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RESEARCH ARTICLE

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Factors contributing to stress in clinical practices: A proposed structural equation model

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Abstract

Aim: To propose a predictive model of procedural and emotional stress in clinical placements while testing self-efficacy as a possible mediator factor.

Design: The study used an exploratory correlational design.

Method: A total of 334 nursing students completed the KEZKAK—stress in clinical practice, AG—general self-efficacy and CEA—academic overload questionnaires, along with one about leadership. Sociodemographic information was also included.

Results: Confirmatory factor analyses and internal consistency reliabilities were satisfactory in all questionnaires. Procedural stress and emotional stress were confirmed by KEZKAK [χ^2 (674) = 1,555.58, p = .001; χ^2/df = 2.308, CFI = .90, IFI = 91, RMSEA = .06]. The structural equation method for procedural stress and emotional stress had an acceptable fit. They revealed that academic level influenced the perception of leadership and academic overload in both procedural stress and emotional stress. General self-efficacy only mediated emotional stress. Hospital unit acted independently as a predictor of procedural stress.

KEYWORDS

clinical placement, leadership, nursing students, self-efficacy, stressors, structural equation models

1 | INTRODUCTION

It has been broadly acknowledged in the literature that nursing is a stressful profession, subject to different sources of stress (Bennett, 2002; Jones & Johnston, 2000; McVicar, 2003). Direct interaction between practitioner and patients and their families, resource and staffing shortages in times of recession, having to deal with death and disease on a daily basis and, in general, the fact of working in an ever-changing and highly demanding environment (Chang, Hancock, Johnson, Daly, & Jackson, 2005) have all led researchers to study stress in nurses.

Over recent decades, it has been observed that nursing students, like nursing professionals, also suffer from high levels of stress (Turner & McCarthy, 2016). Most of the studies conducted in this field have focused on the stressors present in the clinical placement activities carried out in hospitals, considering these to be the principal source of stress (Gibbons, 2010; Hegge & Larson, 2008).

However, according to some authors (Pryjmachuk & Richard, 2007; Sheu, Lin, & Hwang, 2002; Weitzel & McCahon, 2008), the main source of stress lies in academic issues, such as examinations, continuous assessment activities, fear of failing to pass on to the next year of

[Correction added on 18 November 2019, after first online publication: The first name of Andrea Izagirre Otaegi was previously incorrect and has been updated in this version.]

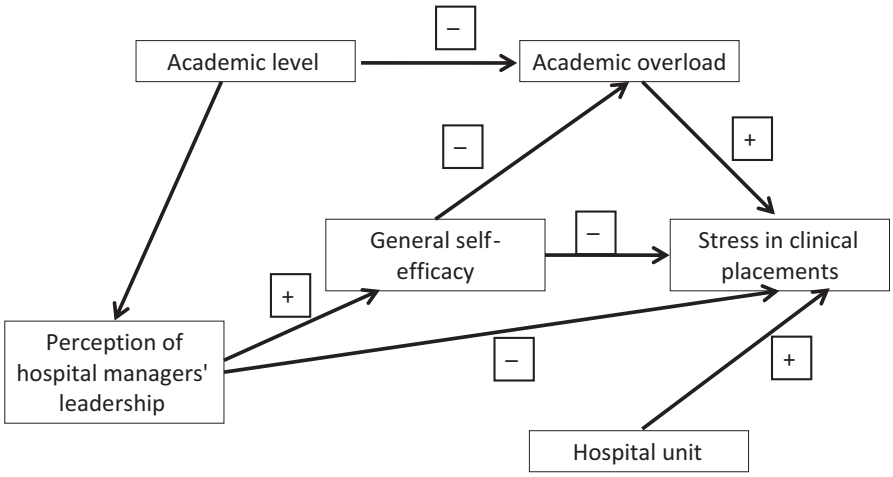

FIGURE 1 Theoretical model for predicting stress in clinical placements among nursing students

the course or losing one's sense of control over one's studies (Gibbons, Dempster, & Moutray, 2008). Other authors, such as Rhead (1995), argue that stressors stem from both academic activities and clinical placements and have serious health consequences for students.

Recent research (Sheridan, Carragher, Carragher, & Treacy, 2018) has focused specifically on stress among nursing students working with older adults, identifying the relationship between nursing student and supervisor as an important stressor. [Correction added on 18 November 2019, after first online publication: The preceding sentence has been changed for clarity.] Stress also is present among novice nurses (for 2 years after graduation), particularly when they perceive a low level of institutional support, when they experience the death of their first patient or when experiences with physicians are also predominantly negative (ten Hoeve, Kunne, Brouwer, & Roodbol, 2018).

2 | BACKGROUND

According to Muñoz (2004), overload is one of the most powerful academic stressors. Abouserie (1994) claims that the enormous volume of content they are expected to learn, studying for exams and work overload are the main causes of stress among university students in general. For their part, Spangler, Pekrun, Kramer, and Hoffman (2002) have observed that the examination period is a critical type of stressful situation for university students. In general, it is assumed that workload (scheduling and activities) and stress are directly related to insomnia among nursing students (Güneş & Arslantaş, 2017), which in turn gives rise to an unhealthy situation.

In addition to academic and practical aspects, some authors (Gibbons et al., 2008; Hegge & Larson, 2008) have also studied a series of personal factors as possible sources of stress among student nurses, including family issues, economic problems, coping with emotions, personality traits and interpersonal relationships.

