



## Research paper

# Burnout and posttraumatic stress in paediatric critical care personnel: Prediction from resilience and coping styles

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## ABSTRACT

**Introduction:** Our aims were (1) to explore the prevalence of burnout syndrome (BOS) and posttraumatic stress disorder (PTSD) in a sample of Spanish staff working in the paediatric intensive care unit (PICU) and compare these rates with a sample of general paediatric staff and (2) to explore how resilience, coping strategies, and professional and demographic variables influence BOS and PTSD.

**Materials and Methods:** This is a multicentre, cross-sectional study. Data were collected in the PICU and in other paediatric wards of nine hospitals. Participants consisted of 298 PICU staff members (57 physicians, 177 nurses, and 64 nursing assistants) and 189 professionals working in non-critical paediatric units (53 physicians, 104 nurses, and 32 nursing assistants). They completed the Brief Resilience Scale, the Coping Strategies Questionnaire for healthcare providers, the Maslach Burnout Inventory, and the Trauma Screening Questionnaire.

**Results:** Fifty-six percent of PICU working staff reported burnout in at least one dimension (36.20% scored over the cut-off for emotional exhaustion, 27.20% for depersonalisation, and 20.10% for low personal

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accomplishment), and 20.1% reported PTSD. There were no differences in burnout and PTSD scores between PICU and non-PICU staff members, either among physicians, nurses, or nursing assistants. Higher burnout and PTSD rates emerged after the death of a child and/or conflicts with patients/families or colleagues. Around 30% of the variance in BOS and PTSD is predicted by a frequent usage of the emotion-focused coping style and an infrequent usage of the problem-focused coping style.

*Discussion and Conclusions:* Interventions to prevent and treat distress among paediatric staff members are needed and should be focused on: (i) promoting active emotional processing of traumatic events and encouraging positive thinking; (ii) developing a sense of detached concern; (iii) improving the ability to solve interpersonal conflicts, and (iv) providing adequate training in end-of-life care.

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## 1. Introduction

Paediatric intensive care staff experience a very demanding environment day to day in which they are continuously exposed to traumatic events, changing and stressful situations, and children and families suffering. Research aiming at studying mental health among intensive care staff is scarce; however, studies published to date agree that they show rates of work-related stress so high that they have reached epidemic levels.<sup>1</sup>

The most explored outcome in healthcare providers has been burnout syndrome (BOS). It was initially defined in the 1970s as a state of fatigue or frustration that resulted from professional relationships that failed to produce the expected rewards.<sup>2</sup> Maslach et al later defined BOS as an inappropriate response to chronic work stress (especially interpersonal) that involved three dimensions: emotional exhaustion (EE; the feeling of being over-extended and depleted of resources, representing the basic individual stress dimension of burnout), depersonalisation (DP; a cynical and distant attitude towards one's work and the people one works with), and a diminished sense of personal accomplishment (the tendency to evaluate one's achievements at work negatively).<sup>3–5</sup> The three-dimensional structure of BOS has been confirmed in different studies.<sup>6,7</sup> Clinical burnout symptoms are non-specific and include tiredness, headaches, eating problems, insomnia, irritability, emotional instability, and rigidity in relationships with other people.<sup>8</sup> BOS occurs among various professionals who work with other people in challenging situations, especially in helping professions (e.g., physicians, nurses, teachers, and police officers). It has mostly been studied among healthcare providers, such as nurses and physicians.<sup>3</sup>

Considering that critical care healthcare workers deal with an especially high-risk context (they must encounter patients who are critically ill, care for unstable patients, carry out procedures accurately, react to extremely urgent matters, support the families when the patient dies,<sup>9</sup> etc.), it is not surprising that studies consistently find high levels of BOS in this population.<sup>1</sup> Two studies conducted in adult intensive care units (ICUs) in France have found that around 50% of physicians<sup>10</sup> and 30% of nursing staff reported BOS.<sup>11</sup> A study conducted in Spain showed lower rates, with 16% of nurses, 14% of resident doctors, 13% of physicians, and 10% of nursing assistants reporting BOS.<sup>12</sup> In the context of paediatric intensive care units (PICUs), findings have been similar. A study conducted in a PICU in the UK found that 61% of physicians and nurses showed high rates of burnout in at least one of its three dimensions,<sup>13</sup> and a more recent study found a prevalence of 37%.<sup>14</sup> In a study conducted in Argentina, the BOS rate in PICU physicians was 41%,<sup>16</sup> and in the United States, it was nearly 50%.<sup>16</sup> The overall view emerging from these studies is that in different countries the rates of psychological impairment in intensive care clinicians is alarmingly high. This can have many negative consequences, as burnout is associated with diminished work effectiveness,<sup>4</sup>

decreased quality of care,<sup>17,18</sup> poor communication with the families,<sup>17,19</sup> and costs related to absenteeism, all of which have particularly devastating consequences in the PICU.

