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Study skills intervention addressing academic stress and self-efficacy in newly admitted university students

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Abstract

Introducción. El estrés académico es un problema importante en la educación superior y puede ser un factor de riesgo para otros futuros problemas académicos y de salud mental. Los programas para reducirlo se han centrado en intervenciones de corte psicológico (mindfulnes, terapia cognitivo-conductual, etc.), obviando intervenciones centradas en el fomento de habilidades de estudio y aprendizaje. Una alta autoeficacia académica constituye un factor protector para muchas problemáticas académicas. El objetivo de este estudio fue analizar la eficacia de una intervención basada en la enseñanza de habilidades de estudio para reducir el estrés académico y aumentar la autoeficacia académica de los estudiantes de Enfermería de nuevo ingreso de una universidad española.

Método. Se diseñó un estudio controlado con mediciones pretest y postest, llevado a cabo en un grupo de 206 estudiantes de Enfermería de 1º curso, que respondieron al Cuestionario de Estrés Académico Universitario y al Cuestionario de Autoeficacia Académica General. La intervención completa de subdividió en tres intervenciones (Gestión de tiempo, Técnicas de estudio/estrategias de aprendizaje, Preparación de exámenes) que se realizaron en modalidad grupal e individual. Para determinar su eficacia se recurrió a un modelo de análisis multivariante (ANOVA mixto).

Resultados. Los resultados mostraron mejoras significativas en el grupo experimental, en la autoeficacia académica y disminución del estrés producido por la sobrecarga académica, por la tarea de estudiar y por la realización de exámenes, con un efecto mantenido durante todo el 1º curso de universidad. En el grupo control no se observaron estas mejoras.

Discussion and conclusions. Se discuten los resultados y las implicaciones de los mismos para la implementación de programas basados en habilidades de estudio en la universidad, y se sugieren propuestas futuras en este tipo de intervenciones dirigidas a la reducción del estrés académico y al aumento de la autoeficacia académica en los estudiantes universitarios.

Palabras Clave: Estrés, Autoeficacia, Estudiantes universitarios, Educación superior, Intervención en habilidades de estudio.

Abstract

Introduction. Academic stress is a significant issue in higher education and can be a risk factor for academic and mental health problems. Programmes to reduce academic stress have often focused on psychological interventions (mindfulness, cognitive-behavioural therapy, etc.), while neglecting the development of study and learning skills. High academic self-efficacy is a protective factor for many academic issues. The aim of this study was to determine the effectiveness of an intervention to teach study skills in reducing academic stress and increasing academic self-efficacy among first-year Nursing students at a Spanish university.

Method. A controlled study with pretest and posttest measurements was designed and conducted with a group of 206 first-year Nursing students who completed the University Academic Stress Questionnaire and the General Academic Self-Efficacy Questionnaire. The intervention was divided into three components (Time Management, Study Techniques/Learning Strategies, Exam Preparation), delivered through group and one-to-one sessions. A mixed design analysis of variance (ANOVA) was used to assess effectiveness.

Results. The results demonstrated significant improvements in the experimental group, both in academic self-efficacy and in the reduction of stress related to academic overload, study tasks and exam performance. These effects were sustained throughout their first-year of study. No such improvements were observed in the control group.

Discussion or **Conclusion**. The results and their implications for the implementation of study skills programmes in university settings are discussed and suggestions are made for future interventions to reduce academic stress and improve academic self-efficacy in university students.

Keywords: Stress, Self-Efficacy, University Students, Higher Education, Study Skills Intervention.

Introduction

Going to university entails a number of changes and personal, social and academic challenges (Ahmady et al., 2021; León et al., 2019). Many students handle the transition successfully. However, for others those changes can be a source of anxiety and stress, and may make them feel that they do not have the capacity to cope with everyday situations in university life.

Stress is a significant and common problem in higher education students (Emiro et al., 2023; García-Ros et al., 2012). Three types of stressors that face students have been identified: academic stressors, stressors arising from placements with external organisations (hospitals, clinics, etc.) and external stressors (financial, social, etc.) (Jiménez et al., 2010). Academic stressors have the greatest impact (Reis et al., 2021; Shudifat & Al-Husban, 2015). Academic stress (AS) can be defined as 'stress arising from the demands intrinsic to an academic environment, without regard to any material impact of non-academic aspects of university life' (Arribas, 2013, p 1, Translation Authors) Different studies have found a greater than 70% prevalence elevated AS in university students (García-Ros et al., 2012; Joseph et al., 2021). Exams, academic overload, lack of time to complete academic tasks and oral presentations are some of the academic situations that generate the greatest stress (Arribas, 2013; Chust-Hernández et al., 2022; García-Ros et al., 2012; Souto-Gestal et al., 2019). A certain level of AS is required to stimulate learning and improve the performance of university students (You, 2018). However, when AS is elevated it can be a risk factor for mental health problems such as anxiety (Pozos-Radillo et al., 2021), depression (Souto-Gestal et al., 2019), emotional distress or sleep problems (Casuso-Holgado et al., 2019), as well as for academic problems such as poor adjustment to university (Belay et al., 2018) and poor academic results (Magnavita & Chiorri, 2018).

