

Validation Of A Questionnaire On Health Knowledge And Habits Based On Physical Education And Sport

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Abstract:

Background:

Regularly performed health habits benefit the health of adolescents. The objective is to elaborate and validate an instrument that evaluates the level of knowledge about knowledge and health habits (healthy behaviors such as physical activity, active movement, and sleep time) and their values based on physical education and sport in adolescents, since they predict variables that are constitutive of physical and mental well-being.

Materials and Methods: This is an instrumental, descriptive and cross-sectional study of psychometric type and quantitative approach, it constitutes a validation of the Questionnaire of knowledge and health habits from physical education and sport CCHS-EFD. The final questionnaire had 20 questions with multiple choice (disagree, moderately disagree, neither agree nor disagree and moderately agree, agree) and only one answer.

Results: A total of 20 questionnaire items were proposed. Had a reliability (Cronbach's α) of 0.73. In the validity analyses performed (content and construct) the results were satisfactory. Construct validity was assessed by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Three dimensions physical activity, health, healthy habits were also identified with good reliability. No statistically significant differences were found for the ages of the participants; however, statistical disparities were found for some items of the questionnaire in relation to sex, level of knowledge. Regarding the level of knowledge.

Conclusion: The version of the questionnaire meets the criteria of internal consistency and content and construct validity. These results show that the proposed questionnaire with 20 items can be used as a tool to determine the level of knowledge and health habits based on physical education, sport, and physical activity.

Keywords: knowledge, physical activity, health, nutrition, rest, students, validation, questionnaire.

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I. Introduction

WHO defines healthy lifestyles as a "general way of life based on the interaction between living conditions in a broad sense and individual patterns of behavior determined by sociocultural factors and personal characteristics" (1).

To begin with, from psychology, habits are defined as patterns of behavior performed automatically in response to a situation in which the behavior has been performed repeatedly and consistently in the past (2). In this regard, many healthy goals are achieved only by the repetition of actions (e.g. weight maintenance or weight loss) (3). Thus, healthy behaviors such as healthy eating, physical activity, active travel, hygiene, rest, social interaction, psychological and emotional well-being often have a habitual performance component.

According to some models, knowledge of risk factors is not necessary to change behavior; however, knowledge alone is not sufficient to foster attitudinal change. It is necessary for societal leaders, especially national, municipal, and local leaders, to promote the importance of physical activity (AP) for the health and well-being of all, including adolescents (4).

An active lifestyle during adolescence has many health benefits, such as improving cardiorespiratory and muscular capacity, improving bone and cardiometabolic health, and having positive effects on weight. There is also increasing evidence that AP improves socialization and cognitive development. Based on current data, many of these benefits are maintained into adulthood (5)

Global trends indicate that 81% of adolescents do not meet WHO global recommendations for AP (6), highlighting the need for urgent action to increase AP levels among adolescents aged 10-19 years.

The use of consistent tools that assess knowledge of healthy lifestyle habits can improve the assessment of people's health (7). Specific knowledge measurement tools are crucial because they can help people identify individuals who specifically need intervention for sedentary lifestyles. Educators have recognized the need for these tests and have created tools to assess knowledge about diseases such as hypertension, diabetes, sedentary lifestyle, high cholesterol, stroke, and metabolic syndrome.

II. Material And Methods

Sample

A total of 249 students from different public institutions in the city of Ibagué, between 14 and 18 years of age, participated. A simple randomized probabilistic method without replacement and stratified by school level was used to select the sample, with a confidence level of 99 percent and a margin of error of 5 percent. In addition, factors related to healthy habits were considered, such as physical activity, health, sleep time, food and rest, and finally, factors related to physical and mental well-being.

Methods and instrument.