A less studied psychological consequence in ICU and PICU staff is posttraumatic stress disorder (PTSD) even though it is the most commonly explored outcome in people who have faced traumatic situations. PTSD occurs as a consequence of the exposure to an event which is a threat to an individual's life or to the life of a close family member or friend. Furthermore, it may result from specific circumstances under which the individuals are repeatedly exposed to intense adverse situations,<sup>20</sup> such as professionals exposed to people who have suffered traumatic events (e.g., emergency personnel). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition,<sup>21</sup> a PTSD diagnosis requires symptoms of at least 1 month's duration that have a significant impact on social and occupational functioning and that are not the result of either another medical condition or the effect of substances. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, identifies four symptom clusters that characterise PTSD: intrusive symptoms, avoidance, disturbed emotional states, and alterations of arousal and reactivity.<sup>21</sup> A meta-analytic review found that 14.8% of physicians reported PTSD, this prevalence being greater than in the general population.<sup>22</sup> A study conducted in an ICU in the United States found that 24% of nursing staff reported PTSD, and that this rate is higher than in staff members from other units.<sup>23</sup> A study conducted in Singapore found that 33% of ICU staff suffered from significant PTSD symptoms.<sup>24</sup> Focusing on the PICU, Colville et al.<sup>13</sup> found that 18% of staff members showed clinically significant symptoms of PTSD.

Considering the high occurrence of BOS and PTSD among PICU working staff, it is crucial to study which factors contribute to or can prevent the development of burnout and PTSD. Resilience, defined as the process of positive adaptation despite experiences of significant adversity,<sup>25</sup> has emerged as a protective factor for psychological disorders among intensive care staff members.<sup>13,14,26,27,28</sup> Additionally, certain coping strategies have been associated with lower risk for burnout and PTSD. Individuals who chose to “keep busy” reported higher rates of burnout and those who regularly chose to “ignore stress” at work showed higher PTSD. In contrast, those who try to find benefits and learning in their work reported the lowest rates of psychological impairment.<sup>13,14</sup> A study that aimed at exploring the mechanism by which resilience acts as a protective factor found high-resilient intensive care nurses use different coping strategies (more cognitive flexibility, optimism and higher social support) than those who report PTSD,<sup>25</sup> which suggests a relationship between resilience and coping strategies.

Additionally, some demographic variables are related to distress. Some studies have found no association of sociodemographic variables with mental health,<sup>6</sup> while others found that women,<sup>10</sup> younger professionals,<sup>11,15,29</sup> and divorced/separated

individuals<sup>29</sup> are at increased risk. Finally, some environmental variables such as the number of night shifts the week before, time since last vacations, and conflicts with colleagues are associated with higher burnout. No associations have been found with patient-related variables, such as their severity or mortality.<sup>10,12,30</sup>

Given the high rates of burnout and PTSD in PICU staff found in previous studies, combined with the lack of information regarding which variables are related to distress in that sample, this study attempts:

- (1) To discern the prevalence of burnout and PTSD in PICU staff and to compare it with the prevalence of staff members working in other paediatric units.
- (2) To compare the rates of BOS and PTSD in physicians, nurses, and nursing assistants.
- (3) To explore the role of resilience and coping strategies in predicting burnout and PTSD.
- (4) To explore how burnout and PTSD are related to socio-demographic and work-related variables.

## 2. Methods

### 2.1. Procedure

This is a multicentre cross-sectional study. As no patients or families were involved in the data collection, the research ethics committee of the hospital that coordinated the study waived the need for approval. Participation was anonymous, and the data collected were confidential.

An individual from each of the nine hospitals who took part of the study was appointed for data collection. Participants were contacted by that individual in their workplace and were asked to fill out a set of questionnaires. The present study formed part of a larger project and therefore the questionnaire contained a range of instruments. In this study, the interest was in determining the prevalence of burnout and PTSD and its determinants.