In general terms, it is broadly recognized that problems with stress do not start when nurses finally begin their professional practice, but rather are present throughout their training and, moreover, have a direct influence on their academic performance and well-being (Brown, Anderson-Johnson, & McPherson, 2016; Rhead, 1995). As a result of this circumstance, the evolution of stress among nursing students has been studied from a longitudinal perspective.

Some authors have found that stress increases as students advance through their degree course (Lindop, 1991). Others (Edwards, Burnard, Bennett, & Hebden, 2010; Omigbodun et al., 2006) have observed that personal stress and the stress stemming from clinical activities decrease as students progress with their training, although clinical factors remain the greatest source of stress, both at the beginning and at the end of the nursing degree course (Zupiria et al., 2007). Nevertheless, no conclusive data have yet been presented about the reason why these stress levels change throughout the training period (Edwards et al., 2010).

One factor which does much to explain the evolution of stress levels among nursing students is self-efficacy. It was Gibbons (2010) who published the first study which analysed the mediator role played by self-efficacy and coping strategies as modulators of stress and burnout. Self-efficacy is understood as a person's belief in their ability to successfully cope with a task or situation (Bandura, 1997) and can be approached from two different perspectives. The first is that of general self-efficacy (Schwarzer & Jerusalem, 1995), understood as an individual's confidence in their own ability to cope, as manifested in a wide range of challenging situations. This type of self-efficacy is broad-ranging and stable. The second perspective is that of specific professional self-efficacy (Cherniss, 1993), defined as the belief that one is able to perform well in professional work roles.

In relation to its mediator role in stress, some authors (Bandura, 1997; Jex & Bliese, 1999; Schwarzer & Jerusalem, 1995) highlight the fact that self-efficacy acts as a stress control mechanism. Bandura (1997) argues that general self-efficacy is a better predictor of performance and tasks than specific self-efficacy, arguing that self-efficacy beliefs affect students' ability to effectively apply what they learn and therefore has a direct influence on academic performance.

Leadership is also a source of self-efficacy. Bandura (2000) postulates that leadership interacts with self-efficacy, giving rise to positive consequences for individuals' well-being and performance. Bass and Avolio (1995) identify transformational leadership as the type most closely linked to self-efficacy. This type of leadership is

characterized by a style oriented towards defending the interests of the group and generating a greater degree of awareness and acceptance of the established aims. Salanova (2009) provides evidence that this type of leadership decreases stress and burnout.

As in the case of professional nurses, the clinical areas which have been identified as most stressful for nursing students (Kit Lin, 2006) are those where quick action is called for (accident and emergency department) and those where students come into contact with death and the suffering of both patients and their families (palliative and intensive care units). These characteristics are also found in oncology units (Rodrigues & Chaves, 2008).

Nevertheless, available information is much scarcer in relation to surgical units (Cremades-Puerto, 2011), where the work itself, patients' needs and interpersonal relationships may be just as stressful as in other clinical areas. In general terms, the results in relation to nursing students are diverse and vary in accordance with the type of clinical area, the level of the placements themselves, the hospital organization and the type of stressors that predominate in each set of tasks. According to Sheridan et al. (2018), it is important to identify specific stressors to intervene appropriately. Procedural stress reflects the consequences of different factors, which can in turn influence clinical practices. Therefore, we can hope that self-efficacy and a protective environment may help students cope better with this type of stress. Emotional stress is a different factor that generally reflects fewer specific factors. Indeed, students' perceptions are more general and may be influenced by specific interactions with patients and their families. In light of this important difference, we decided to test both types of stress.

Based on the studies mentioned above, a series of classic predictors were taken into consideration (see Figure 1), namely year of the degree course which nursing students are currently on, their perception of the effectiveness and leadership of hospital managers, general self-efficacy, academic overload and hospital unit/service.

The principal aim of this study is to propose a predictive model for two different types of stress in clinical placements, testing general self-efficacy as a possible mediator factor.

3 | THE STUDY

3.1 | Design

An exploratory correlational study was designed to analyse stress in the clinical placements carried out by nursing students in relation to the variables discussed above. The selection criterion for recruiting the sample was that participants be nursing students.

3.2 | Method

3.2.1 | Participants and sample size

Participants were 334 nursing students from a spanish university during the 2016–2017 academic year, with a mean age of 23.56 (*SD* = 5.98). Of the sample group, 14% were men and 86% women. Only those students carrying out their placements at the University Hospital were included in the study. All were enrolled on one of the four nursing degree courses offered by the university. At the beginning of the research project, a different subsample (*N* = 330) was used for the exploratory factorial analysis (EFA) of the KEZKAK Questionnaire.

We used the GRANMO program to calculate the sample size based on a population comprising 590 nursing students, an (alpha) of 0.01, a 99% confidence level, an accuracy of 0.6 percentage units, a predictable population percentage of 50% and a replacement percentage of 40%. The program determined that a sample of 334 participants was sufficient.

3.2.2 | Data Collection procedure

After participants had been told about the study and had given their informed consent, the questionnaires were administered at the University Hospital itself during the course of their clinical internship. The questionnaire was administered on paper and took approximately 20 min to complete.