The research was of minimal risk, according to the categories stipulated by Resolution 8430 of 1993 of the Colombian Ministry of Health (7). All data were collected and used anonymously following the ethical standards of the 2008 Helsinki declaration of the World Medical Association. Additionally, before answering the CCHS-EFD questionnaire, they read and signed the informed consent form. All participants were selected in the municipality of Ibagué-Tolima. It is an instrumental, descriptive and cross-sectional psychometric study. The questionnaire (CCHS-EFD) was developed and validated. This was applied to determine the knowledge that adolescents have about health habits based on physical education and sports. The properties of construct validity and reliability were analyzed; it is made up of 20 items that were subscribed in three dimensions (PA, health and healthy habits) (2). To consider these dimensions, a review of the literature was carried out and various contributions were taken into account (3–6), the design of the instrument or the preparation of the questionnaire, the sending of the questionnaire to a multidisciplinary group of experts, made up of professionals from different fields of AF. The group moderator was a PA and sports science professional, who led the discussions, which were written by an observer (researcher). Thus, this questionnaire aimed to generate questions that were analyzed by eight professionals with experience in physical education, PA and sports sciences. Each question and alternative were analyzed according to whether the item was: essential, useful but not essential and not necessary, following these categories designed by Lawshe (8), to be used by experts in the evaluation of the content of each item for the validation of the questionnaire (validity and reliability). Then, a first analysis of its internal consistency was carried out by applying it to a pilot group made up of 30 students. No linguistic comprehension problems were detected in any of the items presented by the participants in the pilot. From these phases, it is specified that the validation by the experts and the content validity for all the proposed items (CVR'0.92) showed an optimal reliability value (Cronbach's Alpha: 0.73), and an acceptable weighting was obtained (2). Construct validity was evaluated through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) and data processing and statistical analysis.

Statistical analysis

The data were processed with the statistical program IBM SPSS version 26. First, a descriptive analysis of the demographic factors was carried out and the normality of the data was analyzed using the Kolmogorov-Smirnov test. The construct validity analysis was carried out using the Exploratory Factor Analysis (EFA) technique, it was carried out after checking the adequacy of the sample based on the analysis of Bartlett's sphericity statistic, the significance of which is lower. at 0.05 and the Kaiser-Meier-Olkin (KMO) sampling adequacy statistic. (7). To verify the relevance of the data to be analyzed by this technique, the extraction of the factors was carried out with the principal components factorization method and to facilitate the identification of the factors, a Varimax rotation was carried out given that the theoretical model assumes a factorial of dimensions independent of each other. The internal consistency of the instrument was analyzed using Cronbach's alpha, which was calculated both in the total scale and in its dimensions, to have the reliability of the instrument (2.7–9).

For factor analysis, the multivariate structural equation method (SEM-PLS), a statistical analysis technique, was used. This method allows us to analyze complex patterns of relationships between variables, make comparisons between and within groups, and validate theoretical and empirical models. SmartPLS and the SPSS 2.6 statistical package were used, which was created to test structural models (Ringle et al., 2016).

III. Result

The analysis of the suitability of the data to be analyzed using the EFA was satisfactory, and a determinant of the correlation matrix close to zero (0.0000009) was obtained. For its part, the Kaiser-Meyer-Olkin (KMO: 0.848) and Bartlett's sphericity tests (X^2 : 1203.057; df: 190; $p < 0.0001$) denoted the relevance of the data. Strictly speaking, the analysis indicated that six factors had an eigenvalue greater than one and that, together, they explained more than 59% of the variance. The analysis of the factor matrix denoted the representation of all items with a significant loading, however, the parameter estimates – factor loadings and coefficients – are used to calculate the confidence intervals; In addition, this procedure provides the standard errors. Specifically, for the population of this model (items 13, 14, 15), the consumption of fruits and vegetables, and hydration do not show a significant causal relationship with having healthy habits, figure 1 and 2. According to these results, the

representation was verified of the proposed dimensions (Ap, Health, healthy habits), and the representation of all the items (fig 2). Although there was correspondence with the theoretical model, finally, the general reliability of the instrument was optimal (Cronbach's Alpha: 0.73), while optimal/acceptable values were obtained for the dimensions.

To verify the relevance of the data to obtain construct validity, the Kaiser-Meyer-Olkin (KMO) and Bartlett tests (9) were performed. Using the SPSS version 26 program, the KMO adequacy measure was obtained, which for values close to 1-, indicates the relevance of performing the factor analysis of the data; The same occurs with the Bartlett Sphericity Test, whose significance is less than 0.05 (Castello and Osborne, 2005; Pérez and Medrano, 2010; Juárez-Hernández, 2018; cited in Martínez-Corona et al., 2020) See Table 1

Tabla 1. Prueba de KMO y Bartlett

Prueba de KMO y Bartlett		
Medida Kaiser-Meyer-Olkin de adecuación de muestreo		,848
Prueba de esfericidad de Bartlett	Aprox. Chi-cuadrado	1203,057
	gl	190
	Sig.	,000

A structural model of knowledge of physical activity was built. The data set consists of standardized scalar variables between 1 and 5; Each of these variables makes up the predictor constructs, which are: Health, Healthy Habits and Physical Activity (Figure 1,2). The objective of the modeling is to infer the knowledge acquired in the physical education subject during compulsory education in relation to physical activity and health habits.

Figure 1.