### 2.2. Sample

Participants of this study were 298 staff members working in nine different PICUs (57 physicians, 177 nurses, and 64 nursing assistants) in Spain, and 189 staff members working in paediatrics in the same nine hospitals but not in PICU (53 physicians, 104 nurses, and 32 nursing assistants).

## 3. Materials

All the participants completed the following questionnaires.

- *Demographic questionnaire*: It assessed background characteristics including sex, age, marital status, and number of children.
- *Professional activity questionnaire*: including profession (physician, nurse, and nursing assistant), years of experience, number of night shifts the week before, patients deceased in the unit, conflicts with patients and colleagues the week before, number of days since the last day off, number of days worked in the last month, and wish to be transferred to another unit.
- *Brief Resilience Scale*<sup>25</sup>. This is a 6-item self-report scale with a 5-point Likert response scale, which assesses a person's self-report of their resilience, defined as the ability to recover from adversity and stress. The scores may range from 0 to 30, with higher scores indicating higher resilience. Scores are calculated as the sum of the item responses, after recoding its three inverse items. It has shown adequate internal consistency ( $\alpha = .80-.90$ ) and

test-retest reliability ( $r = 0.62-0.69$ ) and has been recommended on the basis of its psychometric properties.<sup>31</sup> The Spanish Brief Resilience Scale<sup>32</sup> showed adequate internal consistency ( $\alpha = .83$ ) and test-retest reliability (Intraclass Correlation Coefficient = .69) as well as adequate evidence of the scores' convergent, concurrent, and predictive validity.

- *Coping questionnaire for healthcare providers*. This questionnaire is an adaptation for healthcare providers of the Person-situation Coping Questionnaire for Adults.<sup>33</sup> It includes 16 items on a 5-point Likert scale to assess the frequency of usage of eight coping strategies divided into two factors: Problem-focused coping style and emotion-focused coping style. An exploratory factor analysis in our sample showed that the first factor ( $\alpha = .71$ ) included the strategies help-seeking, solution-seeking, and positive thinking, while the second ( $\alpha = .76$ ) included rumination, emotional expression, isolation, self-blaming, and avoidance. The eight strategies are assessed in two areas: problems related to colleagues and problems related to patients/families.
- *Maslach Burnout Inventory* (MBI<sup>4</sup>). This 22-item questionnaire assesses the frequency of occurrence of different feelings in relation to their job in the last week in a 7-point Likert scale. It contains three dimensions: EE, DP, and personal achievement (PA). A meta-analysis has shown an average internal consistency (Cronbach's  $\alpha$ ) of .88, .71, and .78, respectively, for each dimension,<sup>34</sup> including data from the Spanish MBI.<sup>31</sup> We used the Spanish translation by Seisdedos.<sup>35</sup> A study found that for the Spanish version, the Cronbach's  $\alpha$  was satisfactory for PA ( $\alpha = .71$ ) and EE ( $\alpha = .85$ ) and moderate for DP ( $\alpha = .58$ ).<sup>36</sup> Cut-off scores for EE are between 15 and 24 (the score is low if is below 15 and high if is up to 24), for DP between 4 and 9, and for PA between 33 and 39. As in the study by Colville,<sup>13</sup> we calculated the percentage of professionals scoring above the cut-off in each dimension and in any of the three dimensions.
- *Trauma Screening Questionnaire* (TSQ<sup>37</sup>). It is a 10-item measure with a yes-no response format that inquired about re-experiencing or arousal symptoms in the past week. Previous research has demonstrated that it has excellent performance relative to other PTSD screening instruments and that endorsement of six or more symptoms yields high levels of sensitivity and specificity for detecting PTSD.<sup>38</sup> As the TSQ was not available in the Spanish language, it was translated to Spanish. To do so, a native English-speaking bilingual translator translated the TSQ from English to Spanish. After that, two native Spanish speaking bilingual psychologists revised this translation independently and agreed on a final common translation. Finally, this version was back-translated (Spanish to English) by a different bilingual native Spanish-speaking psychologist to ensure the equivalence of the translation. In the present study, the Cronbach's  $\alpha$  was .79.

