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Psychometric Examination of the Freshman Stress Questionnaire Using a Sample of Social Work Students in Spain during the Covid-19 Pandemic

David González Casas[1], Ana Isabel Dorado Barbé [1], Esther Mercado García[1], Jose Pablo Calleja Jimenez[2] and José Luis Gálvez-Nieto [3,*]

[1]*Department of Social Work & Social Services, Faculty of Social Work, Complutense University of Madrid, Pozuelo de Alarcón, Madrid 28223, Spain*
[2]*Sociology Department, Oviedo University, Luis Moya Blanco, Cabueñes 33203, Gijón, Spain*
[3]*Department of Social Work, Universidad de La Frontera, Araucanía, Chile*

*Correspondence to José Luis Gálvez-Nieto, Department of Social Work, Universidad de La Frontera, Francisco Salazar Avenue 01145 Temuco Box 54, Araucanía, Chile.
E-mail: *jose.galvez@ufrontera.cl*

Abstract

The teaching–learning model implemented in Spanish universities as a result of the Covid-19 pandemic has generated a scenario of academic uncertainty amongst Spanish students. In the case of the Social Work degree, this apprehension appears to be linked to the heavy emotional load related to the theoretical–practical curricular contents of the degree. In this sense, the Freshman Stress Questionnaire (FSQ) has presented adequate levels of reliability and validity for its use on a population of Spanish university students; however, there is as yet no psychometric studies for its use on social work students. This study sought to analyse the psychometric properties of the FSQ using a sample of social work students. The sample comprised 732 students at three Spanish universities doing a social work degree (88.3 per cent women, 11.7 per cent men) with an average age of 21.51 years (standard deviation (SD) = 3.58). The results obtained from the exploratory factor analysis and confirmatory factor analysis revealed that the FSQ maintained the structure of four correlated factors and suitable reliability values for each dimension. The results of the factor invariance analysis indicate that the FSQ remains stable up to the level of metric invariance for the variable age. Results are discussed with available theory.

Keywords: academic stress; Freshman Stress Questionnaire; psychometrics; reliability; social work; validity

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Introduction

The term stress has become a dimension of study and analysis that has gained remarkable prominence in recent decades in all population groups (Reddy *et al.*, 2018); it is associated with depression (Bhatt *et al.*, 2020), anxiety (Thapa *et al.*, 2020) and behavioural issues (Bernhard *et al.*, 2021). Stress was defined as an alarm reaction to nonspecific signs and symptoms used in a stressful situation (Selye, 1956), which leads to the subject's inability to cope with a problematic situation (Pinel, 2007).

This construct is linked to both stimulating events and the sequence of processes triggered by exposure to stressors (Grant *et al.*, 2003), as with the relation and interaction between the subject and environmental conditions (Lazarus, 1984). Therefore, it is the set of environmental conditions, the response to an interaction between stressors and the person and/or the anxiety with respect to mood that can occur when an individual confronts a stressor (Moos and Swindle, 1990).

In the young population, this circumstance is decisive as they have grown up in a globalised, competitive and unequal world (Perruci, 2011; Docu, 2018) with the demands of a social milieu that tends to individualise social problems nature and establishes canons of success based on competitiveness as valid. It involves the appearance of high levels of isolation, anxiety, stress and depression (Kass, 2018).

When the reactions to the demands of the milieu are produced in the academic sphere, it frequently refers to the subject's mechanisms to cope with academic stress (Rull *et al.*, 2011). Academic stress results from the combination of academic demands and the individual's ability to cope (Wilks, 2008; Wilks and Spivey, 2010). For any educational institution it is vitally important to know the stress level of its students, since this is associated with physiological problems (Serlachius *et al.*, 2007; Melillo *et al.*, 2011), academic failure (Sideridis and Kafetsios, 2008) and a sub-par academic performance (Saklofske *et al.*, 2012).