Self-efficacy, defined within the framework of the cognitive social theory of Bandura (1997), is an individual's belief in their own capacity to mange and complete the courses of action required to attain specific goals. In learning contexts, this construct is called academic self-efficacy (ASE) and comprises the set of opinions that each individual has about their own capacity to manage and complete the actions required to cope successfully with situations within the academic environment. ASE has received significant attention in relation in academic contexts, and has been identified in higher education as a factor with important impacts

on learning. Thus, it has been shown that university students with high levels of ASE have greater persistence in learning (You, 2018), are less stressed by academic demands, adjust better to university (Çınar-Tanrıverdi & Karabacak-Çelik, 2023), and achieve better rates of academic success (Putwain et al., 2013).

So that all students can achieve their potential and reach their best levels of performance, it is fundamental that universities address their needs (Hitches et al., 2023). This means that addressing AS should be a first order priority in light of its harmful consequences and prevalence among university students. It is therefore important that universities adopt measures and strategies to help students to minimise the impact of AS (De la Fuente-Arias et al., 2014; Emiro et al., 2023; Shudifat & Al-Husban, 2015; Valdivieso-León et al., 2020) and lessen their ASE. It seems reasonable to suggest that such efforts should be effective from the first term. It has been shown that AS can be found in students from the start of their studies (Jiménez et al., 2010; Shudifat & Al-Husban, 2015) whilst ASE is lower in the first term than in subsequent terms (Çınar-Tanrıverdi & Karabacak-Çelik, 2023).

Over recent decades many measures have been introduced to reduce AS in university students (for a recent review, see Chust et al., 2023). Those measures include: mindfulness programmes; cognitive-behavioural therapy; psychological education and mind-body relaxation techniques; coping strategies sessions; alternative therapies, etc. However, according to the review by Chust et al. (2003), the only measure whose effectiveness has been evaluated is a study skills programme (Baumgartner & Schneider, 2021). That is something that stands out, since the scientific literature has demonstrated the relationship between AS and deficits in different study skills, such as time management (Abojedi et al., 2023; Ahmady et al., 2021); learning strategies/self-regulated learning (De la Fuente-Arias & Amate-Romera, 2019; Yang et al., 2019), and academic self-efficacy (Çınar-Tanrıverdi & Karabacak-Çelik, 2023; Kordzanganeh et al., 2022).

Objectives and hypotheses

The objective of this study is to assess the effectiveness of an intervention to teach study and learning skills to reduce academic stress and increase academic self-efficacy in Nursing students in their first term at a Spanish university.

Method

This was a quasi-experimental, longitudinal, quantitative study with pretest and post-test measurements.

Participants

An intentional sample was selected from among newly admitted students (in their first term) studying for a degree in Nursing at a Spanish university. Participation required students to be present in class on the two days in which the questionnaires were administered and to have sufficiently good understanding of written Spanish. No exclusion criteria were implemented.

The sample was made up of 206 students (80.1% women) whose access qualifications were the Health Sciences baccalaureate (secondary school leaving qualification): 60.7% and health Vocational Training: 20.4%. The rest had followed other courses of study (non-health vocational training, other university degrees and entry tests for mature student (over 25, over 40)). The majority (84%) has chosen a Nursing degree as their first option.

Instruments

Academic stress was measured using the University Academic Stress Questionnaire (CEAU in its Spanish initials) (García-Ros et al., 2012), a self-report instrument containing nineteen items concerning potentially stressful university academic circumstances. Responses were operationalised with a scale of five response statements: 1 = No stress at all, up to 5 = A lot of stress. The questionnaire has four subscales: Academic Obligations (AO); Future Plans and Expectations (FPE); Interpersonal Difficulties (ID); and Expression and Communication of Ideas (ECI). The score for each subscale was the arithmetic means of the 1-5 scores for responses to the items for that subscale. A higher score indicates greater AS. The questionnaire's authors have reported consistency levels in the population of university students in Spain of $\alpha = .80$ for the AO subscale, $\alpha = .70$ for FPE, $\alpha = .78$ for ID and $\alpha = .74$ for ECI. As explained below, the study intervention addressed solely issues concerning academic obligations. As such, this study used the Academic Obligations subscale alone.

Academic self-efficacy was measured using the General Academic Self-Efficacy Questionnaire (CAAG in its Spanish initials) (Torre-Puente, 2007), a self-report instrument

containing nine items aimed at university students. Responses were operationalised with five numbered statements, where 1 = I totally disagree, I'm nothing like that, that has nothing to do with me, to 5 = I totally agree, that's exactly what I'm like. The final scores falls between 9 and 45; there are no subscales. A higher score indicates greater ASE. In the population of university students in Spain, the author reports internal consistency of $\alpha = .90$.

Sociodemographic data (gender, age) and information concerning path to university (access route, preference for Nursing) were also collected.

Procedure

The pretest was administered to all first-year Nursing students on the first day of class in the 2017-2018 academic year (September 2017). The intervention took place over the course of the academic year. It was given by a qualified member of the study team, whose normal role is to provide academic guidance to students at the university at which the study was conducted. Posttest was administered on the first day of class in the 2018-2019 academic year, as students started their second year. Students present for the administration of both surveys were considered eligible to participate.

