	0.227	0.134	.815	
5. Have you had a feeling of heaviness in your head or felt that your head was going to explode?	-0.099	-0.026	0.062	.739	
4. Have you had headaches?	0.114	-0.030	-0.012	.627	
26. Have you ever felt nervous and about to explode?	0.101	0.044	-0.034	.504	
28. Have you noticed that sometimes you can't do anything because you are so nervous?	0.018	0.088	0.049	.481	
Explained variance:	Total = 61.2%	17.91%	15.24%	14.22%	13.89%
Internal consistency:					
Cronbach's alpha $\alpha = .86$	$\alpha = .86$	$\alpha = .80$	$\alpha = .75$	$\alpha = .79$	$\alpha = .79$
McDonald's Omega $\omega = .84$	$\omega = .86$	$\omega = .79$	$\omega = .80$	$\omega = .75$	$\omega = .75$

When CFA was subsequently performed, the four-factor structure was confirmed, and acceptable goodness-of-fit indices were obtained: $X^2/df = 206.312/127 = 1.62$ (p -value $< .01$), CFI = .94; RMSEA = .05; NFI = .87; IFI = .94). The corresponding diagram and factor loadings can be observed in Figure 1.

Figure 1
GHQ Four-Factor Solution



At the same time, the average scores of each study's factors were identified for the total population (Table 3) and the participants grouped by sex (Table 4).

Table 3
Average Scores and Standard Deviation of Total Sample

Factors	Average	Deviation standard
Depression and hopelessness	3.37	3.88
Feelings of inadequacy	6.70	3.65
Anxiety, worry, tension	7	2.70
Sleep disturbance	4.69	3.23
Complete scale	21.77	9.52

Table 4
Average Scores and Standard Deviation by Sex of Participants

Factors	Men Mean (SD)	Women Mean (SD)
Depression and hopelessness	3.02 (3.97)	3.72 (3.77)
Feelings of inadequacy	6.51 (2.92)	7.47 (2.38)
Anxiety, worry, tension	5.56 (3.42)	7.82 (3.54)
Sleep disturbance	4.61 (3.08)	4.78 (3.39)
Complete scale	19.73 (9.60)	23.80 (9.05)

Finally, the results were examined to determine whether there were differences in the scores between men and women, yielding significant differences in the scores for Factor 2 concerning feelings of incompetence ($t=2.59$, $gl=198$, $p < .01$) and Factor 3 relating to anxiety, worry and tension ($t=4.68$, $gl=207$, $p < .01$). In both cases, women scored higher than men.

Discussion

The study's results generally showed that the test has adequate psychometric properties. Internal consistency was sufficient, suggesting that the questionnaire is reliable for assessing perceived health in this population. This generally coincides with the data found in other GHQ studies in Mexico (Medina-Mora et al., 1983; Silva-Gutiérrez & De la Cruz-Guzmán, 2017; Solís-Cámara et al., 2016).

Conclusions

This research provides an updated view of the psychometric properties of the General Health Questionnaire (GHQ-30) among university students in Mexico. The data suggest that the instrument is an adequate resource for evaluating perceived health in university students.

Given the study's limitations, future research should consider using a larger sample of students from various universities who have collected sociodemographic and health data. This would make it possible to analyse the instrument's behaviour with various groups and the association between test scores and psychological constructs such as academic stress and quality of life. It would also make it possible to establish norms and gauge the severity of the identified problem.

Another opportunity for future studies would be to explore the test's usefulness as a screening instrument that permits the timely detection of mental health problems and as part of the indicators of clinical change, including the pre-and post-treatment evaluations of a treatment or intervention.

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APPENDIX A

Final Version of the General Health Questionnaire for University Students

This questionnaire assesses your overall health and determines whether you are experiencing psychological distress. Questions or statements about the most common ailments have been formulated to achieve this. It would be best if you answered the questions individually and truthfully.