Some studies have confirmed the existence of high levels of stress at all academic stages (Connor, 2003; Pascoe *et al.*, 2020), observing that the highest levels of academic stress are in university students (Dyson and Renk, 2006) due to the academic commitments, financial pressures and lack of time management and interpersonal skills (Misra *et al.*, 2000). In particular, social work students experience stress throughout their academic courses (Dziegielewski *et al.*, 2004). However, there is a

paucity of studies that have examined student stress using generic scales; most have focused on specific potential areas of stress for the students, with the most common being academic stress, the stress associated with social relationships and the stress produced by contextual issues (Boujut and Bruchon-Schweitzer, 2009).

University studies represent the peak of academic stress due to the combination of several factors, from the increased workload to profound changes in the life cycle (Beck *et al.*, 2003), which can influence psychological and physical well-being (Feldman *et al.*, 2008).

The previously mentioned factors have been compounded by the impact of the Covid-19 health crisis which, in addition to being a stressful event for the young population due to associated psychosocial conditioners (Rodríguez *et al.*, 2020), has signalled a profound shift in university teaching–learning models with in-person teaching that poses an emotional challenge for the university community (Kumalasari and Akmal, 2021; Bergantz and Curtis, 2022).

From the statement by the WHO on the pandemic (March 2020), almost all European states have implemented a variety of measures in education as containment mechanisms against the transmissibility of Covid-19. These changes range from the total suspension of in-person classes in the initial periods to partially in-person classes with smaller groups or going exclusively online. In their work as teachers and investigators in the field of social work, the researchers have observed how stress levels amongst students in the discipline have increased due to the public health crisis and the academic uncertainty that the adoption of new teaching–learning models has brought. The general feeling of social work students during the period mentioned has become a key factor in the interest and/or need to generate specific knowledge to evaluate academic stress at university relative to social work in Spain.

During this period, the effects of Covid-19 on the emotional state of university students have been analysed, uncovering its impact and the existing relation between the pandemic and the increased levels of emotional distress, anxiety and depression (Bao, 2020; Savage *et al.*, 2020; Basheti *et al.*, 2021; Simegn *et al.*, 2021) and the loss independence and privacy (Gómez-Ciriano, 2020).

This relation has been observed in the increase of academic stress in social work students (Yehudai *et al.*, 2022; Scheffert *et al.*, 2021), since stress is considered a transactional process between a new and stressful situation and personal and social resources (Boujut and Bruchon-Schweitzer, 2009). Yet, there are no studies analysing these dimensions in social work students in Spain during the pandemic. However, Díaz-Jiménez *et al.* (2020) have shown that the existence of factors of severe anxiety as a result of the state of emergency due to Covid-19 is conditioned by unstable income and the area of residence.

The psychosocial, health and educational reality of the Spanish context of the 2020–2021 course in social work studies at universities has forced all students, regardless of their academic year, to adapt to a novel and never before experienced reality and, as a result, this new academic scenario has meant that all students can be considered freshmen integrating into a new teaching–learning model.

The analysis and study of students adapting and coping with a global health emergency has been very difficult since to date the assessment tools adapted to the university scenario caused by the pandemic have not been available. In this sense, the Freshman Stress Questionnaire (FSQ), the object of the psychometric analysis in this study, was originally created in French and consists of four dimensions: (1) academic stress, defined as a physiological, cognitive emotional and behavioural reaction to academic stimuli and events (García and Zea, 2011); (2) university dysfunction, which refers to how the lectures are conducted, the abstraction of the contents, the university's lack of organisation and the attention of the Faculty; (3) feeling of loneliness, which includes any disagreeable experience that occurs when the system of personal and social relations is unsatisfactory (McIntyre *et al.*, 2018) and (4) relationship problems, referring to difficulties in relationships with relatives and friends (Boujut and Bruchon-Schweitzer, 2009). This questionnaire was subjected to an analysis of internal consistency and reliability, the indicators of reliability ranged between 0.71 and 0.82 (Boujut and Bruchon-Schweitzer, 2009).

Considering the available evidence and the relevance of measuring this construct in a population of Spanish social work students, this study considered two hypotheses (h): h1: the scores on the FSQ will maintain a structure of four correlated factors and suitable reliability levels, h2: the scores on the FSQ will be equivalent up to the level of scalar invariance according to age. Consequently, this study sought to analyse the psychometric properties of the FSQ in a sample of social work students.