The intervention was sub-divided into three distinct educational guidance interventions addressing three different issues: time management, study techniques/learning strategies and exam preparation. Each intervention comprised group and one-to-one sessions. Group work consisted of workshops in the first four months of the academic year around the three topic areas: (a) Time Management workshop, which worked: setting targets and objectives; monthly and weekly planning; prioritising tasks; setting goals for each day; optimising study time; managing distractions and 'time thieves'; and, monitoring our time management plans. (b) Study Techniques and Learning Strategies workshop, which worked: study techniques (underlining, outlines, mind maps, conceptual maps, summarising); environmental factors and behaviours involved in learning; metacognition; and, memorisation techniques. (c) Exam Preparation workshop, which worked: preparing for and sitting essay and short answer exams and multiple-choice tests. Each workshop lasted two hours. The workshops worked the content in a practical, hands-on way and the students were given appropriate resources and tools. The one-to-one sessions addressed the same topics as the workshops (time management, study techniques and learning strategies, and exam preparation) but personalised to each student's specific needs. The one-to-one sessions lasted 45-75 minutes. Attendance was volun-

tary and free of charge. The interventions were offered to all students at the start of the academic year in person in their lecture theatres following administration of the pretest and in a subsequent email. Students were free to attend the number of workshops and one-to-one sessions they chose, such that the intervention as a whole was not uniform across participants.

The impact of the three interventions (time management, study techniques/learning strategies and exam preparation) on the dependent variables (Academic Stress and Academic Self-Efficacy), was measured by reference to independent variables as follows. Time Management (TM) Intervention; Study Techniques and Learning Strategies (ST/LS) Intervention; and, Exam Preparation (EP) Intervention. The three variables were dichotomous: for each of them the experimental group comprised students who attended the corresponding group or one-to-one intervention at least once. The control group comprised the remaining students who did not attend any of the interventions.

The dependent variables were specified as: total score for the CAAG; total score on the Academic Obligations subscale of the CEAU and the items in that subscale that refer to specific academic stressors. Those items were: Sitting Exams (AS1); Academic Overload (having a lot of exams and assignments) (AS5); Not enough time to complete academic tasks (AS6); Doing compulsory assignments to pass courses (AS8); The task of studying (AS9); Being able to go to every class (AS12); and, Too many commitments to be able to fulfil all academic obligations (AS13).

The study was approved by the Ethics Committee of the Bioethics Association of Valencia. Participants were informed verbally and in writing about the purpose of the research and signed informed consent forms. There were no repercussions for students who did not participate.

The reason for which each person attended the one-to-one sessions was known because they registered by name for each session. The attendance register was kept confidential and was reviewed by only one member of the study team. Attendance registers were circulated at each workshop and retained by the same researcher, so that it is known which students attended the workshops.

Participant anonymity was ensured by giving each person's questionnaire a code number.

Data analysis

The Missing Completely at Random (MCAR) test of Little and Rubin (2002) was used to identify missing values. The internal consistency of the questionnaire and its dimensions was measured through reliability analysis using Cronbach's alpha.

Student's t test was used for contrast testing of pretest and posttest in each group (experimental and control). A record was made of: the difference and confidence interval; the T contrast value and its associated p-value, and Cohen's d to estimate effect size. Cohen's d was classified as low ($0.20 \leq d \leq 0.49$), moderate ($0.50 \leq d \leq 0.79$) and high ($d \geq 0.80$), as categorised by Cohen (1988). Subsequently, mixed ANOVA was carried out to estimate the effects of the interaction between the intrasubject (pretest-posttest) and intersubject (control-experimental group) factors (in other words, to determine the effect of the intervention on dependent variables SA and ASE). F-test and associated p-values were recorded, as was the estimated effect size (partial eta squared), classed as low (partial $\eta^2 \approx .01$), moderate (partial $\eta^2 \approx .06$) and high (partial $\eta^2 > .14$), following Cohen (1988). Finally, Spearman's correlation coefficient was used to determine the association between the number of sessions that students attended and levels of AS and ASE at posttest. Values of p below .05 were taken as significant. Practical significance was based on the following values: confidence interval and estimated effect size.

SPSS v 27 was used for statistical analysis.

Results

Missing values were identified. When non-responses were imputed by the estimated mean of the relevant series, there were significant differences with the Student's t test for pairs of items (present/missing). Similar MCAR of the covariance and correlation matrices produced significant chi squared values ($\chi^2 = 694.08$; $gl = 610$ and $p = .01$), which puts in doubt the randomness of those values and suggests that imputation would be appropriate. That argument together with the fact that there were items with 5% or more of non-responses (the components in which there was the greatest level of non-response did not exceed 1.5% and

there were only two), spurred us to work with the complete sample of students, imputing the mean of the relevant series to substitute for missing values.

Reliability of items was determined using Cronbach's alpha both in the control group and in the three experimental groups. Those values were high and are set out in Table 1.

