

## Psychometric properties of a short form of the Adolescent Stress Questionnaire (ASQ-14)

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### Abstract

**Background:** Exposure to minor stressors is related to a range of emotional and behavioral problems in adolescents. The purpose of this study was to develop a screening instrument for assessing adolescent stressors. **Method:** The Adolescent Stress Questionnaire (ASQ-14) was tested on a sample of 561 adolescents aged between 12 and 18. We report validity evidence based on its internal structure (confirmatory factor analysis) and on relationships between ASQ-14 scores and other variables (correlational analysis), as well as an estimation of score reliability and differences by sex and stage of adolescence. **Results:** CFA indicated a one-factor structure with a total score representing a measure of cumulative minor stressors. This structure showed an adequate fit across all age groups (early, middle, and late adolescence). Values of internal consistency (.85) and test-retest reliability (.81) were also satisfactory. Validity evidence based on relationships with other variables showed positive relations with stress manifestations, anxiety, depression, and emotional and behavioral problems, and a negative association with life satisfaction. Finally, girls scored higher than boys, and stress scores increased across stages of adolescence. **Conclusions:** These results support the psychometric adequacy of the ASQ-14 and its use as a time-efficient tool in educational, clinical, and research studies.

**Keywords:** Adolescence, stressors, assessment, screening.

### Resumen

**Propiedades psicométricas de la versión abreviada del Cuestionario de estrés para adolescentes (ASQ-14).** **Antecedentes:** la exposición a estresores menores en la adolescencia se vincula a diversos problemas emocionales y conductuales. El propósito del estudio fue desarrollar un instrumento de screening para evaluar los estresores en adolescentes. **Método:** se presentan evidencias de validez basadas en la estructura interna mediante AFC, estimación de la fiabilidad, evidencias de validez basadas en las relaciones con otras variables mediante correlaciones y diferencias por sexo y etapa de la adolescencia del Cuestionario de Estrés para Adolescentes (ASQ-14) en una muestra de 561 adolescentes de 12 a 18 años. **Resultados:** el AFC detectó una estructura unifactorial que ofrece una puntuación total de estresores. Esta estructura también se ajustó en la adolescencia temprana, media y tardía. Los valores de consistencia interna (.85) y fiabilidad test-retest (.81) fueron satisfactorios. Las evidencias de validez basadas en la relación con otras variables mostraron relaciones positivas con manifestaciones de estrés, ansiedad, depresión y problemas emocionales y de comportamiento, y una asociación negativa con satisfacción vital. Finalmente, las chicas presentaron mayor puntuación en estrés y este aumentó según la etapa de adolescencia. **Conclusiones:** estos resultados apoyan las propiedades psicométricas del ASQ-14 y su uso como una herramienta eficiente en estudios educativos, clínicos y de investigación.

**Palabras clave:** adolescencia, estresores, evaluación, screening.

Adolescence is characterized by the presence of numerous stressors associated with cognitive, emotional, social, behavioral, and pubertal hormonal changes (Byrne, Davenport, & Mazanov, 2007). Adolescents are frequently exposed to cumulative and simultaneous stressors in various spheres, including their home situation, the educational environment, tension between educational obligations and the need for leisure time, romantic relationships, and interactions with the peer group (Anderson, Salk, & Hyde, 2015; Persike & Seiffge-Krenke, 2016; Wright, Creed, & Zimmer-Gembeck, 2010). As they grow older they also

experience stressors linked to concerns about the future, about financial issues, and the challenges associated with the transition from adolescent dependency to adult autonomy (Cairano, Menna, Molinar, & Sestito, 2009; Seiffge-Krenke et al., 2010). Empirical evidence also suggests that stressors are more prevalent among girls than boys (Byrne et al., 2007; Moksnes, Moljord, Espnes, & Byrne, 2010; Sotardi & Watson, 2018).