Method

Participants

Participants were selected by nonprobability sampling and by availability. This procedure achieved the appropriate sample size to randomly divide the sample into two symmetrical halves, ensuring the stability of the population parameters. In addition, the sample fulfilled the requirements generally used in psychometric studies for a confirmatory factor analysis (CFA, Jöreskog, 1971), in addition to including at least ten cases per item (Nunnally, 1967) and a sample size equal to or greater than 100 participants (Myers *et al.*, 2011).

Three Spanish universities were invited to participate: the Complutense University of Madrid, University of Oviedo and the University of Jaén. The selection criteria were the following: universities that offer a social work course, geographic dispersion, centre, north and south of Spain, and implementation of education models differentiated for the Covid-19 pandemic. The instruments were administered during the first semester of 2020, and were applied to all the students taking the social work degree, under the assumption that the new teaching–learning models, implemented due to the Covid-19 pandemic, included all the students beginning with the new academic scenario. Finally, 732 social work students agreed to participate in this study (88.3 per cent women and 11.7 per cent men), with an average age equal to 21.51 (SD = 3.58), enrolled in: first year (30.2 per cent), second year (26.8 per cent), third year (24.2 per cent) and fourth year (18.9 per cent).

Instruments

A socio-demographic questionnaire of closed questions was applied: age, sex, year and university.

In addition, the Spanish version (García, 2011) of the FSQ (Boujut and Bruchon-Schweitzer, 2009) was applied. The FSQ is a self-report measure that assesses the perception of academic stress and is composed of seven items answered on an ordinal scale (1 = not at all, 5 = strongly). The FSQ has a structure of four dimensions called: Academic stress (six items, e.g. 'Fear of failing exams'), University dysfunction (four items, e.g. 'Lack of organisation by the Faculty'), Loneliness (four items, e.g. 'Not knowing anyone'), Problems with close relations (three items, e.g. "Conflicts with my partner"). This instrument has presented satisfactory evidence of reliability and validity in different samples (Boujut and Bruchon-Schweitzer, 2009; García, 2011; Décamps *et al.*, 2012).

Procedure

For access to the student sample, authorisation was sought from the Department of Social Work, the Dean's Office and the Office of the Vice-Dean of Students at the three participating universities. Once the ethics authorisations had been obtained, the questionnaire was distributed to all the students through the Office of the Vice-Dean of Students. Then, informed consents were applied to safeguard the principles of confidentiality and anonymity.

The measuring instruments were administered online. The use of the online survey model has numerous advantages in terms of the efficiency and effectiveness in the study of broad population samples. The online

survey reaches a large number of people in a short period of time, which reduces the research costs, and eliminates the possible human errors when compiling and transcribing the collected data (Lefever *et al.*, 2007). In this sense, the psychometric study of scales and questionnaires pinpoints a relevant number of responses to be able to obtain valid and reliable results. The aforementioned, added to the health situation present during the field work (asynchronous classes, small groups of students and social distancing), made the online survey model the best methodological solution to obtain the sample.

Analysis

The rate of missing values was less than 5 per cent of the sample and was treated using the multiple imputation method available in the MPLUS v.8.1 software (Muthén and Muthén, 2017). Then, descriptive measures, measures of central tendency, dispersion and form of each of the items on the questionnaire were obtained. Next, to give evidence of crossed validity, two random and independent samples of 366 students were created. An exploratory factor analysis (EFA) was performed on the first sample using the polychoric correlation matrix and the unweighted least squares (ULS) estimation method. An oblique rotation was implemented. These analyses were performed with FACTOR 10.8.03 (Lorenzo-Seva and Ferrando, 2006), and the item selection criteria were: saturations greater than or equal to 0.30 in the theoretically defined factor and absence of crossed saturations greater than 0.30 between the two factors.