3.2.3 | Instruments

KEZKAK—Questionnaire on Stressors among nursing students engaged in clinical placements (Zupiria, Uranga, Alberdi, & Barandiaran, 2003). According to the confirmatory factorial analysis (CFA), this questionnaire comprises 40 items grouped into 8 factors: lack of competence, contact with death and suffering, relationship with tutors and colleagues, impotence and uncertainty, not being in control of one's relationship with patients, emotional involvement, getting hurt during one's relationship with patients and negligence and errors. Participants rated each item on a four-point Likert-type scale (1 = not at all, 4 = very much). The factors in the original KEZKAK were found to have a reliability level of between $\alpha = .71$ and $\alpha = .89$. The questionnaire measures the degree of stress perceived by nursing students in accordance with the frequency with which they perceive certain stressors that are considered universal for this population (Zupiria et al., 2007). For the purposes of this study, we used only 23 items grouped into five factors representative of procedural stress and emotional stress: "lack of competence," "impotence and uncertainty," "contact with death and suffering," "not being in control of one's relationship with patients" and "emotional involvement."

Coping Scale of Academic Stress Questionnaire (E-CEA) developed by Cabanach, Valle, Rodriguez, and Piñeiro (2008) and Cabanach, Valle, Rodríguez, Piñeiro, and González (2010). For the purposes of this study, a short version was used comprising 10 items corresponding to the academic overload factors. Participants rated each item on a five-point Likert-type scale (1 = never, 5 = always). This questionnaire has been applied in several different studies, and its factors have been found to have a reliability level of between $\alpha = .83$ and $\alpha = .93$. The instrument measures the level of academic demand, deadlines for handing in assignments, subject matter that needs to be studied for exams and time available, which constitute

the elements with the greatest impact on academic stress (Cabanach et al., 2008).

Generalized Self-efficacy Scale. The Spanish version of the scale developed by Schwarzer and Jerusalem (1995), comprising 10 items, was used in this study. Answers are given on a four-point Likert-type scale (1 = Not at all true, 4 = Exactly true). Its reliability varies between α = .75 and α = .90, and it measures respondents' beliefs about their own general ability and capacity to cope with different tasks (Grau, Salanova, & Peiró, 2012).

Effectiveness and Leadership of Hospital Managers Questionnaire. This questionnaire was developed with reference to the Spanish version of Bass and Avolio's (1995) MLQ—*Multifactor Leadership Questionnaire* (5X-Short) (Morales & Molero, 1995). It comprises 10 items and measures nursing students' perception of effective leadership among hospital managers about questions related to safety, rules and values and beliefs about patient safety. Answers are given on a five-point Likert-type scale (1 = Totally disagree, 5 = Totally agree).

Sociodemographic Questionnaire (developed ad hoc for the study). Information was gathered from respondents about the degree course on which they were carrying out their practical training, the year of the degree course they were currently in, their sex and age and the unit/hospital where they were carrying out their placements.

3.3 | Analysis

An EFA was conducted to test the original structure of the KEZKAK questionnaire with a subsample different from the principal sample used in the study. The new factorial solution was entered into the CFA. This type of analysis was conducted also to verify the structure of the E-CEA, G. Self-Efficacy and Effectiveness & Leadership questionnaires. We applied the structural equation method (SEM) to analyse the theoretical model for predicting stress in clinical placements.

We used the IBM SPSS statistical package (v.21) for the EFA, descriptive and correlational analyses and the IBM AMOS statistical package (v.21) for the CFA and SEM.

3.4 | Ethics

The study was approved by the University's Ethics and Research into Humans Commission. Students were recruited from a training course on patient safety organized by the hospital. Participants voluntarily completed the questionnaires by hand in approximately 20 min during one of the sessions of the training course. The corresponding authorization from the hospital management was obtained for this exercise and students' consent was obtained prior to the study.

4 | RESULTS

4.1 | EFA

For the EFA analysis, we used the first subsample (*N* = 330). The KEZKAK questionnaire presents a new regrouping of the items in an 8-factor solution (Table 1), which is moderately different from the original 9-factor version. This is the result of applying a principal component analysis with varimax rotation without forcing a solution with a specific number of factors [KMO = .93, Bartlett χ^2 (82) = 6,866 $p < .001$]. The variance explained was 60%.

In our study, the 5-item group in the "overload" factor disappears and four of these items are integrated into the "relationship with patients" factor, while the remaining item saturates in "impotence and uncertainty," consistently with the theoretical model. The reliability of the total scale was very good α = .94.

4.2 | CFA and reliabilities

The 8-factor model identified in the EFA was tested in the principal sample (*N* = 334) by means of a CFA. The fit indices indicated a good model fit [χ^2 (674) = 1,555.58, $p = .001$; $\chi^2/df = 2.308$, CFI = .90, IFI = 91, RMSEA = .06]. All items were salient (≥48), positive and statistically significant ($p < .001$). The 8 factors had correlations of between .27 and .73 ($p < .001$), values which do not indicate multicollinearity.

We specifically tested two different dimensions of stress: procedural stress (grouped on factor 1 *lack of competence:* items 2, 3, 4, 5, 6 and 7 and factor 4. *Impotence and Uncertainty*: items 15, 16 and 1) and emotional stress (grouped on factor 2. *Contact with death and suffering:* items 10, 14, 18, 27 and 39; factor 5. *Not being in control of one's relationship with patients:* items 29, 30, 31, 32, 33 and 34 *and* factor 6. *Emotional Involvement:* items 8, 9 and 21). In accordance with these factors, a total of 23 items from the KEZKAK were entered into the CFA to differentiate between procedural stress and emotional stress.