Table 1. *Reliability (Cronbach's α)*

	Control group	TM Intervention group	ST/LS Intervention group/	EP Intervention group
ASE pretest	.860	.847	.826	.865
ASE posttest	.926	.919	.895	.918
AS-AO pretest	.740	.751	.686	.757
AS-AO posttest	.802	.776	.765	.787

As noted above, for each of the interventions the experimental group comprised students who attended a group or one-to-one session for that intervention at least once. In relation to the Time Management intervention, 48 students (23.3% of the total sample) attended group workshops and 32 attended the one-to-one sessions (mean number of sessions 2.09). In the Study Techniques/Learning Strategies intervention, 58 students (28.2%) attended group workshops and 35 attended the one-to-one sessions (mean number of sessions 2.17). Finally, 47 students (22.8%) attended the group workshops for the Exam Preparation intervention, whilst 12 attended the one-to-one sessions (mean number of sessions 1).

Comparisons

Tables 2, 3 and 4 show descriptive statistics (mean and standard deviation) for the Academic Self-Efficacy (ASE) and Academic Stress (AS) variables in both groups (experimental and control) at the point of test (pretest and posttest) for each intervention. Time Management (Table 2), Study Techniques/Learning Strategies (Table 3), and Exam Preparation (Table 4). Also shown are the results of Student's t-test and ANOVA and estimated effect sizes.

Time Management intervention

As can be seen from Table 2, there is a significant increase in ASE in both groups (EG [*n* = 62] and CG [*n* = 107]) from pretest to posttest, albeit the effect is greater for EG (-0.704) than for CG (-0..488). For Items AS5 *Academic Overload* and AS6 *Lack of time to complete academic tasks* in academic stress, the EG experienced a significant reduction following the intervention, whilst there was no change in the CG. For Items AS1 *Sitting exams* and AS9 *The task of studying*, in the CG there was a significant increase between pretest and posttest, whilst in the experimental group there were no significant changes over that interval. For the remaining items, no significant changes were observed between pretest and posttest in either group.

The results from ANOVA show significant effects in ASE [F (1,167) = 5.022, p =.026, partial η^2 = .029] and for Items AS5 *Academic Overload* [F (1,167) = 11.260, p <.001, partial η^2 = .063] explained by the interaction of intrasubject (time of testing) and intersubject (between groups) factors. For the remaining AS items there were no significant effects explained by such interaction.

Table 2**.** *Time Management intervention. Descriptive statistics at pretest and posttest, Student's t-test, ANOVA F and effect sizes*

Variable	Group	Pretest Mean (*SD*)	Posttest Mean (*SD*)	Pre-Post Difference [95% CI]	Student's t (p value)	Effect size (Cohen's d)	ANOVA F (*p* value) Intra-Inter Interaction	Partial η^2
ASE	CG	33.73 (4.78)	35.67 (5.66)	+1.94 [1.18-2.70]	-5.044 (<.001***)	-0.488	5.022	.029
	EG	31.17 (4.85)	34.68 (5.94)	+3.51 [2.24-4.77]	-5.542 (<.001***)	-0.704	(.026*)	
AS-AO	CG	3.08 (0.70)	3.18 (0.78)	+0.08 [-0.03-0.23]	-1.516 (.133)	-0.147	2.810	.017
	EG	3.40 (0.65)	3.32 (0.70)	-0.08 [-0.25-0.09]	0.961 (.341)	0.122	(.096)	
AS1	CG	3.52 (0.98)	3.83 (1.01)	+0.31 [0.13-0.49]	-3.416 (<.001***)	-0.330	3.635	.021
	EG	4.03 (0.94)	4.06 (0.92)	+0.03 [-0.18-0.25]	-0.326 (.746)	-0.041	(.058)	
AS5	CG	3.83 (1.06)	3.93 (1.07)	+0.10 [-0.10-0.30]	-1.017 (.311)	-0.098	11.260	.063
	EG	4.34 (0.74)	3.89 (1.01)	-0.45 [-0.71--0.19]	3.492 (<.001***)	0.443	(<.001***)	
AS6	CG	3.96 (1.05)	3.79 (1.15)	-0.17 [-0.40-0.06]	1.421 (.158)	0.137	1.274	.008
	EG	4.47 (0.80)	4.10 (1.11)	-0.37 [-0.64--0.12]	2.892 (.005**)	0.367	(.261)	
AS8	CG	2.61 (1.20)	2.88 (1.24)	+0.27 [-0.04-0.58]	-1.721 (.088)	-0.166	0.157	.001
	EG	2.89 (1.13)	3.06 (1.00)	+0.17 [-0.12-0.48]	-1.183 (.241)	-0.150	(.693)	
AS9	CG	2.46 (1.06)	2.70 (1.08)	+0.24 [0.01-0.48]	-2.061 (.042*)	-0.199	2.339	.014
	EG	2.88 (1.06)	2.82 (1.06)	-0.06 [-0.39-0.27]	0.377 (.707)	0.048	(.128)	
AS12	CG	2.24 (1.30)	2.14 (1.23)	-0.10 [-0.34-0.14]	0.852 (.396)	0.082	0.791	.005
	EG	2.05 (1.22)	2.13 (1.19)	+0.08 [-0.27-0.44]	-0.464 (.644)	-0.059	(.375)	
AS13	CG	2.95 (1.16)	3.00 (1.28)	+0.05 [-0.22-0.31]	0.348 (.729)	-0.034	0.004	.000
	EG	3.18 (1.23)	3.21 (1.24)	+0.03 [-0.34-0.40]	-0.169 (.866)	-0.021	(.947)	