Although stressors are part and parcel of adolescence (Moksnes, Eilertsen, & Lazarewicz, 2016), there is evidence that exposure to heterogeneous and cumulative stressors is related to a range of problems in young people (Byrne et al., 2007; Moksnes, Espnes, & Haugan, 2014; Wright et al., 2010). For example, stressors have been linked to physiological symptoms, interpersonal difficulties, and emotional problems (Escobar, Blanca, Fernández-Baena, & Trianes, 2011; Fimian, Fastenau, Tashner, & Cross, 1989; Lima et al., 2017). More specifically, the experience of stressors in adolescence has been positively related to both anxiety (Moksnes

et al., 2014; Moksnes, Moljord et al., 2010) and depression (Charbonneau, Mezulis, & Hyde, 2009; Moksnes, Eilertsen et al., 2016; Moksnes, Løhre, Lillefjell, Byrne, & Haugan, 2016), and a positive association has also been observed between stressors and externalizing symptoms such as aggression or rule-breaking behavior (Elgar, Arlett, & Groves, 2003; Estévez, Jiménez, & Moreno, 2018; Suldo, Shaunessy, Thalji, Michalowski, & Shaffer, 2009). Other studies have found that those adolescents who report experiencing more stressors also report lower levels of life satisfaction (Bendayan, Blanca, Fernández-Baena, Escobar, & Trianes, 2013; Lima et al., 2017; Moksnes, Løhre et al., 2016). Although it is not possible on the basis of these findings to infer unidirectional causality, the consistency of results across many studies points to a deleterious effect of adolescent stressors on both the health and well-being of adolescents.

Given the important impact that stress can have on adolescents' health and well-being, it is important to be able to assess it. To this end, Byrne et al. (2007) developed the Adolescent Stress Questionnaire (ASQ), a 56-item instrument for measuring adolescent stressors (in order to avoid confusion, this long version and its translations will hereinafter be referred to as the ASQ-56). Principal components analysis of the ASQ-56 suggested a structure involving 10 factors: Home Life, School Performance, School Attendance, Romantic Relationships, Peer Pressure, Teacher Interaction, Future Uncertainty, School/Leisure Conflict, Financial Pressure, and Emerging Adult Responsibility. Scores on these factors showed adequate internal consistency (range .62 to .92) and test-retest reliability (range .68 to .88). Byrne et al. (2007) also found a positive relationship between factor scores and both anxiety and depression, and a negative association with self-esteem.

In a study involving adolescents aged between 12 and 17 years from several European cities, De Vriendt et al. (2011) found, using confirmatory factor analysis (CFA), an acceptable fit for the original 10-factor structure of the ASQ-56, and also added a second-order factor which supported the use of a total score for the questionnaire. The internal consistency for factors ranged from .57 to .88, and test-retest reliability over a 2-week interval was between .45 and .84.

Recently, Lima et al. (2017) administered a Spanish version of the ASQ-56 to students aged between 12 and 18 years. The factor structure they obtained via CFA replicated that found by De Vriendt et al. (2011). Internal consistency was adequate for most factor scores, with values above .70 on 9 of the 10 factors, and test-retest reliability over a 4-week interval was satisfactory. Validity evidence was established via positive associations with measures of stress manifestations, anxiety, and depression, and a negative association with a global measure of life satisfaction.

A crucial feature of the ASQ-56 is that it reliably captures the construct of adolescent stress, since its various factors reflect the key domains in which stressors may be present. The factor scores therefore provide clinical and educational professionals with important information which they may use to develop targeted interventions for adolescents. However, the length of the ASQ-56 means that it takes 15-20 minutes to complete, making it less suitable for screening adolescent stressors in large samples.

The development of a new shorter measure that retains adequate psychometric properties but with a smaller number of items could be useful in research, clinical, and educational settings. In the research context a short form of the ASQ would facilitate data collection from large samples, enable assessments to be carried out relatively quickly, reduce the burden on respondents (thus increasing

the likelihood that they will complete it), and allow for repeated measurements in order to track change over time. A short form may also make it easier to analyze the relationship between stress and other associated variables, thus contributing to the development of new theoretical models. In clinical and educational settings a short form of the ASQ could be used as a screening instrument to detect adolescents with high levels of stress, thus helping to identify a risk profile of potential emotional difficulties. Such a measure might also be employed as an assessment tool in combination with other measures of social and emotional aspects in adolescents, or to provide comprehensive data about a large number of cases, which could then be used to make decisions concerning clinical and school-based prevention and intervention programs.