The CFA for procedural stress indices indicated an acceptable model fit [χ^2 (26) = 130.56, $p = .001$; $\chi^2/df = 5.006$, CFI = .93, IFI = 93, RMSEA = .11]. All items were salient (≥67), positive and statistically significant ($p < .001$). The 2-factor model had a correlation of .58, which did not indicate multicollinearity. The CFA for emotional stress indices indicated a good model fit [χ^2 (74) = 199.51, $p = .001$; $\chi^2/df = 2.696$, CFI = .92, IFI = 92, RMSEA = .07]. All items were salient (≥47), positive and statistically significant ($p < .001$). The 3-factor model had a correlation of between .64 and .77, values which do not indicate multicollinearity. Procedural stress and emotional stress were found to have good reliability scores (α = .87 and .88, respectively).

We used also a CFA to verify the factor structures of the rest of the questionnaires. Table 2 shows the factor structure confirmations for the E-CEA, G. Self-Efficacy and Effectiveness & Leadership instruments. We replicated the original structures of these questionnaires. All of them were found to have a good fit and good reliability.

4.3 | Descriptive and correlational analyses

Table 3 outlines the characteristics of the study sample. The data clearly show that the procedural stressors perceived as being most stressful are lack of competence and impotence/uncertainty. We

TABLE 1 Loading factors, mean values, standard deviation, % of variance explained, reliability level and item groups per factor of the KEZKAK questionnaire

	Loading factor	Mean	Standard Deviation
Factor 1. Lack of competence (10.3% variance, α = .87)			
it.04 Harming a patient	.78	2.99	1.10
it.03 Feeling I cannot help a patient	.75	3.14	0.83
it.06 Physically harming a patient	.72	3.16	0.97
it.05 Not knowing how to respond to patients' expectations	.68	2.92	0.82
it.02 Doing my work wrong and harming a patient	.68	3.60	0.68
it.07 Not knowing how to answer a patient	.60	2.83	0.82
Factor 2. Contact with death and suffering (8.74% variance, α = .82)			
it.18 Watching a patient die	.72	2.44	0.92
it.39 Having to be with a terminal patient	.65	2.17	0.91
it.27 Having to be with a patient's family while he or she dies	.63	2.49	0.92
it.10 Having to talk with a patient about their suffering	.54	2.47	0.87
it.14 That a patient who was improving begins to get worse	.50	2.78	0.76
Factor 3. Relationship with tutors and colleagues (8.24% variance, α = .86)			
it.19 My relationship with the teacher responsible for the placement	.78	2.61	0.95
it.25 My relationship with the associated clinical teacher	.75	2.60	0.88
it.12 My relationship with health professionals	.71	2.70	0.92
it.01 Not feeling like a true part of my working team	.61	2.74	0.95
it.28 My relationship with my fellow nursing students	.58	2.25	0.99
Factor 4. Impotence and uncertainty (8.17% variance, α = .72)			
it.41 The difference between what we learn in class and what we see	.65	2.52	0.84
it.38 Not being able to find a doctor when the situation so requires	.64	2.98	0.83
it.36 Receiving contradictory orders	.50	3.05	0.79
it.23 Not being able to get round to all patients	.45	2.65	0.81
it.22 The enormity of my responsibility when looking after a patient	.43	3.11	0.77
Factor 5. Not being in control of one's relationship with patients (7.17% variance, α = .85)			
it.30 Having to look after a patient with whom it is difficult to communicate	.66	2.31	0.76
it.34 Having to work with aggressive patients	.63	2.56	0.90
it.33 Not knowing how to "set limits" with patients	.60	2.10	0.80
it.32 Having to carry out procedures that cause patients pain	.54	2.73	0.83
it.31 Having to look after a patient from whom bad news is being kept	.54	2.77	0.84
it.29 Finding myself in an emergency situation	.52	3.02	0.81
Factor 6. Emotional involvement (6.6% variance, α = .68)			
it.08 That a patient's emotions will affect me	.77	2.62	0.86
it.21 Becoming too involved with/attached to a patient	.61	2.36	0.87
it.09 Having to give someone bad news	.58	2.94	0.87
Factor 7. Getting hurt during one's relationship with patients (5.6% variance, α = .85)			
it.40 That a patient may touch certain parts of my body	.72	2.60	1.11
it.24 That patients won't respect me	.64	2.37	0.90
it.37 That a patient of another sex may come on to me	.63	1.83	0.86
it.26 That a patient may file a formal complaint against me	.57	2.93	1.11
it.13 Catching something from a patient	.57	2.72	1.00
it.11 Being mistreated by a patient	.55	2.17	0.93
Factor 8. Negligence and Errors (5.3% variance, α = .81)			
it.16 Getting medication mixed up	.79	3.49	0.80
it.17 Making a mistake	.76	3.43	0.73
it.15 Pricking myself on an infected needle	.62	3.22	0.98

conducted the Wilcoxon paired test to evaluate individual differences in procedural stress and emotional stress, with 87% of nursing students scoring higher for procedural ($\bar{X}$ = 3.20, *SD* = 0.61) than for emotional stress ($\bar{X}$ = 2.55, *SD* = 0.53). This difference was statistically significant (*Z* = −13.609, *p* < .001). A correlational analysis was carried out (Table 4) between the two differential subfactors of the KEZKAK questionnaire (procedural stress and emotional stress) and the rest of the independent variables.

The correlation level between general self-efficacy and academic overload was analysed in accordance with academic level. No statistically significant correlations were observed in either the first or second years of the degree, although such correlations were found in both the third and fourth years, *r* = −.24, *p* < .05 and *r* = −.18, *p* < .05, respectively.