### 3.1. Data analysis

First, descriptive analyses were conducted to establish the prevalence of burnout dimensions and PTSD as well as Chi-square tests to compare the percentages of PICU and non-PICU workers reporting burnout and PTSD. Second, Analyses of Variance (ANOVAs) were conducted to explore the differences in the scores among groups. Third, correlations between resilience and coping with burnout dimensions and PTSD were calculated. Fourth, the total sample ( $N = 487$ ) was randomly divided into two groups, one for testing the model ( $n_1 = 244$ ) and the other for cross-validation ( $n_2 = 243$ ). A path analysis with latent variables (PALV) was then conducted on the first randomised subsample using AMOS 22 to

study the effect of coping and resilience in predicting distress. In order to assess model fit, absolute fit indexes ( $\chi^2/df$ , goodness of fit index), relative fit indexes (incremental fit index) and non-centrality fit indexes (comparative fit index, root mean square error of approximation, and standardised root mean square residual [SRMR]) were used, as well as criteria for acceptance or rejection described by Hair et al.<sup>39</sup> (ratio  $\div 2/df < 5$ ; SRMR  $< .08$ ; root mean square error of approximation  $< .08$ ; goodness of fit index, comparative fit index, and incremental fit index  $> .90$ ). Fifth, a cross-validation analysis using both randomised subsamples was conducted to test the invariance of the model (that is, to test whether the model works equally in both subsamples). Finally, a multiple group analysis (MGA) was conducted to compare how the model works for PICU and non-PICU staff.

## 4. Results

### 4.1. Sample descriptive data

Demographic data concerning professional activity for the sample of PICU staff and for the sample of paediatric but non-PICU staff are presented in Table 1. More than 80% of the professionals were women. The best represented group was nurses (more than 50%). Having conflicts with colleagues was more frequent for PICU (12.5%) than for non-PICU staff (7%), while having conflicts with patients or families was more frequent for non-PICU (10.8%) than for PICU staff (4.1%). The death of a patient the week before had occurred eight times more frequently in the PICU than in other paediatric wards. The percentage of professionals who would like to be transferred to other unit was 26.1% for PICU staff and 17.7% for non-PICU staff.

### 4.2. Prevalence of burnout and PTSD

The proportions of the sample of PICU staff scoring in the ranges deemed indicative of high burnout for the three dimensions measured by the MBI were 36.20% for EE (over the cutoff of 24), 27.20% for DP (over the cutoff of 9) and 20.10% for lack of PA (below the cutoff of 33), with 56% of the PICU workers reporting burnout on at least one dimension. In addition, 20.1% of PICU working staff reported PTSD (endorsement of six or more symptoms in the TSQ).

**Table 1**  
Demographic and professional characteristics of the sample.

Demographics	PICU	No-PICU
Gender (% women)	82.6	84.1
Marital status (%)		
Single	46.6	43.4
Married	46.6	47.6
Divorced	4.7	7.4
Widow	2	1.6
Having children (%)	50	56.6
Age (mean/SD)	40.20 (9.25)	44.12 (11.24)
<b>Data concerning professional activity</b>		
Profession (%)		
Physician	19.1	28
Nurse	59.4	55
Nursing assistant	21.5	16.9
Conflict with colleagues last week (%)	12.5	7
Conflict with patients last week (%)	4.1	10.8
Desire to be transferred to another unit (%)	26.1	17.7
Years of experience (mean/SD)	16.18 (8.38)	20.56 (11.62)
N. of night shifts in previous week (mean/SD)	1.60 (1.23)	1.25 (1.31)
N. of days since last day off (mean/SD)	3.12 (2.71)	3.84 (3.76)
N. of days worked last month (mean/SD)	18.52 (3.76)	19.27 (4.09)
N. of deaths last week (mean/SD)	0.56 (0.86)	0.07 (0.30)

PICU = paediatric intensive care unit; SD = standard deviation; N. = number.

**Table 2**

Prevalence of burnout, burnout dimensions, and posttraumatic stress disorder (PTSD) for PICU and non-PICU staff and chi-square tests.

Variable		PICU (%)	No-PICU (%)	Chi-square test (p)
EE	High	36.20	34.40	.785
	Medium	37.60	40.70	
	Low	26.20	24.90	
DP	High	27.20	27.50	.953
	Medium	38.90	37.60	
	Low	33.90	34.90	
PA	High	<b>47.70</b>	<b>60.80</b>	<b>.004</b>
	Medium	<b>32.20</b>	<b>19</b>	
	Low	<b>20.10</b>	<b>20.10</b>	
Burnout	Yes	56	51.90	.366
	No	44	48.10	
PTSD	High	20.10	18.50	.376
	Not high	79.90	81.50	

PICU = paediatric intensive care unit; EE = emotional exhaustion; DP = depersonalisation; PA = personal achievement. Significant differences are marked in bold.