* = p<.05, ** = p<.01, *** = p<.001

Note. SD = Standard deviation, CG = Control Group, EG = Experimental Group, 95% CI = 95% confidence interval for difference, ASE = Academic Self-Efficacy-Total score, AS–AO = Academic Stress-Subscale 1 Academic Obligations, AS1 = Academic Stress-Item 1 (Sitting Exams), AS5 = Academic Stress-Item 5 (Academic Overload, AS6 = Academic Stress-Item 6 (Lack of time to complete academic tasks), AS8 = Academic Stress-Item 8 (Complete assignments to pass courses), AS9 = Academic Stress-Item 9 (The task of studying), AS12 = Academic Stress-Item 12 (Being able to go to every class), AS13 = Academic Stress–Item 13 (Too many commitments to be able to fulfil all academic obligations).

Study Techniques/Learning Strategies Intervention

Table 3. *Study Techniques/Learning Strategies Intervention. Descriptive statistics at pretest and posttest, Student's t-test, ANOVA F and effect sizes*

Variable	Group	Pretest Mean (*SD*)	Posttest Mean (*SD*)	Pre-Post Difference [95% CI]	Student's t (p value)	Effect size (Cohen's d)	ANOVA F (*p* value) Intra-Inter Interaction	Partial η^2
ASE	CG	33.73 (4.78)	35.67 (5.66)	+1.94 [1.18-2.70]	-5.044 (<.001***)	-0.488	7.224	.038
	EG	31.19 (4.62)	34.88 (5.06)	+3.69 [2.59-4.79]	-6.677 (<.001***)	-0.756	(.008**)	
AS-AO	CG	3.08 (0.70)	3.18 (0.78)	+0.10 [-0.03-0.23]	-1.516 (.133)	-0.147	3.167	.017
	EG	3.41 (0.59)	3.32 (0.68)	-0.09 [-0.23-0.07]	1.046 (.299)	0.118	(.077)	
AS1	CG	3.52 (0.98)	3.83 (1.01)	+0.31 [0.13-0.49]	-3.416 (<.001***)	-0.330	5.222	.028
	EG	4.10 (0.88)	4.11 (0.91)	+0.01 [-0.16-0.19]	-0.174 (.862)	-0.020	(.023*)	
AS5	CG	3.83 (1.06)	3.93 (1.07)	+0.10 [-0.10-0.30]	-1.017 (.311)	-0.098	10.729	.055
	EG	4.35 (0.79)	3.95 (1.04)	-0.40 [-0.62--0.17]	3.517 (<.001***)	0.398	(.001**)	
AS6	CG	3.96 (1.05)	3.79 (1.15)	-0.17 [-0.40-0.07]	1.421 (.158)	0.137	0.654	.003
	EG	4.41 (0.81)	4.11 (1.04)	-0.30 [-0.55-0.05]	2.417 (.018*)	0.274	(.453)	
AS8	CG	2.61 (1.20)	2.88 (1.24)	+0.27 [-0.04-0.58]	-1.721 (.088)	-0.166	0.288	.002
	EG	2.88 (1.08)	3.04 (1.07)	+0.16 [-0.12-0.43]	-1.126 (.264)	-0.127	(.592)	
AS9	CG	2.46 (1.06)	2.70 (1.08)	+0.24 [0.01-0.48]	-2.061 (.042*)	-0.199	3.500	.019
	EG	2.80 (0.95)	2.70 (1.03)	-0.10 [-0.38-0.18]	0.710 (.480)	0.080	(.063)	
AS12	CG	2.24 (1.30)	2.14 (1.23)	-0.10 [-0.34-0.14]	0.852 (.396)	0.082	1.773	.010
	EG	1.99 (1.16)	2.15 (1.16)	+0.16 [-0.17-0.50]	-0.985 (.328)	-0.111	(.185)	
AS13	CG	2.95 (1.16)	3.00 (1.28)	+0.05 [-0.22-0.31]	-0.348 (.729)	-0.034	0.499	.003
	EG	3.31 (1.24)	3.21 (1.15)	-0.10 [-0.44-0.23]	0.613 (.541)	0.069	(.481)	

* = $p<.05$, ** = $p<.01$, *** = $p<.001$

Note. SD = Standard deviation, CG = Control Group, EG = Experimental Group, 95% CI = 95% confidence interval for difference, ASE = Academic Self-Efficacy-Total score, AS–AO = Academic Stress-Subscale 1 Academic Obligations, AS1 = Academic Stress-Item 1 (Sitting Exams), AS5 = Academic Stress-Item 5 (Academic Overload, AS6 = Academic Stress-Item 6 (Lack of time to complete academic tasks), AS8 = Academic Stress-Item 8 (Complete assignments to pass courses), AS9 = Academic Stress-Item 9 (The task of studying), AS12 = Academic Stress-Item 12 (Being able to go to every class), AS13 = Academic Stress–Item 13 (Too many commitments to be able to fulfil all academic obligations).