In the case of perceived leadership, the means differences were analysed (ANOVA) in accordance with academic level. Statistically significant differences were observed *F*(330,3) = 9.093, *p* < .001. Tukey's HSD test revealed that first- and second-year students scored higher (*p* < .05) for perceived leadership ($\bar{X}$ = 4.04, *SD* = 0.47 and $\bar{X}$ = 3.90, *SD* = 0.54, respectively) than third- and fourth-year students ($\bar{X}$ = 3.50, *SD* = 0.75 and $\bar{X}$ = 3.58, *SD* = 0.76, respectively).

4.4 | Predictive model analysis

This model included the results found previously in the ANOVA on perceived leadership in accordance with academic level. It was therefore decided to test its predictive power for the different types of stress. The predictive stress model was therefore verified in accordance with that proposed in the theoretical model (Figure 1). The initial model was proposed for predicting procedural stress and emotional stress. Model 1 for procedural stress (Figure 2) was found to have an adequate fit χ^2 (7) = 12.797 *p* = .08; χ^2/df = 1.828, CFI = .90, IFI = .92, RMSEA = .05. The results revealed that Model 1 for procedural stress was on the limit of statistical significance. However, it was observed that general self-efficacy (ß = −.01, *SE* = .08, *p* = .89) and perceived leadership (ß = −.06, *SE* = .05, *p* = .28) did not work directly as good predictors of procedural stress in clinical placements. Model 1 for emotional stress (Figure 2) was not found to have an adequate fit χ^2 (7) = 16.615 *p* < .02; χ^2/df = 2.374, CFI = .86, IFI = .88, RMSEA = .06. The results revealed that hospital unit (ß = .10, *SE* = .05, *p* = .08) and perceived leadership (ß = .16, *SE* = .06, *p* = .07) did not work simultaneously as good predictors of emotional stress in clinical placements.

We rejected the null hypothesis implicit in the theoretical model because these predictors were not significant. A second model was then verified. The non-significant regression of perceived leadership on emotional stress belies the possibility that general efficacy acts as a mediator factor in this relationship with perceived procedural stress. The direct predictive power of perceived leadership on procedural stress and emotional stress was eliminated from the model. In the case of procedural stress prediction, we removed general self-efficacy and given that the self-efficacy measured was general rather than specific, the next step was to eliminate from the model its direct predictive power for procedural stress in clinical placements.

Model 2 for procedural stress (Figure 3) was not found to be statistically significant and had a good fit: χ^2 (9) = 13.931, *p* = .125; χ^2/df = 1.548, CFI = .91, IFI = 93, RMSEA = .04. In this final model, both academic overload (ß = .22, *SE* = .04, *p* = .001) and hospital unit (ß = .11, *SE* = .03, *p* = .001) directly and significantly predicted perceived procedural stress in clinical placements. Model 2 for emotional stress (Figure 3) was statistically significant and had an acceptable fit: χ^2 (4) = 11.932, *p* < .02; χ^2/df = 2.983, CFI = .90, IFI = 90, RMSEA = .07. In this final model, both academic overload (ß = .22, *SE* = .04, *p* = .001) and general self-efficacy (ß = −.13, *SE* = .07, *p* = .02) directly and significantly predicted perceived emotional stress in clinical placements. It is common in large samples (*n* ≥ 200) to find statistically significant p values, because the chi-square criterion is sensitive to sample size. However, given the optimal results of those fit indices (CFI, IFI and RMSEA) less sensitive to sample size, we accepted this final Model 2 for emotional stress, even though chi-square was statistical.

Finally, two complementary ANOVA analyses were carried out to detect any possible significant differences in the two types of stress in accordance with hospital department and sex of students. As shown in Table 5, significant differences were found only in procedural stress, with outpatient care being the department with the lowest level.

To compare similar size groups in accordance with sex, a random selection (SPSS) was made of 49 women with similar scores to men (*N* = 46) in the variables general self-efficacy, academic overload and perceived leadership, as well as a similar distribution by academic level and hospital department. Significant differences were found only in relation to procedural stress (Table 6), with women scoring higher than men.

5 | DISCUSSION

All instruments were found to have good reliability indicators. The reliability parameters were very similar to those obtained in other

TABLE 2 Confirmatory factorial analysis: fit index and reliability coefficients

Questionnaire	χ^2	χ^2/df	*p*-value	IFI	CFi	RMSEA	Reliability
E-CEA	χ^2 (35) = 208.70	5.963	.001	.92	.92	.12	α = .95
G. Self-Efficacy	χ^2 (35) = 143.66	4.105	.001	.90	.92	.10	α = .84
Effectiveness and leadership	χ^2 (35) = 208.68	5.960	.001	.93	.92	.10	α = .92

studies (Cabanach et al., 2010; Schwarzer & Jerusalem, 1995). One new finding was that the KEZKAK questionnaire presented an 8-factor solution as opposed to the original 9-factor solution (Zupiria et al., 2003). The presence of 3 items in the new factor "negligence and errors," which had originally been included in the "lack of competence" factor in the original version of the questionnaire (Zupiria et al., 2003), can be justified by understanding that lack of competence may stem from something as specific as negligence and errors in professional praxis.

One new finding was that the KEZKAK questionnaire can be presented as a short 2-factor solution. As a result, we have an effective and operative version of the original 9-factor solution (Zupiria et al., 2003). The proposal of two important and different latent constructs (procedural and emotional stress) and the fact that nursing students scored higher for procedural than for emotional stress suggest the importance of effective education programmes addressing this key question.