As chi-square tests presented in Table 2 showed, there was no statistically significant difference between PICU and non-PICU staff in their percentages of burnout and PTSD. The only significant difference was for PA; the same percentage of individuals in both groups reported low PA (scores below 33), but a larger percentage of non-PICU workers reported high PA (scores over 39).

### 4.3. Influence of demographic and professional variables on burnout and PTSD levels

As Table 3 shows, there were no differences in the scores for the three dimensions of burnout and in PTSD scores between staff members working in PICU and staff members working in another paediatric unit. Also, burnout and PTSD scores were irrespective of discipline. However, EE and PTSD scores were higher when one or more patients had died in the unit or conflicts with work colleagues had occurred the week before. Having had conflict with families/patients the previous week and the wish to be transferred to a different unit were related to higher EE, DP, and PTSD scores.

None of the demographic variables assessed were related to the degree in which staff members scored in burnout or PTSD. Additionally, years of experience, number of days since the last day off, number of days worked during the previous month, and number of night shifts in the week before were not related to burnout and PTSD levels.

### 4.4. Correlations between coping and resilience with burnout and PTSD

Correlations between coping and resilience with burnout dimensions and PTSD calculated for the whole sample are presented in Table 4. Resilience showed a moderate inverse correlation with emotional exhaustion and PTSD, a smaller but also inverse correlation with DP, and a weak but direct correlation with PA. The emotion-focused coping style was moderately correlated with higher EE, DP, and PTSD and weakly correlated to lower PA. Self-isolation, EE, and self-blame were related to EE, DP, PTSD, and PA in the same way as emotion-focused coping. The problem-focused coping style was moderately and directly correlated to PA, not related to PTSD and inversely and weakly correlated to EE and DP. Positive thinking was strongly associated with higher PA and inversely correlated to EE, DP, and PTSD. However, help seeking was significantly and weakly correlated only with EE (inversely) and with PA (directly). As for resilience, it was strongly and inversely related with the emotion-focused coping style, while the correlation between resilience and problem-focused coping style was weak and direct.

**Table 3**  
Effect of demographic and profession-related variables on burnout and posttraumatic stress. ANOVAs.

Demographic/profession related variable		Burnout			PTSD
		EE	DP	PA	
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<i>Demographic data</i>					
Gender	Women	21.37 (9.21)	6.23 (4.57)	38.23 (6.81)	3.03 (2.70)
	Men	21.15 (9.57)	6.59 (5.32)	38.74 (6.86)	2.79 (2.43)
Relationship status	With a couple	22.00 (9.09)	6.17 (4.46)	37.72 (7.37)	3.07 (2.74)
	Without	20.74 (9.39)	6.40 (4.92)	38.85 (6.23)	2.92 (2.57)
Having children	Yes	21.95 (9.44)	6.14 (4.40)	38.54 (7.09)	2.96 (2.64)
	No	20.64 (9.02)	6.46 (5.02)	38.06 (6.49)	3.02 (2.67)
<i>Data concerning professional activity</i>					
Working in PICU	Yes	21.16 (9.20)	6.28 (4.67)	38.04 (6.28)	3.10 (2.66)
	No	21.59 (9.37)	6.30 (4.77)	38.75 (7.55)	2.81 (2.63)
Profession	Physician	20.74 (9.01)	6.00 (4.63)	38.78 (6.10)	2.92 (2.43)
	Nurse	21.74 (9.17)	6.41 (4.56)	37.74 (6.88)	3.12 (2.76)
	N. assistant	20.80 (9.82)	6.26 (5.20)	38.47 (7.21)	2.70 (2.57)
Any death last week	Yes	<b>23.43 (9.19)**</b>	6.92 (5.10)	37.69 (6.68)	<b>3.88 (2.69)***</b>
	No	<b>20.65 (9.19)</b>	6.08 (4.56)	38.52 (6.84)	<b>2.70 (2.58)</b>
Conflict colleagues	Yes	<b>23.82 (9.56)*</b>	6.86 (5.05)	38.68 (5.55)	<b>3.92 (2.87)**</b>
	No	<b>21.00 (9.20)</b>	6.20 (4.65)	38.30 (6.97)	<b>2.86 (2.61)</b>
Conflict patient/family	Yes	<b>25.63 (9.30)**</b>	<b>8.69 (5.54)**</b>	36.91 (6.77)	<b>4.34 (3.00)**</b>
	No	<b>20.96 (9.30)</b>	<b>6.08 (4.59)</b>	38.43 (6.83)	<b>2.88 (2.61)***</b>
Wish to change	Yes	<b>26.49 (8.68)***</b>	<b>7.84 (5.15)***</b>	37.94 (6.28)	<b>3.98 (2.76)***</b>
	No	<b>19.58 (8.71)</b>	<b>5.79 (4.48)</b>	38.56 (6.98)	<b>2.64 (2.55)</b>