A CFA was performed on the second sample with the MPLUS v.8.1 software (Muthén and Muthén, 2017). The polychoric correlation matrix was used and, in this case, the ULS with mean and variance adjusted (ULSMV; Muthén and Muthén, 2017) estimation method. In order to evaluate the quality of the model, the following goodness-of-fit indices were used: comparative fit index (CFI), Tucker–Lewis index (TLI) and root mean square error of approximation (RMSEA). For the indices, CFI and TLI were considered an acceptable fit of the model with values greater than 0.90 (Schumacker and Lomax, 1996), and to RMSEA values below 0.08 were considered a reasonable fit (Browne and Cudeck, 1993). In addition, a factorial invariance analysis was performed. This analysis considers the following models (Vandenberg and Lance, 2000): M0 configural (equal number of factors), M1 metric (equal factor loadings) and M2 scalar (equality of intercepts). The following coefficients were used to estimate reliability: McDonald's ω, greatest lower bound and Cronbach's α (Green and Yang, 2015; Trizano-Hermosilla *et al.*, 2021).

Results

Descriptive analyses

The descriptive analysis based on the mean of the items (Table 1), yielded a maximum mean of 4.18 (SD = 1.055) for item 9 'The lack of organisation by the Faculty' and a minimum mean equal to 2.24 (SD = 1.463) for the item 'Conflicts with my partner'. The analysis of the measures of form, skewness, shows that item 16 'Conflicts with my partner' had the highest value below the distribution mean (Skewness = 0.699; Kurtosis = −1.251).

Factor structure

To assess whether the proposal of four correlated factors was reasonable in the Spanish sample, an EFA was performed with the first sample in the study (Table 2). The Kaiser–Meyer–Olkin test = 0.820 and Bartlett's statistic = 2837.4 ($df = 136$; $p < 0.001$) supported the relevance of performing an EFA. The extraction analysis based on the eigenvalues maintained four factors greater than the unit, explaining 63.51 per cent of the variance of the data. The first factor called Problems with close relations explained 34.9 per cent and groups items 15, 16, 17; the second factor called Loneliness (11.58 per cent) grouped items 11, 12, 13, 14; the third factor called Academic stress (9.73 per cent) grouped items 1, 2, 3, 4, 5, 6; and finally, the fourth factor called University dysfunction (7.30 per cent) grouped items 7, 8, 9 and 10.

In addition, three alternative CFA models were estimated with the seventeen items on the scale. The first model evaluated was a one-factor. This model proved an unsatisfactory fit: ULSMV-χ^2 (119) = 799.707, $p <$ 0.001; CFI = 0.730; TLI = 0.691; RMSEA = 0.125 (90% CI 0.117–0.133). The second model submitted for approval included a structure of two correlated factors: the results again yielded unsatisfactory goodness-of-fit indices: *ULSMV*-χ^2 (118) = 575.624, $p < 0.001$; CFI = 0.818; TLI = 0.791; RMSEA = 0.103 (90% CI 0 .95–0.111). Finally, the estimation of a model of four correlated factors provided an acceptable fit *ULSMV*-χ^2 (113) = 307.400, $p < 0.001$; CFI = 0.923; TLI = 0 .907; RMSEA = 0.069 (90% CI 0.059–0.078). These results indicate that the model fits well to the data, so the structure obtained in the EFA is confirmed (Figure 1).

Factorial invariance

Once the factorial structure of the FSQ was obtained, a factorial analysis of invariance was performed for the variable age. The first model contrasted was the M0 configural; the results were satisfactory [*ULSMV* χ^2 (226) = 776.863, $p <$0.001; CFI = 0.924; TLI = 0.907;

Table 1. Descriptive statistics for the items ($n = 732$)