The mean values found for the different variables did not vary in relation to the means reported in other studies and in general represent a population of students with a medium level of academic overload, high levels of general self-efficacy and perceived leadership and a moderate level of perceived stressors. In the last case, the main stressor was found to be "lack of competence" followed by and "impotence and uncertainty." Our results are consistent with those reported by Zupiria et al. (2007).

The significant correlations observed between academic overload and both general self-efficacy and emotional stress in clinical placements are consistent with the theoretical framework postulated by several authors (Cabanach et al., 2010; Schwarzer & Jerusalem, 1995; Zupiria et al., 2003). This detailed correlational analysis of the KEZKAK questionnaire factors with general self-efficacy revealed a statistically significant association in the case of factors related to emotional exhaustion, as described by Grau et al. (2012). This finding highlights the relationship which exists between self-efficacy, in its most general sense and students' ability to cope with academic overload, particularly during the final years of their nursing degree course and also in relation to the emotional problems inherent in clinical praxis. Consistently with this, a study by Fornés-Vives et al. (2019) has revealed that the emotion-focused coping style is the one most commonly used by nursing students.

TABLE 3 Characteristics of participating trainee health professionals and mean values in the different variables analysed

	N	% Valid
Sex		
Men	46	14.0
Women	288	86.0
Age* [range], mean and *SD	[17–40], 23.5 5.97	
Academic level		
1st year	30	9.0
2nd year	100	30.0
3rd year	68	20.3
4th year	136	40.7
Hospital departments		
1. Outpatient care: Day clinics, primary care and rehabilitation	14	4.2
2. Medical-surgical inpatient care: Medical and surgical inpatient units	172	51.5
3. Critical-special services: Intensive care, accident and emergency and the OR	61	18.3
4. Mother and child care: Maternity and paediatrics, obstetrics, gynaecology	62	18.6
5. Other areas	25	7.4
Scales	**Mean**	**Standard deviation**
Perceived leadership (range 1–5)	3.71	0.65
General self-efficacy (range 1–4)	3.04	0.39
Academic overload E-CEA (range 1–5)	3.03	0.83
Procedural stress, KEZKAK F1 and F4 (range 1–4)	3.20	0.61
Factor 1 KEZKAK: Lack of competence	3.05	0.67
Factor 4 KEZKAK: Impotence and uncertainty	2.86	0.55
Emotional stress, KEZKAK F2, F5 and F6 (range 1–4)	2.55	0.63
Factor 2 KEZKAK: Contact with death and suffering with patients	2.54	0.57
Factor 5 KEZKAK: Not being in control of one's relationships with patients	2.52	0.57
Factor 6 KEZKAK: Emotional involvement	2.63	0.67

TABLE 4 Bivariate correlations

	1	2	3	4	5
1. Leadership	–				
2. General self-efficacy	.10	–			
3. Academic overload	−.01	−.17**	–		
4. Procedural stress	−.06	−.02	.22**	–	
5. Emotional stress	.14	−.16**	.24**	.47**	–

**$p < .01$.

These results seem to corroborate the fact that specific self-efficacy, understood in this context as beliefs about one's capacity to successfully play the role of nursing student (Pierazzo, 2014), may be associated with stressors linked to procedural issues, with general self-efficacy and specific self-efficacy acting as mediator variables in accordance with the specific type of stressor in question (Grau et al., 2012). It is therefore vital that nurse educators should understand the importance of this type of self-efficacy (Rowbotham & Scmitz, 2013) and its implications for coping with stress (Gibbons, 2010). Moreover, in a more general context, it has been found that specific self-efficacy can be improved through specific teacher practices, thus having an impact on student engagement and learning (Linnenbrink & Pintrich, 2003).

The lower level of perceived hospital leadership and effectiveness among students in the last two years of their degree course in comparison with their counterparts from the first two years is most likely due to the fact that the latter have a less realistic, more idealized view and less direct experience of the hospital environment and its managers.

The final predictive model for procedural stress in clinical placements reveals that academic overload and hospital unit act as direct predictors, basically linked to students' experience and learning. These results suggest that nursing students may associate clinical placements and academic overload as two sources of procedural stress in their healthcare training program, in accordance with that found by Rhead (1995).

The findings are also consistent with that proposed by Tosevski, Milovancevic, and Gajic (2010), who pointed out that different sources of stress exist in health professional training processes, including (among other factors) academic overload, constant pressure to achieve good marks, competition with colleagues and the little time available to spend with family members.

Moreover, in accordance with the results obtained in the model analysed, it is important to bear in mind that general self-efficacy does not act as a mediator in procedural stress, but rather as a factor which covaries with academic overload, directly predicting emotional stress. Also important is the role played by academic