Please read and answer all questions carefully. Choose the answer that best describes your situation. **The questions refer exclusively to distress in the past two weeks.** If you experienced this distress before this period, please do not include it.


IN THE PAST TWO WEEKS...	0	1	2	3
1. Have you thought about the possibility of taking your life?	No	No more than before	More than before	Much more than before
2. Have you ever wished you were dead and away from it all?	No	No more than before	More than before	Much more than before
3. Do you feel like you can't expect anything from life?	No	No more than before	More than before	Much more than before
4. Have you ever thought that you are worthless?	No	No more than before	More than before	Much more than before
5. Have you felt that you usually do things, right?	Better than before	The same as before	Worse than before	Much worse than before
6. Have you been satisfied with the way you do things?	More than before	The same as before	Less than before	Much less than before
7. Do you feel unable to solve your problems?	No, not at all	No more than before	More than before	Much more than before
8. Have you felt able to make decisions?	More than before	The same as before	Less than before	Much less than before
9. Have you had a feeling of heaviness in your head or felt that your head was going to explode?	No	The same as before	More than before	Much more than before
10. Have you had headaches?	No	The same as before	More than before	Much more than before
11. Have you ever felt nervous and ready to explode?	No	No more than before	More than before	Much more than before
12. Have you noticed that sometimes you can't do anything because you are so nervous?	No	No more than before	More than before	Much more than before
13. Have you ever felt exhausted and too weak to do anything?	Less than before	The same as before	More than before	Much more than before
14. Have you had difficulty sleeping through the night without waking up until the next morning?	No	The same as before	More than before	Much more than before
15. Have you had difficulty falling or staying asleep?	No	The same as before	More than before	Much more than before
16. Have you had restless or uneasy nights?	No	The same as before	More than before	Much more than before
17. Do you wake up too early and find it impossible to go back to sleep?	No	The same as before	More than before	Much more than before
18. Have you noticed that the idea of taking your life is repeatedly on your mind?	No	The same as before	More than before	Much more than before


WEIGHING PERCEPTIONS: PSYCHOMETRIC PROPERTIES OF THE OBESITY PRECONCEPTION AND WEIGHT-RELATED PROBLEM SCALES FOR MEXICAN PREADOLESCENTS

EVALUANDO PERCEPCIONES: PROPIEDADES PSICOMÉTRICAS DE LAS ESCALAS DE PRECONCEPCIONES SOBRE LA OBESIDAD Y PROBLEMAS RELACIONADOS CON EL PESO EN PREADOLESCENTES MEXICANOS


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RESUMEN

La obesidad infantil es un problema de salud pública global, y México registra tasas particularmente altas. Este estudio buscó desarrollar y proveer evidencias psicométricas para dos escalas: Una que evalúa preconcepciones sobre la obesidad, y la otra, problemas asociados con el peso en preadolescentes mexicanos. Se utilizó una muestra no probabilística de 247 estudiantes de quinto y sexto grado de primaria con sobrepeso u obesidad de la Ciudad de México ($\bar{X}=10.40$, $D.E.=0.65$ años de edad, $\bar{X}=23.61$, $D.E.=3.11$ IMC). Tras análisis factoriales exploratorios y confirmatorios, ambas escalas mostraron evidencia de validez estructural. Las escalas y subescalas alcanzaron una consistencia interna moderada, así como validez concurrente al asociarse significativamente con la calidad de vida relacionada con la salud. Los resultados subrayan la importancia de abordar los aspectos físicos y psicológicos del sobrepeso y obesidad infantil. Las escalas de los problemas relacionados con el peso y las actitudes y preconcepciones hacia la obesidad son herramientas valiosas para futuras investigaciones y programas de intervención destinados a mejorar el bienestar de los niños con sobrepeso u obesidad en México.

Palabras clave: sobrepeso, obesidad, bienestar, psicometría, desarrollo infantil.

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