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Research

Spanish cultural adaptation of the avoidance questionnaire for adolescents (AQA) in undergraduate nursing students

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ABSTRACT

Background: The need for a validated Spanish questionnaire for nursing students focusing on psychological inflexibility, problem-solving, and reflective thinking prompted the adaptation of the Avoidance Questionnaire for Adolescents (AQA).
Aim: To develop and culturally validate a Spanish version of the AQA for use with undergraduate nursing students.
Methodology: The AQA was culturally adapted and its psychometric properties evaluated through an online survey involving 350 first- and second-year nursing students from the University of Granada and the University of Malaga (Spain). To assess sensitivity to change, a seminar was conducted with 116 students.
Results: The highest-scoring factors were "Postponement/strengthening up" and "Mulling," indicating greater reflection on problems. In contrast, "Negative self-efficacy/insolvability" and "Neglecting" scored lowest, suggesting adequate problem-solving skills. An exploratory factor analysis showed a Cronbach's alpha of 0.766 and an intraclass correlation coefficient of 0.874, with a good fit in the confirmatory factor analysis.
Conclusions: The Spanish adaptation of the AQA demonstrated good internal consistency, reliability, and sensitivity to change. It is a suitable tool for educational activities in nursing students.

Introduction

Chronological Delimitations of Adolescence

According to common usage, adolescence typically refers to the period of life between the ages of 13 and 19. However, the World Health Organization (WHO) defines adolescence as the period between 10 and 19 years, and youth as spanning 15-24 years. Given the behavioral, cognitive, and emotional overlap between these stages—amplified by a society that promotes an earlier onset and prolonged experienced of youth—it is essential to reconsider which institutions should be responsible for the care of adolescents. This presents a challenge for preventive actions and interventions targeting both adolescence and youth (WHO, 1990).

The process of adolescence is difficult to define precisely. Nevertheless, many actions aimed at young people should be initiated earlier, given the evolving realities of youth. Chronologically, Horrocks (1984) identifies three stages in the progression of adolescence: early adolescence or preadolescence (ages 11-13), middle adolescence (ages 14-16), and late adolescence (ages 17-20). Similarly, Neistein (1991) and Brañas (1997), from a developmental perspective, divide adolescence into three phases: early adolescence (ages 10-14), middle adolescence (ages 15-17), and late adolescence (ages 18-21). They, along with Silber (1992) and numerous other authors, assert that while puberty begins with biological changes, it is the psychological and social factors that truly define the adolescent experience.

Concept of Avoidance

There are several definitions of avoidance, although a unified definition does not exist. These definitions address the reason, the goal, and the manner in which avoidance is carried out. The main goal of

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avoidance is to distance oneself from people or situations that cause discomfort, negativity, sadness, embarrassment, shame, frustration, or other negative feelings. Motives for distancing are also compared with approach motives as counterpoints (Elliot, 2006; Elliot et al., 2013).

Social problem-solving is strongly related to anxiety and depression. During the COVID-19 pandemic, the prevalence of these symptoms increased among adolescents from a range of 11.2-14.6% before the pandemic to 19.0-36.6% during the pandemic (Weng et al., 2012). Problem solving plays a crucial role in psychological adjustment and in coping with problems to alleviate the psychological distress they generate (Lazarus & Folkman, 2021). Effective problem management reduces the morbidity associated with anxiety and depression by modifying health behaviours and lifestyles, with a special emphasis on emotion management and well-being as key factors. Conversely, poor management of healthy lifestyles is directly related to health problems such as anxiety and depression, which in turn result in deficiencies in problem-avoidance resources and thus fewer effective solutions (Thoma et al., 2015).

For effective problem management, it is essential to develop cognitive-behavioral processes that identify the problem in question and initiate coping mechanisms towards everyday problems. This orientation toward coping fosters motivation and a positive outlook, utilizing cognitive and behavioral resources for problem-solving (Folkman & Moskowitz, 2023). Kant et al. (1997) found that all five problem-solving dimensions measured by the Social Problem-Solving Inventory-Revised (SPSI-R) were significantly related to both anxiety and depression in at least one of two samples (middle-aged and older adults) (Kant et al.,1997). Further analyses indicated that negative problem orientation contributed the most to the significant mediating effect between problems and depression (Nezu et al., 2017).