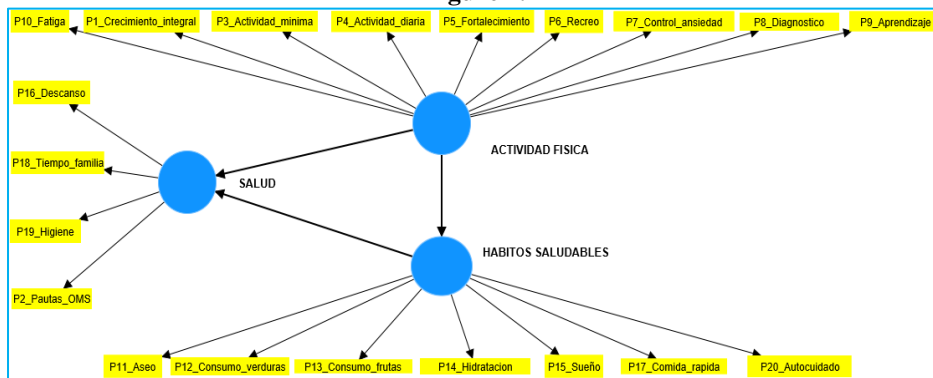
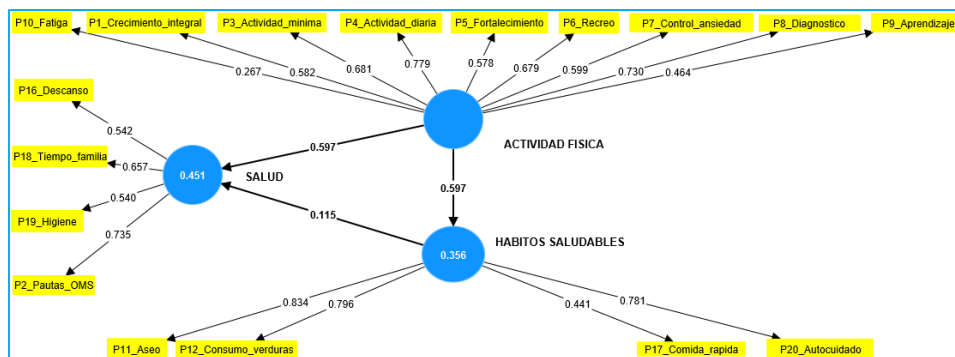


Figure 2



IV. Discussion

The initial analysis of validity and content of the CCH-EFD instrument (2) made it possible to ensure that the dimensions and items that make up it are relevant, pertinent and representative of the construct to be evaluated; it is required to demonstrate that it has construct validity, which is considered as main analysis, because it represents a comprehensive evaluative judgment of the degree to which empirical evidence and theoretical foundations support the suitability and adequacy of inferences and actions based on test results (10).

The dimensions used in this study corroborate the theoretical construct of the factors physical activity, health, healthy habits towards AP and sport, where the multidimensionality of the dimension is presented through

general and special knowledge of the dimensions (Deci & Ryan, 1985; Weinberg, Tenenbaum, McKenzie, Jackson, Ashel, Grove & Fogarty, 2000), these are determined voluntarily or not by people. (8).

It is necessary to mention that the sample used in the present study (n=249) presents specific characteristics, all students of basic secondary and vocational secondary school (homogeneous sample), with which the results are more coherent, compared to the samples of the studies of (9)

Validity and reliability are the main characteristics of a measurement (10). According to (11), reliability refers to the fact that an object of study measured with the same instrument will always produce the same results, but it does not guarantee nor is it synonymous with accuracy. An instrument may be reliable, but not necessarily valid for a specific population, or, in the worst case, the instrument has been manipulated to obtain certain results.

The traditional definition of an instrument referred to tautology: it is valid if it measures what it claims to measure. However, (12) understands validity as a unified concept that assigns a high value to how and for what the results of a test are used and their consequences (for example, how a measurement instrument can affect the processes personnel selection, admission tests to educational centers, knowledge tests, etc.).

Furthermore, it should be taken into account that validity is not an intrinsic property of the instruments, but will depend on the objective of the measurement, the population and the context of application, so an instrument may be valid for a particular group, but not for others. It must be considered that the validation process is permanent and requires constant empirical verification, therefore, it cannot be conclusively stated that a test is valid, but rather that it presents an acceptable degree of validity for certain objectives and populations.