Study Techniques/Learning Strategies Intervention

As can be seen from Table 3, there is a significant increase in ASE in both groups (EG [*n* = 78] and CG [*n* = 107]) from pretest to posttest, albeit the effect is greater for EG (-0.756) than for CG (-0..488). For Items AS5 *Academic Overload* and AS6 *Lack of time to complete academic tasks*, the EG experienced a significant reduction following the intervention, whilst there was no change in the CG. For Items AS1 *Sitting exams* and AS9 *The task of studying*, the CG reflected a significant increase between pretest and posttest, whilst in the EG there were no significant changes over that interval. For the remaining items, no significant changes were observed between pretest and posttest in either group.

The results from ANOVA show significant effects in ASE [*F* (1,183) = 7.224, *p* =.008, partial η^2 = .038] and for Items AS1 *Sitting Exams* [*F* (1,183) = 5.222, *p* <.023, partial η^2 = .028] and AS5 *Academic Overload* [*F* (1,183) = 10.729, *p* <.001, partial η^2 =.055] explained by the interaction of intrasubject (time of testing) and intersubject (between groups) factors. For the remaining AS items there were no significant effects explained by such interaction.

Exam Preparation Intervention

As can be seen from Table 4, there is a significant increase in ASE in both groups (EG [*n* = 57] and CG [*n* = 107]) from pretest to posttest, albeit the effect is greater for EG (-0.793) than for CG (-0..488). For Item AS5 *Academic Overload* in the EG there was a significant reduction following the intervention, whilst there was no change in the CG. For Items AS1 *Sitting exams* and AS9 *The task of studying*, the CG had a significant increase between pretest and posttest, whilst in the EG there were no significant changes over that interval. For the remaining items, no significant changes were observed between pretest and posttest in either group.

The results from ANOVA show significant effects in ASE [F (1,162) = 6.609, p =.011, partial η2 = .039] and for Items AS1 *Sitting Exams* [F (1,162) = 4.566, p = .034, partial η2 = .027] and AS5 *Academic Overload* [F (1,162) = 5.575, p =.019, partial η2 =.031] and AS9 *The task of studying* [F (1,162) = 5.257, p =.023, partial η^2 .031] explained by the interaction of intrasubject (time of testing) and intersubject (between groups) factors. For the remaining AS items there were no significant effects explained by such interaction.

Table 4**.** *Exam Preparation Intervention. Descriptive statistics at pretest and posttest, Student's t-test, ANOVA F and effect sizes*

Variable	Group	Pretest Mean (*SD*)	Posttest Mean (*SD*)	Pre-Post Difference [95% CI]	Student's t (p value)	Effect size (Cohen's d)	ANOVA F (*p* value) Intra-Inter Interaction	Partial η^2
ASE	CG	33.73 (4.78)	35.67 (5.66)	+1.94 [1.18-2.70]	-5.044 (<.001***)	-0.488	6.609	.039
	EG	31.20 (4.89)	34.93 (5.73)	+3.73 [2.48-4.98]	-5.988 (<.001***)	-0.793	(.011*)	
AS-AO	CG	3.08 (0.70)	3.18 (0.78)	+0.10 [-0.03-0.23]	-1.516 (.133)	-0.147	2.896	.018
	EG	3.42 (0.67)	3.32 (0.70)	-0.10 [-0.29-0.10]	0.983 (.330)	0.130	(.091)	
AS1	CG	3.52 (0.98)	3.83 (1.01)	+0.31 [0.13-0.49]	-3.416 (<.001***)	-0.330	4.566	.027
	EG	4.04 (0.98)	4.04 (0.96)	0.00 [-0.21-0.21]	0.000 (1.000)	0.000	(.034*)	
AS5	CG	3.83 (1.06)	3.93 (1.07)	+0.10 [-0.10-0.30]	-1.017 (.311)	-0.098	5.575	.033
	EG	4.32 (0.83)	4.02 (0.99)	-0.30 [-0.57--0.03]	2.214 (.031*)	0.293	(.019*)	
AS6	CG	3.96 (1.05)	3.79 (1.15)	-0.17 [-0.40-0.07]	1.421 (.158)	0.137	0.059	.000
	EG	4.37 (0.86)	4.16 (1.00)	-0.21 [-0.53-0.10]	1.375 (.175)	0.182	(.808)	
AS8	CG	2.61 (1.20)	2.88 (1.24)	+0.27 [-0.04-0.58]	-1.721 (.088)	-0.166	0.061	.000
	EG	2.89 (1.01)	3.11 (0.99)	+0.22 [-0.11-0.53]	-1.334 (.188)	-0.177	(.805)	
AS9	CG	2.46 (1.06)	2.70 (1.08)	+0.24 [0.01-0.48]	-2.061 (.042*)	-0.199	5.257	.031
	EG	2.92 (1.08)	2.70 (0.99)	-0.22 [-0.57-0.12]	1.315 (.194)	0.174	(.023*)	
AS12	CG	2.24 (1.30)	2.14 (1.23)	-0.10 [-0.34-0.14]	0.852 (.396)	0.082	0.127	.001
	EG	2.13 (1.28)	2.11 (1.17)	-0.02 [-0.47-0.43]	0.089 (.930)	0.012	(.722)	
AS13	CG	2.95 (1.16)	3.00 (1.28)	+0.05 [-0.22-0.31]	-0.348 (.729)	-0.034	0.501	.003
	EG	3.26 (1.26)	3.14 (1.27)	-0.12 [-0.55-0.30]	0.578 (.566)	0.077	(.480)	