In addition, it is important to consider the baseline circumstances of each individual, such as age and life context. For example, studying a pediatric population with a tumor or cancer diagnosis is not the same as studying a group of adolescents with eating disorders. This highlights the importance of training adolescents and the ability to reinforce their self-esteem in the classroom. It is also crucial to assess this training using validated questionnaires that provide evidence-based outcomes throughout the process (Prefit, Cândea, & Szentagotai-Tătar, 2019).

There are numerous questionnaires that assess psychological inflexibility and its negative impact on psychological health. These validated Spanish-language questionnaires demonstrate how emotional instability and externalizing and internalizing problems, associated with psychological inflexibility, affect life satisfaction, considering personality dimensions as well as emotional and behavioral problems (Ruiz & Luciano, 2021; Dominguez et al., 2020).

The SPSI-R scale, as previously mentioned, includes a short version with 25 items and a long version with 52 items. It is one of the most prominent instruments for studying social problem-solving. The SPSI-R, based on problem-solving process theory, assesses five dimensions: positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style, and avoidance style. This instrument has repeatedly been found to be reliable and valid for assessing a person's perception of their general approach to problem-solving styles in everyday life (Ruan et al., 2022).

A study in Hungary with 543 high school and 277 university students investigated the possibility of establishing homogeneous profiles based on social problem-solving factors (positive and negative orientation, rationality, impulsivity and avoidance). It also explored differences in self-efficacy between these groups. Three homogeneous groups were identified (optimistic-apprehensive, optimistic-reflective, and resigned-procrastinator), as well as four additional groups among adolescents (resigned-distancing, insecure-reflective, insecure-apprehensive, and resigned-melancholic) and three among young adults (optimistic-modest, tense-apprehensive, and tense-reflective). Relationships between social problem-solving factors and self-efficacy differed across profiles (Álvarez & Chávez, 2019).

In nursing, problem identification and problem-solving, together with reflective and critical thinking, are crucial and routinely used in many tasks within the profession.

Objectives

The aim of this study was to obtain an adapted and culturally validated Spanish version of the Avoidance Questionnaire for Adolescents (AQA) in undergraduate nursing students.

Methods

This project focused on the cultural adaptation of the AQA and the evaluation of its psychometric properties in nursing students. Data were collected through an online survey administered to undergraduate students.

Setting and Sample: The study was carried out in two Spanish universities, specifically in the Faculty of Health Sciences at the University of Granada, Melilla campus, and the Faculty of Health Sciences at the University of Malaga, in first- and second-year students enrolled in the Nursing Degree. A total of 350 students were invited to participate voluntarily and anonymously, excluding those without Spanish level C proficiency or over 21 years of age. For the analysis of sensitivity to change, a seminar was held with 116 students, applying the questionnaire before and after the seminar.

The AQA measures different forms of avoidance in problem-solving, with a shortened version of 23 items using a scale from 0 to 4: 0 "not true for me at all", 1 "somewhat true for me", 2 "moderately true for me", 3 "very true for me", and 4 "absolutely true for me". The questionnaire, created and validated by Kasik et al. (2018), assesses 11 factors related to problem solving: negative thoughts, feelings, physical symptoms, negative self-efficacy/insolvency, avoidance, neglect, expectancy/diversion, reflection, procrastination/strengthening, stopping/subordination, external pressure, and asking for help. The completion time is approximately 5-10 minutes. Sociodemographic data were also collected from the participants: age, gender, and nationality.