A shortened version of the ASQ was recently developed and evaluated in a sample of Swedish early and middle (age 12-16) adolescents (Anniko, Boersma, van Wijk, Byrne, & Tillfors, 2018). The instrument includes 27 of the all items in the original ASQ, covering nine of its ten scales; items from the 'Stress of emerging adult responsibility' scale were omitted. Despite the potential utility of this new instrument, there is currently no short version of the ASQ with items covering all ten scales and which has been validated in a sample including older adolescents. The purpose of the present study was therefore to develop and validate a short form of the ASQ-56 that could be used to assess minor stressors across all three stages of adolescence (early, middle, and late: 12-18 years). Although we sought to include at least one item from each of the ten ASQ scales, our aim was also to produce an instrument short enough to be used as a screening tool. To this end, we developed a version consisting of 14 items (ASQ-14), based on the results obtained by Lima et al. (2017) with the ASQ-56, and examined its psychometric properties, focusing specifically on validity evidence based on its internal structure, measurement invariance across age groups, item analysis, estimation of score reliability, validity evidence based on relationships with other variables (Muñiz & Fonseca-Pedrero, 2019), and differences according to sex and stage of adolescence. We hypothesized a one-factor model in which the total score provides a measure of cumulative minor stressors and tested it using CFA. Evidence of validity based on the relationship with other variables was provided via analysis of correlations between ASQ-14 scores and measures of stress manifestations, anxiety, depression, emotional and behavioral problems, and life satisfaction.

## Methods

### *Participants*

The participants in this study were 561 students (271 males and 290 females) aged between 12 and 18 years ( $M = 15.05$ ,  $SD = 1.79$ ). The sample as a whole covered all four years of compulsory secondary education and the two years of baccalaureate studies in Spain. All participants came from families with a medium socio-economic status. A sub-sample of 177 of these students was considered for the analysis of test-retest reliability.

### *Measures*

*Adolescent Stress Questionnaire (ASQ-14)*. The ASQ-14 is a self-report questionnaire designed as a brief screening tool for assessing minor stressors in adolescents. Each of its 14 items is

rated on a five-point Likert scale (1 = not at all stressful, 2 = a little stressful, 3 = moderately stressful, 4 = quite stressful, and 5 = very stressful). The items were selected from the longer version of the Adolescent Stress Questionnaire (ASQ-56; Byrne et al., 2007), in this case, in its Spanish adaptation (Lima et al., 2017). A detailed summary of item selection is included in the data analysis section.

*Student Stress Inventory-Stress Manifestations scale (SSI-SM).* The SSI-SM (Fimian et al., 1989) was adapted into Spanish by Escobar et al. (2011). It assesses stress manifestations with 22 self-report items that are rated on a five-point Likert scale (1 = no strength, not noticeable; 5 = major strength, extremely noticeable). Factor analysis revealed a structure involving three first-order factors, namely Emotional Manifestations, Physiological Manifestations, and Behavioral Manifestations, and one second-order factor representing the total score for stress manifestations (Escobar et al., 2011). The internal consistency coefficients in the present sample were .89, .64, and .62 for scores on Emotional Manifestations, Physiological Manifestations, and Behavioral Manifestations, respectively, and .89 for the total score.

*State-Trait Anxiety Inventory (STAI).* The STAI (Spielberger, Gorsuch, & Lushene, 1970, 2008), which was adapted into Spanish by Guillén-Riquelme and Buela-Casal (2011), comprises two independent self-report scales that measure state anxiety and trait anxiety. Each scale has 20 self-report items that are rated on a 4-point Likert scale (0 = not at all; 3 = very much so). The internal consistency for these scales was .89 and .87, respectively.

*Reynolds Adolescent Depression Scale (RADS).* The RADS (Reynolds, 1987, 2002), adapted into Spanish by Figueras-Masip, Amador-Campos, and Peró-Cebollero (2008), assesses the current level of depressive symptomatology in adolescents. The RADS has 30 self-report items that are rated on a 4-point Likert scale (1 = almost never; 4 = most of the time). For the present study we considered the subscales of Somatic Complaints, Negative Self-Evaluation, and Dysphoric Mood. The internal consistency coefficients for scores on these scales were .71, .84, and .81, respectively.