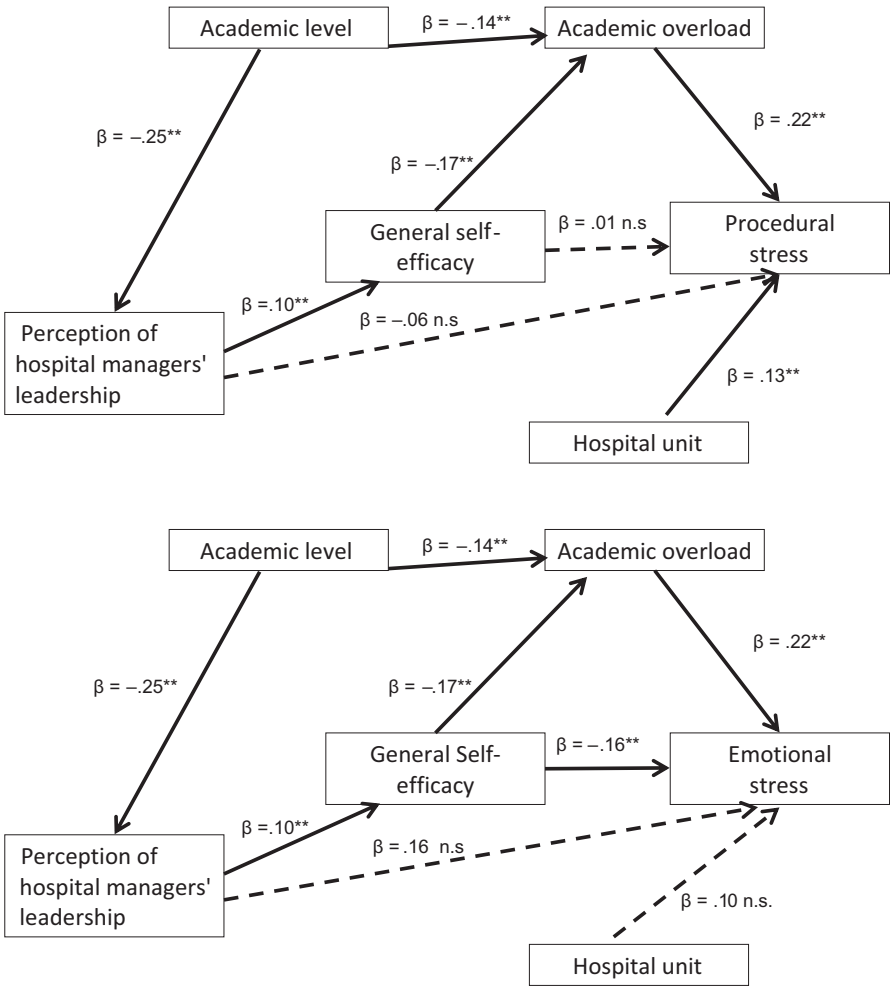

FIGURE 2 Model 1 for predicting stress in clinical placements among nursing students

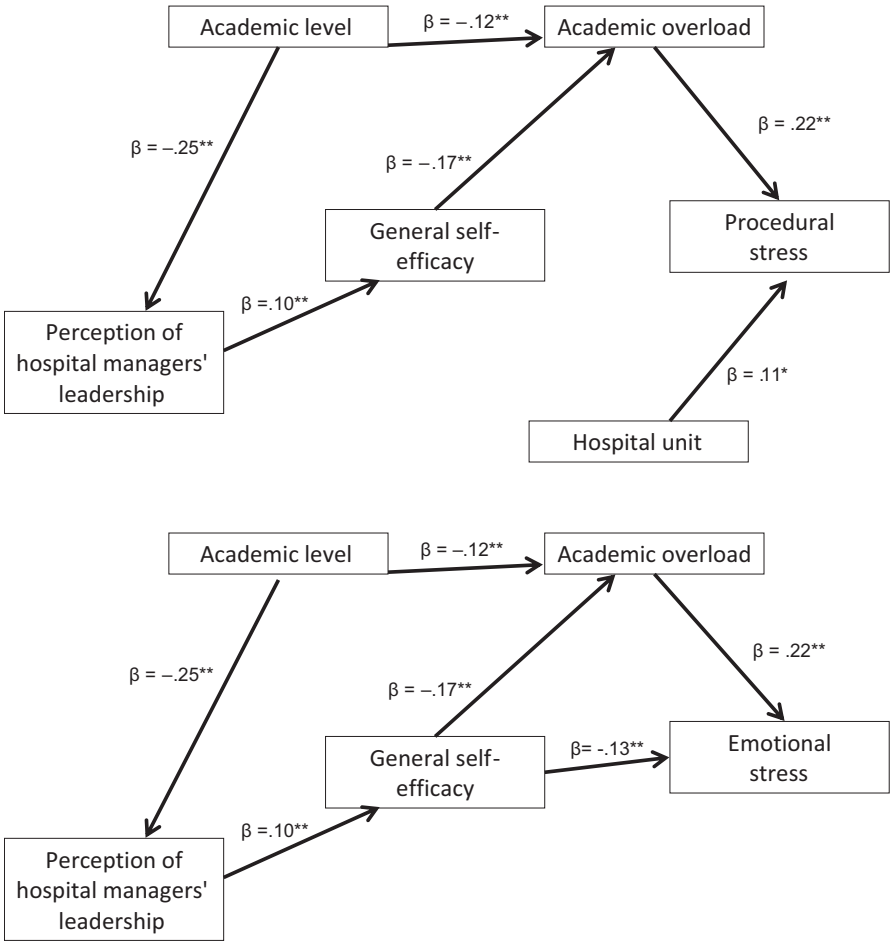

FIGURE 3 Model 2 for predicting stress in clinical placements among nursing students

level (not so much as regards its direct effect on stress, but rather in relation to perceived leadership and academic overload), as is the fact of carrying out clinical placements in units considered to be more stressful.

In light of these findings, future studies should analyse the mediator role played by specific self-efficacy in stress during clinical placements, paying special attention to questions such as self-efficacy for care (Livsey, 2009), self-efficacy for clinical praxis (Babenko-Mould, 2012) and self-efficacy for giving advice on healthy living guidelines (Laschinger, McWilliam, & Weston, 1999), among others.