Cultural Adaptation of the Questionnaire in Nursing Students: The adaptation was carried out following the guidelines of the International Society for Pharmacoeconomics and Outcomes Research and the Patient-Reported Outcomes Measurement Information System (Wild et al., 2009; Wild et al., 2005; Cha et al., 2007). The process began with a review and definition of the concepts in the original questionnaire, followed by the initial translation by two native Spanish-speaking researchers with C1-level English. The two translations were compared, and a final version was created through a reconciliation process. Subsequently, a back-translation was carried out by a native English speaker without access to the original questionnaire to assess the fidelity of the translation. The back-translation was compared with the original questionnaire to verify equivalence between the two versions.

An expert review (four nurses and two undergraduate nursing lecturers) ensured that the translated questionnaire was equivalent to the original. The final questionnaire was administered to 14 nursing students, and a cognitive interview was conducted to identify possible difficulties in understanding the items, and improvements were made to the questionnaire.

Data Collection

Data collection was conducted between April and June 2023, with the permission of the two Faculties of Health Sciences and the

approval of the Ethics Committee. The information was provided to undergraduate nursing students by email, including a contact address for any queries.

To assess the reliability of the AQA, a baseline survey and a 7-day follow-up survey were required. Two links were included in the information mailing, one for the first questionnaire and one for the second, to be carried out one week later. To ensure anonymity, students were asked to identify themselves with a 5-digit alphanumeric code of their choice in both the first and second questionnaires, which was necessary for statistical evaluation.

To evaluate sensitivity to change, participation in a two-hour training seminar was proposed, and the questionnaire was administered to participants before and after the seminar.

Ethical Issues and Permissions

The project was approved by the Ethical Committee of Experimentation of the University of Malaga (CEUMA) on 27 February 2023, with the registration number CEUMA: 17-2023-H. Participation in the study was voluntary and anonymous, and students had to give their consent to participate.

Data Analysis

Frequencies or measures of central tendency and standard deviation were presented for the socio-demographic variables. The fit of quantitative variables to the normal distribution was checked using the Kolmogorov-Smirnov test. Preliminary analyses were performed to assess structural validity, including Bartlett's test of sphericity, which assesses the correlation matrix between variables and determines whether data reduction is adequate ($p < 0.001$). The Kaiser-Meyer-Olkin (KMO) fit coefficient was also used, with values close to 1.0 indicating the usefulness of a factor analysis, and values below 0.50 being considered not useful (Kaiser, 1974; Polit & Beck, 2016).

The internal consistency of the AQA was determined by Cronbach's alpha, with values between 0.70 and 0.90 suggesting good internal consistency (Cortina, 1993). Reliability was analyzed by means of a test-retest carried out by the same students participating in the study, with an interval of one week between the two tests. Reliability was assessed by means of the intraclass correlation coefficient, considering a minimum acceptable value of 0.75 (Shieh, 2016).

A confirmatory factor analysis was performed using the statistical programme JASP 0.16.4, following the theoretical model of the authors (D'Zurilla et al., 2002; D'Zurilla et al., 2004). There are six sections with 11 factors: 1. Negative thoughts, feelings and physical symptoms (Factor 1); 2. Negative self-efficacy/insolvability (Factor 2); 3. Ignoring the problem and procrastination (Factors 5 and 7); 4. Overriding, stopping/subordination and prevention (Factors 3, 4, and 9); 5. Reflecting, asking for help and procrastination with rethinking (Factors 8, 11, and 6); 6. External pressure (Factor 10).

The sensitivity to change of the factor scores was analyzed by calculating the mean difference in AQA between the score obtained in the first response to the questionnaire and the score obtained after the training seminar, using a Student's t-test for paired data.

The adequacy of the model fit was verified by several fit indices (Schreiber et al., 2006). The root mean square error of approximation (RMSEA) is a measure of absolute fit that assesses the difference between the model and the data according to the complexity of the model, with RMSEA results between 0.05 and 0.08 being acceptable, with a 90% confidence interval with a lower limit <0.05 and an upper limit <0.10 (Hu & Bentler, 1999). The standardized root mean square (RMSR) indicates the standardized difference between the sample correlations and the correlations estimated by the model, considering a good fit with values <0.08 (Hu & Bentler, 1999). The chi-square test, although statistically significant in large samples (Hooper & Coughlan, 2008; Raniti et al., 2018), is not used to assess model fit.