*The Youth Self-Report (YSR).* The YSR (Achenbach & Rescorla, 2001) is a 112-item self-report questionnaire that is widely used to assess emotional and behavioral problems among adolescents. Respondents indicate on a 3-point Likert scale the degree to which a feeling or behavior is true for them (0 = not true; 2 = very true or often true). The YSR provides scores for two broadband scales — Internalizing problems (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) and Externalizing problems (Rule-breaking Behavior and Aggressive Behavior) — and for Total Problems. The present study considered the broadband and total problem scales. The internal consistency for these scales was .88, .87, and .88, respectively.

*The Satisfaction with Life Scale (SWLS).* The SWLS (Diener, Emmons, Larsen, & Griffin, 1985), adapted into Spanish by Atienza, Pons, Balaguer, and García-Merita (2000), offers a global measure of life satisfaction. The Spanish version, for which new empirical evidence of validity has been reported (Bendayan et al., 2013), consists of five self-report items that are rated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). In the present study the internal consistency was .79.

### Procedure

The study procedures were carried out in accordance with the Declaration of Helsinki, and the study protocol was approved

by the Experimentation Ethics Committee of the University of Malaga. Adolescents and parents were required to sign an informed consent form. Test-retest reliability was measured over a period of 4 weeks in order to ensure no memory effect in the second administration. School classes for this analysis were selected randomly.

### Data analysis

The CFA carried out by Lima et al. (2017) with the ASQ-56 formed the basis for the selection of items to be included in the short version. The structure of the ASQ-56 comprises 10 factors: Home Life, School Performance, School Attendance, Romantic Relationships, Peer Pressure, Teacher Interaction, Future Uncertainty, School/Leisure Conflict, Financial Pressure, and Emerging Adult Responsibility. In order to select items for the short version we selected two items for each factor with seven or more corresponding items, and one item for each factor with fewer than seven corresponding items. The selection for each factor was made by ranking the respective items based on their factor loadings and choosing those with the highest loadings. We then examined the correlations between each item and the criterion measures used to obtain validity evidence based on relationships between ASQ-56 scores and other variables, prioritizing those items with higher correlations. Additionally, and in order to capture the complex construct of adolescent stressors, any conceptually similar items were eliminated. This process resulted in a set of 14 items with adequate psychometric properties, constituting the ASQ-14. These items are shown in Table 2.

The internal structure of the ASQ-14 was examined by means of CFA. We tested a one-factor model in which each of the 14 items loaded on one latent factor. Based on criteria used by the World Health Organization (2014) we divided the sample into the following three age groups: early (10-13 years), middle (14-16 years), and late (17-19 years) adolescence. We then tested the configural and metric invariance for the one-factor model across these three age groups. Thus, the model was tested by constraining the factor structure to be equal across age groups and by constraining the factor loadings to be equal.

For the CFA we used structural equation modeling and the EQS 6.3 software package (Bentler, 2006). Analyses were performed on the polychoric correlation matrix, using the maximum likelihood and robust estimation methods. We computed the Satorra-Bentler chi-square ( $\chi^2_{S,B}$ ) and the following goodness-of-fit indices: the comparative fit index (CFI), the non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). The cut-off points for a good fit were values of the CFI and NNFI close to .95 (Hu & Bentler, 1999). Values of the RMSEA less than .08 were considered to indicate a reasonable fit (Browne & Cudeck, 1993) and those less than .06 as evidence of a good fit (Hu & Bentler, 1999). Finally, we assessed the configural and metric invariance by comparing the CFI values of the models. The equal constraints were considered to be tenable if the decrease in CFI in the most constrained model was less than or equal to .01 in relation to the configural model (Cheung & Rensvold, 2002).

The ASQ-14 score was calculated by summing scores for all 14 items. In order to analyze the item properties we computed the corrected item-total correlations, with the score of the respective items eliminated. We considered values greater than .30 as satisfactory (De Vaus, 2002). Estimation of score reliability

was provided by computing Cronbach's alpha coefficients and examining test-retest reliability, with values greater than .70 being considered acceptable (Shultz & Whitney, 2005).

In order to obtain validity evidence based on relationships with other variables, we computed Pearson correlation coefficients between ASQ-14 scores and scores for stress manifestations, anxiety, depression, emotional and behavioral problems, and life satisfaction. In line with Cohen's criterion (1988), correlation coefficients close to |.30| and close to |.50| were considered as moderate and large, respectively.