This study also reveals that procedural stress varies significantly in accordance with hospital department. Our findings are consistent with those reported by Kit Lin (2006), who also observed higher procedural stress levels in critical-special services, maternity and childcare. The fact that very low stress levels were found in outpatient care may be influenced by the shorter mean interaction time with acute patients and because visits and contacts with patients are usually scheduled.

In contrast to that found by Cervera-Gasch, Maciá-Soler, Mena-Tudela, and González-Chordá (2018), it was in outpatient or primary care that we also found the lowest levels of perceived leadership. This may be due to the fact that during clinical practices in primary healthcare centres, the student maintains very close contact with family nurses, who in turn have significant autonomy in the care of their patients (Flinter, Hsu, Cromp, Ladden, & Wagner, 2017). This circumstance can hinder the perception of leadership both in the team and the institute.

Concerning sex differences, the fact that women scored higher for procedural stress than men is consistent with the results reported by other studies (Suarez-García, Maestro-González, Zuazua-Rico, Sánchez-Zaballos, & Mosteiro-Diaz, 2018; Valero-Chillerón et al., 2019). However, in our study, the differences observed in emotional stress were less clear. One possible explanation for this may be linked to the persistence of a socializing model of femininity which pushes women to experience caring behaviour, the "epicentre" of procedural stress, more intensely (Liu, Hsu, Hung, Wu, & Pai, 2019).

This study is subject to certain limitations. Besides interaction time with patients and the sex of the students, no other factors, such as stress of daily life, home–academy interface and financial situation (Pulido-Martos, Augusto-Landa, & López-Zafra, 2012) were taken into consideration. Nor were specific self-efficacy and coping style measures employed in the longitudinal study.

6 | CONCLUSIONS

The fact that general self-efficacy does not mediate perceived procedural stress in clinical placements reveals the importance of providing students with tools and specific actions aimed at fostering their

TABLE 5 ANOVA: differences in procedural stress, emotional stress and perceived leadership by hospital department

	Procedural stress		Emotional stress		Perceived leadership	
	Range 1–4		Range 1–4		Range 1–5	
Hospital Departments	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
1. Outpatient care: Day clinics, primary care and rehabilitation	2.71*,**	0.92	2.29	0.50	3.35	0.49
2. Medical-surgical inpatient care: Medical and surgical inpatient units	3.15	0.62	2.54	0.55	3.80	0.66
3. Critical-special services: Intensive care, accident and emergency and the OR	3.31*	0.45	2.59	0.42	3.60	0.65
4. Mother and childcare: Maternity and paediatrics, obstetrics, gynaecology	3.35**	0.51	2.62	0.56	3.57	0.64
5. Other areas	3.13	0.75	2.54	0.64	3.85	0.63

Note: Procedural stress $F(324,4) = 3.899$, $p < .004$.
Post hoc HSD Tukey.
*$p = .011$.
**$p = .006$.

specific self-efficacy linked to their professional role (Cherniss, 1993). The main aim would be to transfer and adapt some of these practices (Linnenbrink & Pintrich, 2003) to the nursing student training process (e.g. to provide reasoned and specific feedback on clinical praxis, to learn new skills and develop expertise and to foster the belief that competence and abilities are good skills for reducing stress).

Providing we accept the greater mediator role played by specific self-efficacy in comparison with general self-efficacy, these actions, along with the use of psychoeducational intervention programmes aimed at improving coping skills (McCarthy et al., 2018), particularly in the first years of training, may help reduce stress levels. More specifically, we believe it is important to measure specific self-efficacy (ability to fulfil a professional role) among nursing students as a mediator for procedural stress in clinical placements.

Similar conclusions can be drawn in relation to coping with procedural stress in accordance with type of clinical area (Kit Lin, 2006). This factor can have a concomitant effect on stress in clinical placements, depending on the mediator role of specific self-efficacy.

Finally and in accordance with that postulated by Salanova (2009), since transformational leadership is associated with decreased stress and burnout, it would be interesting to analyse in the future the influence of those hospital leaders who strive to provide students with specific tools and actions aimed at helping them achieve a higher level of specific self-efficacy. In addition to mitigating the effects of stress, the direct empowerment of nursing students by hospital leaders may also help improve clinical placements, especially as perceived leadership levels tend to decrease during the final two years of the degree course, as reflected in our results.

This model can be used to help nurse educators identify deficient self-efficacy levels and ensure that nursing curricula, clinical practices and schedules are correctly programmed so as to reduce nursing students' stress levels, in accordance with the specific nature of procedural stress and emotional stress.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

The authors meet the authorship criteria. They are in agreement with the content of the manuscript.

TABLE 6 ANOVA: differences in procedural stress and emotional stress by sex

	Male		Female			
	N = 46		*N* = 49			
Type of stress	*Mean*	*SD*	*Mean*	*SD*	*F*	*p*
Procedural stress[a]	3.00	(0.63)	3.30	(0.51)	$F(93,1) = 6.013$	$p < .02$
Emotional stress[b]	2.31	(0.55)	2.43	(0.46)	$F(93,1) = 1.423$	n.s

Note: Homogeneity of variance.
[a]Levené test = 2.036, $p = .157$ n.s.
[b]Levené test = 1.458, $p = .230$ n.s.

AUTHOR CONTRIBUTIONS

JOE, MSM: Designed the study. JOE, AOE: Collected the data. MSM, AIO, AO: Carried out the statistical analysis. JOE, AOE: Conducted the literature searches. MSM, AIO, AO: Wrote the first draft of the manuscript. All results were discussed among the authors. All authors contributed to and have approved the final manuscript.

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