The comparative fit index (CFI) indicates a good fit with a value >0.95 (Hu & Bentler, 1999). The Tucker-Lewis index (TLI) also assesses incremental fit, with very good values ≥ 0.95, and acceptable values ≥ 0.90 (Tucker & Lewis, 1973). The goodness of fit index (GFI) calculates the proportion of variance explained by the estimated population covariance, recommending a general cut-off point of 0.90, and preferably ≥ 0.95 (Shevlin & Miles, 1998). Analyses were performed with the statistical packages SPSS 22.0 and JASP 0.16.4.

Results

Sample Characteristics

A total of 350 students were contacted for the study, 209 students participated and took the test-retest, the response rate was 59.71%. Sociodemographic characteristics of the participants: 164 (78.5%) females, 45 (21.5%) males; mean age 18.98 (0.87) years; nationality: Spanish 202 (96.7%), 2 Croatian, 2 Irish, 1 Italian, and 2 with dual Spanish-Italian nationality.

For the analysis of sensitivity to change, six seminars were held, with 116 students being assessed before and after the seminar.

Descriptive AQA Responses in Undergraduate Nursing Students

The factors with the highest scores were "Postponement/strengthening up" and "Mulling", which indicates a greater reflection on the existing problem in order to be able to solve it in an appropriate way. Those with lower scores were "Negative self-efficacy/insolvability" and "Neglecting", which indicates an adequate problem-solving ability by not ignoring problems and feeling capable of solving them. The data are presented in Table 1.

Structural Validity

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy showed an adequate result (0.822). Bartlett's Test of Sphericity also shows that the variables are not completely uncorrelated $\chi^2(45) = 1326.22$, $p < 0.001$. With these two results obtained, the sample meets the requirements for the Exploratory Factor Analysis.

Internal Consistency

Cronbach's alpha for the AQA factors was 0.766, being adequate as it is within the accepted values. This index does not improve in any case by eliminating any item from the questionnaire, so the

Table 1
Descriptors of the AQA Spanish version factors (n = 209)

Factors	M	SD
1. Negative thoughts, feelings, physical symptoms	0.54	0.72
2. Negative self-efficacy/insolvability	0.33	0.62
3. Prevention	1.32	0.82
4. Annulation	1.09	0.92
5. Neglecting	0.32	0.48
6. Expectation/diversion	0.80	0.82
7. Postponement/strengthening up	2.79	1.33
8. Mulling	2.46	0.77
9. Stopping/subordination	1.03	0.82
10. External pressure	1.02	0.91
11. Asking for help	0.68	0.76

The Avoidance Questionnaire for Adolescents (AQA): Range of scores: 0-4.

Table 2
Full statistics for each factor in the Spanish version of AQA

Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Negative thoughts, feelings, physical symptoms	11.84	22.79	0.61	0.73
2. Negative self-efficacy/insolvability	12.05	23.42	0.61	0.73
3. Prevention	11.06	23.88	0.36	0.75
4. Annulation	11.29	22.32	0.49	0.74
5. Neglecting	12.06	24.75	0.53	0.75
6. Expectation/diversion	11.58	22.17	0.60	0.73
7. Postponement/strengthening up	9.59	23.32	0.19	0.80
8. Mulling	9.92	23,65	0.26	0.77
9. Stopping/subordination	11.35	22.40	0.57	0.73
10. External pressure	11.36	23.75	0.33	0.76
11. Asking for help	11.70	23.34	0.49	0.74

conclusion is that all items should be included in the analysis of the data. The data in relation to the 11 factors are presented in Table 2.

Reliability Analysis

The intraclass correlation coefficient for the AQA total score showed a value of 0.874, with 95% confidence interval of (0.835-0.904), which reflects a good stability of the results.

Analysis of Sensitivity to Change

The questionnaire showed an ability to detect changes in the delivery of the training seminar, with a significant difference being found in six of the factors, so it can be concluded that it has a good sensitivity to change. The data are presented in Table 3.