Finally, we performed a two-way analysis of variance (ANOVA) to assess differences in ASQ-14 scores according to sex and stage of adolescence (early, middle, and late).

Results

Evidence based on the internal structure

We conducted a CFA with the total sample to test the fit of the one-factor structure. The models showed a good fit, with CFI and NNFI values above .95 and the RMSEA close to .06. We then calculated the fit of the same model for groups corresponding to each stage of adolescence (early, middle and late). The three models showed adequate fit values. The goodness-of-fit indices related to the test for multigroup configural invariance and the equality of the factor loadings also suggested a good fit. The decrement in the CFI from the configural model to the model with the factor loadings constrained to be equal across stages of adolescence did not exceed .01. Table 1 shows the fit indices for the total sample and for the factor invariance. Estimations for the standardized parameters of the model with the total sample are shown in Table 2; all values are statistically significant.

Item-total correlation and estimation of score reliability

It can be seen in Table 2 that all the corrected item-total correlations were above .30. The Cronbach's alpha coefficient for total scores was .85, and the test-retest correlation was .81; both values are acceptable as they are above .70.

Validity evidence based on relationships with other variables

Pearson correlations between the ASQ-14 and the other measures considered are shown in Table 3. ASQ-14 scores were positively related to scores on stress manifestations, anxiety, depression, and

emotional and behavioral problems, and negatively related to life satisfaction. All correlations were above |.30|, except in the case of behavioral manifestations, where the coefficient was |.29|.

Differences according to sex and stage of adolescence

The results of the two-way ANOVA showed statistically significant main effects for sex,  $F(1, 555) = 12.16, \eta^2_{partial} = .02, p < .01$ , with girls scoring higher on the ASQ-14 ( $M = 38.01$ ) than boys ( $M = 34.65$ ), and stage of adolescence,  $F(2, 555) = 8.14, \eta^2_{partial} = .03, p < .001$ , with a linear increase in ASQ-14 scores across stages from early ( $M = 33.51$ ), to middle ( $M = 36.82$ ), to late ( $M = 38.67$ ) adolescence,  $F = 3.65, p < .001$ . The interaction between these two factors was not statistically significant,  $F(2, 555) = 2.14, \eta^2_{partial} = .008, p = .12$ . Descriptive statistics are shown in Table 4.

Discussion

The purpose of this study was to develop and validate a short version of the ASQ-56 in order to provide a tool for screening adolescents' minor stressors. To this end we developed the ASQ-14, a 14-item version based on the results obtained by Lima et al. (2017) with the ASQ-56. The examination of its psychometric properties focused on validity evidence based on internal structure, measurement invariance across age groups, item analysis, estimation of score reliability, validity evidence based on relationships with other variables, and differences according to sex and stage of adolescence.

Regarding validity evidence based on the internal structure, the results of the CFA with the ASQ-14 revealed a good fit of the hypothesized one-factor structure to the observed data. The highest factor loadings corresponded to the items "Lack of understanding by your parents" and "Arguments at home". These results are consistent with those reported for the ASQ-56, which highlight the family as a central issue for adolescent development (American Psychological Association, 2002; Steinberg, 2001). This one-factor structure supports the use of a total score representing the cumulative stressors experienced by adolescents across several domains. It is also consistent with the use of a total score for the ASQ-56, as proposed by De Vriendt et al. (2011) and Lima et al. (2017). The results from the analysis of configural and metric invariance suggested that both the structure and the factor loadings were equivalent across age groups. This provides support for the stability of the structure underlying the ASQ-14 and offers further evidence of its internal structure.