Consequently, validity refers to the question of whether an instrument is valid, there is the probability of obtaining the same results when using the same instrument, reliability is an empirical fact that focuses on the probability of obtaining the same results when using the same instrument. same instrument (10). "From this perspective, the psychometric validity of an instrument is only one part of the systematic and rigorous collection of empirical evidence, from different dimensions, that must be carried out when asking the question: how appropriate are the inferences generated from test scores?" It is important to take into account the possible ethical ramifications that the test results may have (13)

This work presents the design, development and validation of an instrument to measure the construct physical activity, health and healthy habits based on AP and sport (CCHS-EFD) in adolescents. This tool consists of an easy-to-use questionnaire, which includes a total of 20 items distributed into 3 factors. For its design and initial validation, the expert panel methodology was used, with 7 experts. Based on previous studies, this number is large enough to carry out a correct analysis and a deep perspective at the same time (14,15).

According to (16), in this type of validity, consensual judgments are used to determine whether the content of the items is appropriate or not, that is, whether the measuring instrument serves to measure the behavior it intends to measure. The experts made contributions of a quantitative and qualitative nature, an issue that allowed the instrument to be perfected. Within the quantitative aspects, the judges mostly indicated that the questions are correct, and that their degree of appropriateness, wording and scale is high, an issue that reflects the value of the Content Validity Index (17) the scores obtained range between 0.50 and 0.1 These results, together with the fact that there are items with mean values less than 7, suggest that the initial items of the instrument be modified. Some items were modified in terms of wording, as a result of the qualitative contributions of the judges, such as those indicated above in results.

The data presented show that the questionnaire (CCHS-EFD) is capable of differentiating between different levels of knowledge and health habits based on physical education and sports and has appropriate reliability (0.731) and validity values for the samples studied.

Several authors (18,19) consider that qualitative contributions are essential during the development-validation process of a questionnaire. Therefore, after expert judges validated the content, the final instrument was created and established, which was used to evaluate its psychometric characteristics in a representative sample of vocational secondary school students.

With respect to the psychometric properties of the questionnaire, the construct validity was calculated through latent construct modeling considering the 3 dimensions, reporting an average extracted variance for each of them greater than 50% and for the second order an average extracted variance. (AVE) of 69.5%, which proves to be satisfactory, consistent with what was found by (20) where they used an exploratory factor analysis and a total explained variance of 69.36%. The present SEMPLS technique provides greater precision in the results.

Regarding the psychometric properties of the questionnaire, the construct validity was calculated through an exploratory factor analysis, which confirms the structure of the instrument in 5 factors that explain almost 37.23% of the variance. In essence, the instrument presented a high explanatory power (52.16%), even the Eigen values are greater than 1 according to what is recommended by (19). Regarding the determination of reliability, with the main purpose of achieving greater precision and reproducibility of the instrument (21), Cronbach's Alpha was chosen as a statistic that reflects the degree to which They would dig the items that make up the questionnaire, becoming an indicator of internal consistency (19).

On the other hand, in general terms, it is usually required that the Cronbach's Alpha value exceeds the coefficient of 0.6, so the obtained value of 0.731 can be considered correct. Furthermore, this coefficient is directly related to the saturations of the factors, which makes its use and application viable within the validity and reliability process in Survey-type studies. Additionally, this value does not increase when eliminating any of the items from the questionnaire, and the item-questionnaire correlation is, in all cases, greater than 0.5. Next and with respect to the specific literature of the construct (CCHS-EFD), it can be stated that the factors worked on allow measuring the main dimensions of knowledge of physical activity, healthy habits and health knowledge of the specific and general content, which are the most relevant issues of this investigative field according to:(22–26).

To carry out the analysis of the psychometric properties of the developed instrument, we sought to obtain a sample that was as representative as possible. For this purpose, a selection of participants was carried out based on non-probabilistic sampling among the total number of secondary school and vocational secondary school students in the public secondary education centers of Tolima, obtaining a total of 249 students. The characteristics of the participants agree with those shown in previous studies carried out both in the coffee region and at the national level, where the percentage of basic education and secondary education students have low knowledge and practice of physical activity (27)

Consequently, new studies are needed that analyze the psychometric properties of this instrument in other populations, mainly at a national and international level. This is because the CCHS-EFD and the students' perception of it may be influenced by their initial training, an aspect directly linked to the study plans of the institutions where the students are trained, which in turn tend to show differences depending on the different regional and national contexts

V. Conclusion

In summary, the questionnaire is designed to evaluate adolescents' knowledge and health habits based on physical education and sports. It has developed a twenty-item questionnaire and a descriptive analysis of the 249 participants has been carried out. In this way, the results show a content validity of the instrument of 0.73, which indicates that it has acceptable psychometric properties to be used as an evaluation instrument. The tests carried out They have allowed us to identify the explanatory level of the factors and have allowed us to validate the different items.