Confirmatory Factor Analysis

The results of the confirmatory factor analysis were analyzed considering a theoretical model in which the total score of the scale is related to the six subscales, and each subscale in relation to its component factors. The results of the RMSEA index are 0.09, 90% confidence interval RMSEA 0.04-0.15; these two results are close to acceptable, and the rest of the results present a very good fit: CFI = 0.96, TLI = 0.91, RMSR = 0.05, GFI = 0.97. These data are presented in Table 4 and Fig. 1.

Discussion

In this study, the AQA was validated in undergraduate nursing students aged 18-21 years. When reviewing the mean scores obtained in the 11 factors of the questionnaire, it was observed that the highest scores given by the students were found in the postponement/strengthening and mulling factors. Postponement may be positive for problem solving, as it allows more time for adequate solving, according to research reporting that postponement increases with age during adolescence (D'Zurilla et al., 2002; Kasik, 2014; Dalgleish, 2004). Mulling is also associated with a positive state of resolution (Kasik et al., 2018). In general, all other factors are rated low, indicating good involvement in problem solving.

The internal consistency of the AQA was adequate, with a Cronbach's alpha of 0.766. When evaluated item by item across the 11 factors, the Cronbach's alpha results were similar to the total, indicating that the elimination of any item would not significantly improve internal consistency. These results were adequate in the validation study by Kasik et al. (2018), although Cronbach's alpha exceeded 0.8, possibly due to differences in the age of the participants, as it was validated in late adolescence (Kasik et al., 2018).

The reliability of the AQA, assessed by a test-retest one week apart using the intraclass correlation coefficient, showed good stability, indicating adequate reliability of the language-adapted questionnaire relative to the original model (Kasik et al., 2018). The sensitivity to change analysis, conducted by assessing the learners' opinion before and after the seminar, showed that the AQA has a very good sensitivity. The results of the confirmatory factor analysis indicated an adequate fit of our data to the original AQA model (Kasik et al., 2018).

There are other questionnaires suitable for assessing social problem-solving skills, such as the SPSI-R (D'Zurilla et al., 2002), the SPSI-A (Frauenknecht & Black, 2010), the MEAQ (Gamez et al., 2011), and the ACBS (Ubinger et al., 2013). However, the AQA allows for a multidimensional assessment of most forms of avoidance and social problem-solving and is applicable to different ages of adolescence.

The cultural adaptation and the results obtained in the validation of the AQA in Spanish indicate that it is valid for use in undergraduate

Table 3
Analysis of sensitivity to change

Factor	Before n = 116	After n = 116	Diference	*P*
1. Negative thoughts, feelings, physical symptoms	0.45 (0.67)	1.07 (0.64)	0.62 (0.60)	<0.001
2. Negative self-efficacy/insolvability	0.29 (0.56)	0.84 (0.72)	0.55 (0.81)	<0.001
3. Prevention	1.23 (0.83)	1.30 (0.74)	0.07 (1.00)	0.431
4. Annulation	1.06 (0.90)	0.10 (0.21)	-0.95 (0.84)	<0.001
5. Neglecting	0.28 (0.48)	0.21 (0.30)	-0.08 (0.49)	0.092
6. Expectation/diversion	0.71 (0.80)	0.15 (0.28)	-0.56 (0.79)	<0.001
7. Postponement/strengthening up	2.54 (1.05)	3.05 (0.70)	0.22 (1.57)	0.135
8. Mulling	0.96 (0.77)	0.56 (0.70)	-1.98 (1.18)	<0.001
9. Stopping/subordination	0.63 (0.69)	0.17 (0.29)	-0.79 (0.79)	<0.001
10. External pressure	2.83 (1.33)	0.89 (0.79)	-0.07 (0.79)	0.346
11. Asking for help	0.96 (0.89)	0.75 (0.80)	0.13 (0.84)	0.100

Table 4
Statistics of fit to confirmatory analysis

Metric	Value
RMSEA	0.09
RMSEA 90% CI lower bound	0.04
RMSEA 90% CI upper bound	0.15
RMSEA p-value	0.06
RMSR	0.05
CFI	0.96
GFI	0.97
TLI	0.91

RMSEA = Root mean square error of approximation; SMSR = Standardized root mean square residual; CFI = Comparative fit index; GFI = Goodness of fit index; TLI = Tucker-Lewis index.