Item number	Items	Mean	Std. deviation	Skewness	Kurtosis
It1	Coping with exams	3.91	1.011	−0.664	−0.176
It2	The amount of work I have to do	3.95	0.935	−0.664	−0.071
It3	Fear of failing exams	4.12	1.135	−1.185	0.451
It4	I have to adapt to new ways of studying and working	3.59	1.093	−0.329	−0.709
It5	Having to learn to organise my own work/be independent	3.24	1.299	−0.171	−1.075
It6	Feeling I don't have the required academic level.	3.74	1.238	−0.669	−0.609
It7	The classes are monotonous	3.43	1.238	−0.253	−1.012
It8	The classes are not sufficiently clear or concrete	3.32	1.185	−0.131	−0.949
It9	Poor organisation by the faculty	4.18	1.055	−1.188	0.613
It10	The lack of attention by the lecturers	3.25	1.215	−0.124	−0.941
It11	Feeling alone	3.30	1.417	−0.238	−1.253
It12	Feeling anonymous in the Faculty	3.05	1.466	0.011	−1.399
It13	Not knowing anyone	2.58	1.382	0.394	−1.102
It14	The fact that my friends live far away	2.65	1.387	0.309	−1.158
It15	Relationship/emotional issues	3.57	1.279	−0.519	−0.820
It16	Conflicts with my partner	2.24	1.463	0.699	−1.030
It17	Arguments with relatives	2.95	1.378	−0.012	−1.251

RMSEA = 0.068] and it may be concluded that the factorial structure of the FSQ is the same according to age. Then, the M1 metric model was evaluated, which imposes restrictions on the factor loadings. The results indicate that there are no statistically significant differences between the metric and configuration models [$ULSMV\ \chi^2\ (239) = 797.459$, $p < 0.001$; CFI = 0.925; TLI = 0.907; RMSEA = 0.071; $\Delta\chi^2 = 19.746$; $\Delta df = 13$; $p\ (\Delta\ ULSMV\ \chi^2) = 0.1017$]; therefore, the factor loadings of the items on the scale are equivalent according to age. In addition, the degree of M2 scalar invariance was evaluated, including restrictions in the intercepts of the items, and the results indicate that there are no statistically significant differences between the metric and scalar models for the variable age [$ULSMV\ \chi^2\ (252) = 833.592$, $p < 0.001$; CFI = 0.922; TLI = 0.902; RMSEA = 0.078; $\Delta\chi^2 = 54.633$; $\Delta df = 26$; $p\ (\Delta\ ULSMV\ \chi^2) = 0.0008$]. Therefore, from these results, it may be concluded that there are differences between the intercepts of the items according to age.

Evidence of reliability

Table 3 provides the evidence of reliability for the scale considering the model of four correlated factors. The results indicate an acceptable

Table 2. Rotated loading matrix ($n = 366$)

Item	Problems with close relations	Loneliness	Academic stress	University dysfunctions
It1. Coping with exams			0.774	
It2. The amount of work I have to do			0.447	
It3. Fear of failing exams			0.725	
It4. I have to adapt to new ways of studying and working			0.533	
It5. Having to learn to organise my own work/be independent			0.414	
It6. Feeling I don't have the required academic level			0.530	
It7. The classes are monotonous				0.460
It8. The classes are not sufficiently clear or concrete				0.780
It9. Poor organisation by the Faculty				0.769
It10. The lack of attention by the lecturers				0.823
It11. Feeling alone		0.651		
It12. Feeling anonymous in the Faculty		0.891		
It13. Not knowing anyone		0.624		
It14. The fact that my friends live far away		0.407		
It15. Relationship/emotional issues	0.665			
It16. Conflicts with my partner	0.865			
It17. Arguments with relatives	0.839			

Factors loadings lower than absolute 0.300 omitted.

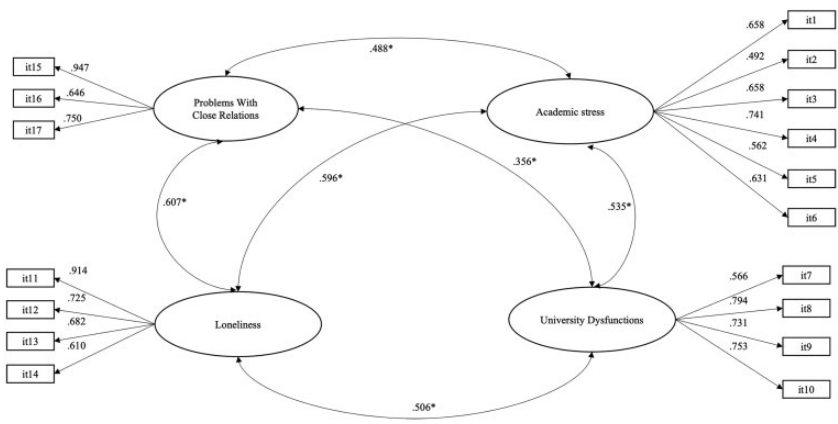

Figure 1: Model of four correlated factors ($n = 366$). All the estimated parameters were statistically significant ($p < 0.001$).