* = p<.05, ** = p<.01, *** = p<.001

Note. SD = Standard deviation, CG = Control Group, EG = Experimental Group, 95% CI = 95% confidence interval for difference, ASE = Academic Self-Efficacy-Total score, AS–AO = Academic Stress-Subscale 1 Academic Obligations, AS1 = Academic Stress-Item 1 (Sitting Exams), AS5 = Academic Stress-Item 5 (Academic Overload, AS6 = Academic Stress-Item 6 (Lack of time to complete academic tasks), AS8 = Academic Stress-Item 8 (Complete assignments to pass courses), AS9 = Academic Stress-Item 9 (The task of studying), AS12 = Academic Stress-Item 12 (Being able to go to every class), AS13 = Academic Stress–Item 13 (Too many commitments to be able to fulfil all academic obligations).

Finally, the correlation between the number of sessions (group and one-to-one) attended by students in the three experimental groups and levels of AS and ASE at posttest. None of the values was statistically significant.

Discussion and Conclusions

The objective of this study is to assess the effectiveness of an intervention to teach study and learning skills to reduce academic stress and increase academic self-efficacy in Nursing students in their first term at a Spanish university. Following the intervention, the results showed improvements in those areas in the experimental group. Those improvements were sustained over students' first academic year.

In a recent systematic review (Chust et al., 2023) interventions to help university students to reduce their AS in the absence of other types of stress (perceived, financial, etc.) were reviewed. As stated above, only the effectiveness of an intervention to develop study skills (Baumgartner & Schneider, 2021) was analysed and no reduction in AS was found following a seven-week intervention. However, our results are not consistent with that study. In relation to ASE, our findings are consistent with the results of other studies that found a positive impact from study skills interventions (Charbonnier et al., 2023; Fung et al., 2021) and inconsistent with studies that found no effectiveness (Foulstone & Kelly, 2019; Yang et al., 2022).

Specifically, ANOVA showed that the TM intervention was effective to increase ASE and reduce AS caused by academic overload. Student's t-tests also revealed that following the intervention, the experimental group felt less stress from lack of time to complete academic tasks, whilst in the control group that stress did not decrease. Those tests showed an increase in the control group of stress caused by sitting exams and the task of studying, whilst that increase was not seen in the experimental group. Those findings are not surprising in light of the many studies that have found a relationship between time management and academic stress (Abojedi et al., 2023; Ahmady et al., 2021) and with academic self-efficacy (Ersoy & Peker, 2020; Kordzanganeh et al., 2022) in university students. In fact, students who manage their time well, planning and organising themselves, are more productive (Sagredo et al., 2020), so enabling them to complete academic tasks on time and in turn reduce their stress. That improved productivity also translates into better academic achievement and a greater sense of academic competence in the face of subsequent tasks (Ersoy & Peker, 2020).

For the SS/LS intervention, ANOVA showed the effectiveness of the intervention in increasing ASE and reducing stress from sitting exams and academic overload. Student's t-tests also revealed that following the intervention, the experimental group felt less stress from lack of time to complete academic tasks, whilst in the control group that stress did not decrease. Finally, in the control group there was an increase in the stress caused by the task of studying, whilst that increase was not seen in the experimental group. Self-regulated learning and the use of learning strategies were a negative predictor of AS (De la Fuente-Arias & Amate-Romera, 2019; Yang et al., 2019) and a positive predictor of ASE (Sotardi & Brogt, 2020; Wang, 2023). Students who self-regulate in their learning processes using specific strategies bring to bear resources and skills that improve their perceptions of their self-efficacy (Sotardi & Brogt, 2020; Wang, 2023). In fact, it has been shown that students with higher levels of self-regulation in their learning appear to be better equipped for the demands of university study, because they implement strategies for coping with stress that use positive re-evaluation and focus on problem-solving (managing and planning personal resources) and avoid emotion-based strategies (De la Fuente-Arias & Amate-Romera, 2019; Vega-Martínez et al., 2023). In that way, they avoid ineffective approaches which themselves generate AS (Céspedes & Tamayo, 2022). Alignment of learning and evaluation, fruit of self-regulated learning in students, may make less likely that students will experience worry and stress in connection with the demands of university study (Sotardi & Brogt, 2020).