Table 1  
Fit indices for the one-factor model of the ASQ-14

Model	$\chi^2_{s-b}$	df	CFI	NNFI	RMSEA	$\Delta$ CFI
Total sample	240.12	77	.964	.958	.062 [.053-.070]	
Early adolescence	106.53	77	.977	.972	.055 [.025-.078]	
Middle adolescence	174.85	77	.951	.942	.067 [.054-.080]	
Late adolescence	107.81	77	.975	.971	.053 [.026-.074]	
Configural invariance	391.11	231	.965	.958	.061 [.050-.071]	
Equality constraints on factor loadings	422.46	257	.963	.961	.059 [.048-.069]	0.002

Note:  $N = 561$ ; Early adolescence (12-13 years),  $n = 130$ ; Middle adolescence (14-16 years),  $n = 285$ ; Late adolescence (17-18 years),  $n = 146$ ;  $\chi^2_{s-b}$  = Satorra-Bentler chi-square; df = degrees of freedom; CFI = comparative fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation with 90% confidence interval;  $\Delta$  CFI = CFI configural invariance model - CFI constrained model

Table 2  
Means (M), standard deviations (SD), and standardized factor loadings for the one-factor model of the ASQ-14, and corrected item-total correlations

ASQ-56 items	ASQ-14 items	M	SD	Factor loading	Item-total correlation
Item 29. Arguments at home [Tener discusiones en tu casa]	1	2.76	1.36	.71	.61
Item 46. Lack of understanding by your parents [Sentir que tus padres no te comprenden]	2	2.64	1.44	.75	.63
Item 41. Pressure of study [Sentirte presionado por estudiar]	3	3.02	1.33	.58	.53
Item 12. Difficulty with some subjects [Tener dificultades con algunas asignaturas]	4	3.29	1.19	.52	.47
Item 31. Compulsory school attendance [Tener que asistir obligatoriamente a clase]	5	2.29	1.37	.37	.32
Item 38. Not having enough time for your boy/girlfriend [Tener poco tiempo para estar con tu novio/a]	6	2.34	1.50	.55	.45
Item 34. Dissatisfaction with how you look [Estar insatisfecho con tu aspecto]	7	2.09	1.35	.55	.46
Item 54. Disagreements between you and your peers [Tener desacuerdos con tus compañeros]	8	2.27	1.16	.53	.45
Item 43. Not being listened to by teachers [Que los profesores no te escuchen]	9	2.73	1.46	.59	.50
Item 17. Disagreements between you and your teachers [Tener desacuerdos con tus profesores]	10	2.56	1.29	.59	.51
Item 7. Concern about your future [Tener preocupaciones acerca de tu futuro]	11	2.93	1.36	.44	.40
Item 51. Lack of freedom [Tener poca libertad]	12	2.89	1.48	.70	.60
Item 36. Not enough money to buy the things you want [Tener poco dinero para comprar las cosas que quieres]	13	2.50	1.42	.57	.50
Item 11. Having to take on new family responsibilities with growing older [Tener que asumir nuevas responsabilidades familiares conforme te haces mayor]	14	2.33	1.17	.52	.46
Total score		36.63	10.98		

Note:  $N = 561$ . Items are reproduced from Byrne et al. (2007, pp. 402-403)

In relation to the estimation of score reliability, the internal consistency coefficient for the total score was .85, indicating satisfactory reliability. This value is slightly lower than the coefficient of .95 obtained by both De Vriendt et al. (2011) and Lima et al. (2017) with the ASQ-56, probably due to the smaller number of items. Test-retest reliability for the ASQ-14 was also satisfactory (.81) and similar to the values reported by the abovementioned authors (.89 and .84, respectively). Item analysis showed corrected item-total correlations above .30, which are therefore adequate.

As regards validity evidence based on relationships with other variables, our results are consistent with previous research. Specifically, we found that ASQ-14 scores were positively related to scores on stress manifestations (Lima et al., 2017), anxiety, depression and other internalizing problems (Byrne et al., 2007; Charbonneau et al., 2009; Lima et al., 2017; Moksnes, Eilertsen et al., 2016; Moksnes et al., 2014; Moksnes, Moljord et al., 2010), and behavioral or externalizing problems (Elgar et al., 2003; Estévez et al., 2018; Suldo et al., 2009). This is the first time that externalizing problems have been used as a measure to provide validity evidence for the ASQ, including with the longer version. In addition, we found a negative association between ASQ-14 scores and life satisfaction, which is a relevant indicator of mental

health and subjective well-being in adolescents (Bendayan et al., 2013; Lima et al., 2017; Moksnes, Løhre et al., 2016).