Table 3. Scale reliability statistics ($n = 732$)

Dimensions	McDonald's ω	Cronbach's α	Greatest lower bound
Academic stress	0.756	0.755	0.835
University dysfunction	0.765	0.757	0.802
Loneliness	0.779	0.776	0.826
Problems close relations	0.779	0.680	0.814

reliability for each factor. The factors Loneliness and Problems with Close Relations presented the highest reliability values on the scale.

Discussion

This study sought to analyse the psychometric properties of the FSQ in a sample of social work students. The results of this study support the first hypothesis, which posited that the FSQ scores maintain a structure of four correlated factors with suitable levels of reliability. The results obtained from the EFA and CFA support the original model based on four dimensions: academic stress, university dysfunction, loneliness and problems with close relations. In addition, the indicators of internal consistency for each dimension were satisfactory and are similar to those obtained in previous studies (Boujut and Bruchon-Schweitzer, 2009). These results offer psychometric evidence for the use of the questionnaire in the Spanish population for social work students.

The results obtained from the factorial invariance models partially support hypothesis 2, which posited that the scores on the FSQ appear equivalent up to the level of scalar invariance according to age. As per the results found in the sample, the FSQ remains stable until the level of metric invariance, regardless of the age of the study participants. In relation to these results, it is worth noting that the variable age is a relevant predictor for academic stress; for example, in the findings by Misra and McKean (2000), the older students have greater perceived control of their time, less anxiety, and use their free time for studying; hence, they present fewer physical and psychological reactions to academic stress. Age and developmental stage affect the way in which people deal with stress (Monteiro *et al.*, 2014). Stress is concomitant with student life and can have a significant impact on it, and even on academic work. Globally, three out of every five visits to the doctor are stress related (Edjah *et al.*, 2020).

The relation between academic stress and motivation are important predictors that influence stress and self-directed learning (Heo and Han, 2018; De Jong *et al.*, 2020). However, age is crucial in the perception of stress (Mahmood *et al.*, 2013; Edjah *et al.*, 2020). Freshmen undergo a greater degree of academic stress than students in other years (Singh

and Upadhyay, 2008; Jabeen *et al.*, 2013). More significant moderate values of stress are found in the adult young population (Edjah *et al.*, 2020), because they have more strategies for solving problems, cognitive restructuring, expressing emotions (Monteiro *et al.*, 2014).

The dimension 'academic stress', linked to performance indicators, in particular to the variables dealing with exams, evaluation, work overload, the fear of not having the academic level required and the fear of examinations being called off, are the ones that present the highest consistency levels, as confirmed in other studies (Allison *et al.*, 1997; Perry *et al.*, 2001; Pekrun *et al.*, 2002; Reddy *et al.*, 2018). Academic demand (workload and lack of time) is an indicator of academic stress (Rojas *et al.*, 2005). In the Spanish context, these results are consistent with those formulated by Díaz-Jiménez *et al.* (2020) in that worry about one's academic situation is a risk factor for stress, and is cushioned by support from one's family and partner (Collins *et al.*, 2010).

Similarly, the dimension 'university dysfunction' appeared as another specific factor of stress linked to the academic organisation of the Faculty. The principle of safeguarding public health materialised from the start of the pandemic as a transformation from in-person to online (Román, 2020). This has meant that in a brief space of time a new teaching–learning methodology model has had to be instituted and, consequently, it has negatively impacted students' perception about academic organisational and administrative management. These results are analogous to those demonstrated by Bojuwoye (2002) and Mason (2017), in that they confirm that the demands of the university environment and the administrative process have higher levels of association and consistency with respect to academic stress.