Finally, in relation to the EP intervention, ANOVA showed that it was effective in improving ASE and in reducing stress caused by sitting exams, academic overload and the task of studying. We did not find any studies that observed an association between specific preparation for multiple-choice, essay and short answer exams with AS and ASE. However, it would be reasonable to think that increased skill in addressing the demands of each type of exam (the most common ones for the course followed by the sample, especially multiple-choice papers) would increase self-perceived academic competence and reduce AS from sitting exams. According to our results, such training would also reduce stress from the task of studying, which would not be the case with the ST/LS intervention. This finding (which is certainly intriguing) indicates that knowing how to do exams could be more advantageous in terms of reducing stress from the task of studying for exams, than knowing how to prepare for exams. Those results may also be due to students already knowing some of the content of the ST/LS intervention. It is known that many secondary schools and vocational education insti-

tutions teach study skills. However, the students in the sample may be less familiar with the content of the EP intervention. Many secondary school students feel less capable of taking multiple-choice exams relative to essay style papers (Reiné-Díez & Fernández-Ramos, 2016; Vergara et al., 2019), because multiple-choice papers are not often used in secondary education, such that the students in our sample (mostly school-leavers) may feel less well-prepared for, and more stressed by, multiple-choice exams. Hence the greater value of the EP intervention in helping to reduce their stress when preparing for future exams over the ST intervention, which specifically addresses study techniques.

The stress caused by academic overload (having a lot of assignments and tasks) was reduced in the three interventions. However, none of the interventions was effective in reducing stress from a lack of time to complete academic tasks. It therefore seems that following the intervention the students are less affected by high levels of academic demand, but continue to perceive that they do not have enough time to meet all those demands. Stress from doing compulsory tasks and from being able to attend every class was similarly unaffected by any of the interventions. That is a reasonable finding, because none of the three addressed those issues. Finally, the stress caused by having too many commitments to be able to fulfil all academic obligations was similarly unaffected by the intervention. Under Big Five theory (Goldberg, 1990), conscientiousness is one of the five core personality traits and so in principle less susceptible to modification.

Finally, no association was found between the number of sessions attended and scores for AS and ASE. Those results suggest that the number of sessions attended does not impact the effectiveness of the intervention. Along those lines, a recent systematic review found that the duration of academic stress interventions is not determinative of their effectiveness (Chust et al., 2023). This finding may be explained by the fact that AS and ASE are subjective, such that when a person feels that they have acquired sufficient study skills, their stress will go down and their self-efficacy will go up. For such learning, some students may need more sessions than others because they have different baseline levels of AS, ASE and study skills. However, the required greater clarity will depend on future studies.

Limitations and future lines of research

The findings of this study must be seen in the context of its limitations. First, the sample was drawn from a single course at a single university, which limits the scope to generalise

the results. Future studies could examine students following other courses and at other universities to make the results more generalisable. In addition, although the comparison groups were essentially similar (students following the same course with similar general characteristics), they had different pretest scores: the scores of the experimental groups were generally lower for ASE and higher for the AS group than for the control group. A possible explanation is that the interventions in this study (carried out annually) are generally attended by students who feel less confident and more stressed about their academic work. Those who feel more competent tend to come less. In addition, the intervention was not the same for all participants. Attendance for the three interventions was voluntary, so that for each of the three interventions (TM, ST/LS and EP) the experimental group contained students who went to group sessions, students who had (more or fewer) one-to-one sessions and students who went to both types of sessions. In the university context of the study, it is not possible to devise an intervention of this nature that would be uniform for all first-year students. With the aim of overcoming that limitation, the independent variables were defined as described under Material and Methods above. The fact, also, that the sample for the experimental groups for the three independent variables was small meant that it was not practicable to use finer distinction in forming the groups. That would have made those groups even smaller and prevented the use of multivariate statistical models. As such, it is not possible to know whether the effectiveness of the interventions is greater for the group sessions or one-to-one sessions, or whether the number of one-to-one sessions is determinative. Future studies with larger samples may be able to shed light here.

Finally, this study only considered a single intervention provided to the individual. Recent models in educational psychology, such as Self-Regulation vs External Regulation of Learning theory (De la Fuente-Arias, 2017) suggest that AS has many causes, and depends on the interaction of internal characteristics with features of the environment (resources provided by a university, academic support from peers...) and issues around teaching staff (teaching methods, degree of enthusiasm, communication with students, academic demand...). The impact of other factors on AS has been shown in a range of studies (Arribas, 2013; Knoster & Goodboy, 2020; Souto-Gestal et al., 2019). As such, it is necessary to develop a more interactive understanding of AS and therefore interventions to reduce or prevent AS. Although the intervention in this study has been shown to be effective in reducing in AS, effect sizes are generally small. It is possible that if measures focused on controlling contextual and teaching variables were added to interventions provided to individuals, the reduction in AS would be

greater. It would be interesting to study the effectiveness of such multi-component interventions, in order to improve the teaching-learning process and the mental health of first-year university students.

Although it is not possible to completely eliminate stress in university students, it can be minimised (Arribas, 2013; Shudifat & Al-Husban, 2015). Consequently, so that universities can provide high-quality degree courses, they should eliminate sources of stress that affect their students, so as to optimise teaching-learning processes. We can conclude that an intervention to teach study skills (Time Management, Study Techniques/Learning Strategies, and Exam Preparation) was effective in reducing academic stress and increasing academic self-efficacy in first-year students in the sample, and that those improvements were sustained over the whole first year. Those findings suggest that short study skills interventions should be seen as effective measures to reduce academic stress and increase academic self-efficacy in newly admitted university students. Universities could thus provide guidance and educational psychiatric or psychological support programmes to support them in coping with the demands of university study, minimise the impact of stressors and increase feelings of academic competence in students.

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