The relationship between ASQ-14 scores and manifestations of stress shows that stress as a stimulus is related to stress as a response. This means that a comprehensive account of stress and its impact on adolescents' mental health requires an integrative model which includes not only sources of stress but also their emotional, physiological, and behavioral manifestations (Escobar et al., 2011; Lima et al., 2017). As regards the negative relationship between ASQ-14 scores and life satisfaction and the positive association with several emotional and behavioral problems, our analysis indicates that adolescents with higher levels of minor stressors also reported a lower level of life satisfaction and a higher level of state and trait anxiety, somatic complaints, negative self-evaluation, dysphoric mood, and internalizing and externalizing problems. These results support an association between emotional maladjustment and the stress produced by the physiological, cognitive, emotional, and social changes that are experienced in adolescence. In this respect, our findings are consistent with the stress exposure hypothesis, which proposes that exposure to stressful circumstances or events is associated with emotional health problems in children and adolescents (Cole, Nolen-Hoeksema, Girgus, & Paul, 2006).

Table 3

Correlations of ASQ-14 scores with the measures of stress manifestations, anxiety, depression, emotional and behavioral problems, and life satisfaction

Variable	ASQ-14
Stress Manifestations	
Emotional Manifestations	.47
Physiological Manifestations	.35
Behavioral Manifestations	.29
Total Stress Manifestations	.47
Anxiety	
State Anxiety	.35
Trait Anxiety	.43
Depression	
Somatic Complaints	.47
Negative Self-Evaluation	.41
Dysphoric Mood	.48
Emotional and Behavioral Problems	
Internalizing Problems	.40
Externalizing Problems	.38
Total Problem Score	.48
Life Satisfaction	-.33

Note: All correlation coefficients were significant,  $p < .001$

Table 4

Mean ASQ-14 score (M) and standard deviation (SD) according to sex and stage of adolescence

Sex	Stage of adolescence	M	SD
Boys	Early	32.77	11.03
	Middle	35.66	9.70
	Late	35.53	9.32
Girls	Early	34.24	11.54
	Middle	37.98	11.30
	Late	41.80	11.36

Regarding sex differences, our finding of higher stressor scores among girls is consistent with previous research (Byrne et al., 2007; Moksnes, Moljord et al., 2010; Sotardi & Watson, 2018).

This difference may be related to the use of different coping styles by boys and girls, since studies suggest that girls are more likely to use non-adaptive coping strategies (e.g., ruminative response) (Hamilton, Stange, Abramson, & Alloy, 2015). Finally, the observed increase in stress scores with age shows that as adolescence progresses, young people experience new and multiple stressors and that these can have a cumulative effect (Moksnes, Byrne, Mazanov, & Espnes, 2010).

Overall, our findings underline the importance of implementing health promotion programs to help adolescents deal with minor stressors through enhanced coping, and of taking into account sex differences and the stage of adolescence. Programs of this kind should focus on adaptive coping skills such as problem solving, optimistic thinking, effective communication, decision-making, goal setting, time management, social support, and seeking professional help (Frydenberg & Brandon, 2007). It is worth noting in this respect that mindfulness-based stress reduction (MBSR) programs have recently been shown to be an effective tool for promoting health and reducing symptoms of perceived stress among adolescents (Díaz-González, Pérez, Sánchez-Raya, Moriana, & Sánchez, 2018).

The present study has both strengths and limitations. Its major strengths are that the psychometric properties of the ASQ-14 have been analyzed in a sample encompassing all stages of adolescence, and that several other measures of psychological adjustment were used to obtain validity evidence. As for the study's limitations, the use of a cross-sectional design means that it is not possible to infer the direction of causality between the variables. Relationships of causality should be examined in future studies.

In conclusion, the ASQ-14 is suitable for use in research on adolescent stressors and thus can help to strengthen knowledge of the experience of minor stressors during adolescence. As a screening instrument the ASQ-14 could be employed in large samples to identify adolescents who suffer high levels of stress. Those who score high on the ASQ-14 could be considered at risk and as targets for more detailed social and emotional assessment by a psychologist. Group assessment of this kind could help clinical and educational professionals to design intervention programs aimed at helping at-risk adolescents to manage and cope with stressors, or alternatively it might form part of a health prevention initiative in the normative population. In this context, the partial scores derived from the longer version of the ASQ would serve to identify the key domains in which stressors are present, thus facilitating the design of more targeted interventions.

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