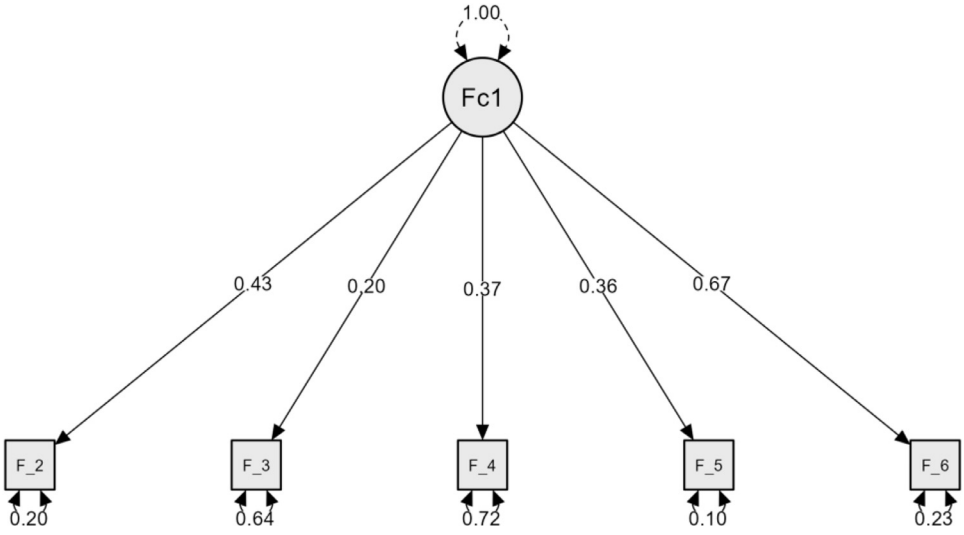

Fig. 1. Confirmatory factor analysis.

nursing students, confirming that it is a valid and reliable questionnaire, although it has some limitations that are discussed below. In this study, the AQA was validated in a sample of undergraduate nursing students, confirming its validity and reliability for evaluating avoidance and problem-solving strategies in this group of young adults. The results yielded important findings, highlighting certain coping and avoidance patterns in this age group.

In terms of descriptive scores, the factors that received the highest scores were "postponement/strengthening up" and "mulling". These results suggest that students tend to use strategies that involve delaying problem resolution or intensely reflecting on difficulties before addressing them. This type of postponement can be considered positive when it provides additional time for a more thorough analysis of the problem, which could lead to a more effective solution. This finding is consistent with previous research that points out that postponement tends to increase during adolescence, as cognitive skills mature and the ability to make complex decisions sharpens (D'Zurilla et al., 2002; Kasik, 2014; Dalgleish, 2004). Additionally, the high score in mulling, a factor related to reflection, reinforces the idea that young adults, especially in highly demanding careers like Nursing, may benefit from a more contemplative and deliberate approach to problem-solving (Kasik et al., 2018).

On the other hand, the factors that obtained the lowest scores were "Negative self-efficacy/insolvability" and "Neglecting", indicating a positive tendency to avoid inaction when facing problems and not feeling overwhelmed by a perception of personal incapacity. This suggests that the participants in this study possess a relatively high sense of personal efficacy when facing difficulties, which is crucial in the context of their professional training. These results are in line with studies that emphasize that health science students tend to develop active coping skills due to the nature of their academic training, which requires constant decision-making and problem-solving (He et al., 2018).

From the perspective of the factorial structure of the AQA, both Bartlett's Test of Sphericity and the KMO Measure indicated that the data were suitable for factor analysis.