The dimension 'feelings of loneliness', composed of loneliness, anonymity, lack of closeness in coexistence and not knowing anyone, as in other studies (Diehl *et al.*, 2018; Hysing *et al.*, 2020), seems to be decisive in university students, with this connection being consistent with the connection with close relatives and friends that leads to emotional loneliness and the lack of a network of relationships being linked to social isolation and psychological consequences (Weiss, 1973; Oliveira Carvalho *et al.*, 2022).

Finally, the dimension 'problems with close relations' should not be considered a specific component of stress in university students, but rather a dimension of stress in young adults (Boujut and Bruchon-Schweitzer, 2009). The results of the present study have demonstrated how emotional and relationship issues are a greater burden when in conflict with a partner or relatives. Studies show that the social support of friends and a resilient personality have a more significant effect on academic stress (Wilks and Spivey, 2010; Khori and Urbayatun, 2019).

In addition to what was mentioned, previous pandemic-related studies highlight the differences found with respect to age group. It was

determined that people aged eighteen to twenty-five years had higher stress levels presented during the period mentioned (Horesh and Brown, 2020; Ozamiz *et al.*, 2020), noting how the pandemic has had a catalyst effect for the increase in stress levels in university students (Savage *et al.*, 2020; Bourion-Bédès *et al.*, 2021; Fawaz and Samaha, 2021; Von Keyserlingk *et al.*, 2022), with the change from in-person teaching to online media, partially in-person or online only being decisive (Osorio *et al.*, 2020; Xavier *et al.*, 2020).

Conclusions

The results of this study provide psychometric evidence of the FSQ as a reliable assessment scale suitable for evaluating the academic stress of students doing a degree in social work in Spanish universities in the new education scenarios caused by the global Covid-19 health crisis, or other scenarios that give rise to changes in the teaching methodology model.

It is worth pointing out that this questionnaire was validated for new university students, but due to the exceptional nature of the health measures for the Covid-19 pandemic, the aim of this study lay in demonstrating its reliability for students in general, since the new teaching–learning scenario implemented at universities for all the students, regardless of the academic year, has provided units of analyses analogous to the experience of freshmen on their arrival in the university education system.

Thus, the FSQ provides rigorous and effective units of analyses to be compared to other scales and different profiles of students in different university contexts.

In the present situation of uncertainty caused by the pandemic, having evaluation tools available that make possible the analysis and study of academic stress levels in students offers the academic and research community instruments to improve education policies in higher education and affect students' personal experiences of university, in the event of possible future health emergency situations.

The digital transformation of universities as a result of the Covid-19 pandemic goes beyond digitisation as the basis for change oriented to contents, operations and processes. Accordingly, comprehensive changes of the models and teaching educational interactions are required and for this, the evaluations of new didactic processes must begin, therefore, from the significant experience of the students themselves as protagonists of teaching–learning processes imparted by higher university education.

The conclusion in relation to the relevance of having validated instruments for assessing students in higher education during emergency health situations, in this case the FSQ, is to generate university learning

spaces that foster academic excellence and the development of research and university outreach.

In terms of the limitations of the study and also as future lines of enquiry, it would be interesting to perform validations in students of social work and different degrees, both in the Spanish context and worldwide. In addition, it would be appropriate to develop psychometric studies to analyse the behaviour of the questionnaire in students who attend lectures voluntarily in-person at universities with online teaching and/or vice versa. On the other hand, given the nonprobability sampling design, future studies should conduct comparative research between universities with probability samples, in addition to exploring how the different teaching–learning models implemented affect students' stress levels. However, the choice of sampling type in the present study responds to the objectives and methodological needs adjacent to a psychometric evaluation.

Finally, the use of the online questionnaire model can cause respondent bias. However, the written explanation in the online questionnaire (prior to its execution) referring to the opportunity to know students' stress levels may be considered a cushioning factor against the lack of motivation/reflection in the responses. The use of online participation channels responds to the need to reach a high number of people in different geographic places and with various teaching–learning models.

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