These results are consistent with previous studies that validated the multidimensional structure of the AQA, demonstrating that this instrument is useful for evaluating different facets of avoidance and problem-solving (Kasik et al., 2018). Confirmatory factor analysis further confirmed the validity of the theoretical model in our sample, with generally satisfactory fit indices, such as the CFI (0.96) and TLI (0.91), supporting the applicability of the AQA in young adults in high-demand educational contexts.

As for internal consistency, a Cronbach's alpha of 0.766 indicates adequate reliability for the AQA in this sample. Although the value obtained is slightly lower than that of previous studies (Kasik et al., 2018), which reported an alpha above 0.8, the differences could be due to variations in the age and cultural context of the participants. The results suggest that the AQA is consistent in measuring the different factors, and it would not be advisable to remove items from the questionnaire, as it would not significantly improve its reliability. This level of internal consistency is adequate for psychological research in educational contexts, as similar studies on problem-solving questionnaires have noted (D'Zurilla et al., 2002).

Test-retest reliability, with an intraclass correlation coefficient of 0.874, supports the stability of the AQA over time. This is crucial since one of the main advantages of this type of instrument is the ability to reliably measure coping and avoidance strategies across different time points, allowing for continuous assessment in contexts of change, such as academic or professional training (Kasik et al., 2018). Furthermore, the sensitivity-to-change analysis confirmed that the AQA is capable of detecting significant changes in coping strategies after educational intervention (seminars), which is an important finding for its use in training contexts.

These results have important implications for the use of the AQA in nursing education, where the ability to effectively solve problems is an essential skill. Educational seminars could play a key role in strengthening positive coping strategies, and the AQA's ability to measure these improvements underscores its usefulness in the continuous assessment of training.

Regarding comparisons with other similar questionnaires, such as the SPSI-R (D'Zurilla et al., 2002), the MEAQ (Gamez et al., 2011), or the ACBS (Ubinger et al., 2013), the AQA stands out for its multidimensional approach to avoidance and problem-solving. This makes it a versatile tool, especially suitable for application in groups of adolescents and young adults in various contexts, such as educational and clinical settings.

In summary, the results of this study provide strong evidence that the AQA is a valid and reliable instrument for measuring avoidance and problem-solving strategies in nursing students. However, future research should explore its applicability in other cultural contexts and populations, as well as further examine its ability to detect changes over time in different educational settings.

Limitations

It was not possible to assess the AQA in other adolescent age groups, which can be considered a limitation of the study. However, the profile of the participants corresponds to that of the majority of Health Science Faculties in our environment. The sample was mainly composed of women, which could lead to variations in mostly male groups. The response rate, close to 60%, is good for an anonymous response to a questionnaire, and we do not believe that there are significant differences with nonrespondents.

Conclusion

In addition to specific training in nursing, it is important to address the problems that arise in the work activity and to work in an interdisciplinary team. The Spanish version of the AQA can be useful in identifying forms of avoidance and how problems are addressed. In this study, a cultural adaptation and psychometric validation of the AQA into Spanish was carried out in late adolescent undergraduate nursing students, finding good internal consistency, reliability, sensitivity to change, and a good fit in the confirmatory factor analysis, so it can be used in educational activity.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Cristina Casals: Writing – review & editing, Validation, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Eloísa Fernández-Ordoñez:** Writing – review & editing, Writing – original draft, Supervision, Software, Methodology, Funding acquisition, Conceptualization. **María Ángeles Vázquez-Sánchez:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Cristina Guerra-Marmolejo:** Writing – review & editing, Visualization, Resources, Investigation, Data curation. **María Angustias Sánchez-Ojeda:** Writing – review & editing, Visualization, Validation, Resources, Project administration, Investigation, Formal analysis, Data curation. **Inmaculada López-Leiva:** Writing – review & editing, Visualization, Resources, Formal analysis. **Marina García-Gámez:** Writing – review & editing, Writing – original draft, Supervision, Software, Methodology, Funding acquisition, Conceptualization.

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