EE = emotional exhaustion; DP = depersonalisation; PA = personal achievement; PICU = paediatric intensive care unit; PTSD = posttraumatic stress disorder; SD = standard deviation.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ . Significant differences are marked in bold.

**Table 4**  
Pearson correlations between resilience, coping strategies/styles, and demographic and work variables with psychological outcomes (N = 487).

Variable	Resilience	EE	DP	PA	PTSD
Resilience		-.351***	-.142**	.144***	-.358***
Emotion-focused coping	-.407***	.361***	.252***	-.163***	.399***
Rumination	-.338***	.171***	.124**	-.021	.251***
Thinking-avoidance	-.185***	.237***	.130**	-.038	.228***
Self-isolation	-.233***	.324***	.215***	-.190***	.340***
Emotional-expression	-.254***	.241***	.162***	-.126**	.161***
Self-blame	-.327***	.237***	.209***	.181***	.333***
Problem-focused coping	.125**	-.128***	-.145***	.308***	-.029
Help-seeking	.012	-.097*	-.070	.149***	.005
Problem-solving	.104*	.046	-.084	.233***	.071
Positive-thinking	.263***	-.230***	.215***	.400***	-.169***
Age	.016	.016	-.039	.028	-.112*
Years' experience	.001	.027	-.048	.018	-.081
Night shifts p. week	-.030	.066	.031	.082	.020
Days worked p. week	.058	.177**	-.006	.007	.068
Days since free day	.006	.038	.054	-.033	.009

EE = emotional exhaustion; DP = depersonalisation; PA = personal accomplishment; PTSD = posttraumatic stress disorder.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

#### 4.5. Predictive model from resilience and coping

The sample was randomly divided into two groups, one for testing the model and the other for cross-validation. A PALV was conducted using the first subsample (N = 244) to explore the relationship between resilience, coping styles, burnout, and PTSD. Fig. 1 shows the result of this PALV. The model predicted between 20% and 37% of the variance in burnout dimensions and PTSD scores. Coping strategies were the most important predictors. The problem-focused coping style was related to better outcomes (lower BOS and PTSD scores), and the emotion-focused coping style was related to worse outcomes (higher BOS and PTSD scores). Contradicting our expectations, the relationship between resilience with burnout dimensions and PTSD were not significant. The ratio  $\chi^2/df$  and the SRMR were inside the limits of acceptance. The

remaining indexes fell short of the standard limits of acceptance, as Table 5 shows. So, to test the validity of the model, a cross-validation analysis with the two randomised subsamples was carried out, which showed that fit was not significantly reduced when restrictions were imposed for measurement weights ( $\Delta\chi^2 = 20.43$ ,  $p = .616$ ), structural weights ( $\Delta\chi^2 = 21.72$ ,  $p = .652$ ), structural covariances ( $\Delta\chi^2 = 21.96$ ,  $p = .783$ ), structural residuals ( $\Delta\chi^2 = 22.64$ ,  $p = .793$ ), and measurement residuals ( $\Delta\chi^2 = 45.79$ ,  $p = .523$ ). Therefore, it may be concluded that the model is well-estimated and that it should not be rejected.

#### 4.6. Comparison of the model between PICU and non-PICU staff members

To explore whether the relations in the model tested differed between these two groups, we conducted an MGA, with samples of PICU and non-PICU staff. The results of the MGA showed that the fit index significantly decreased when restrictions were imposed for measurement weights ( $\Delta\chi^2 = 39.66$ ,  $p = .017$ ), structural weights ( $\Delta\chi^2 = 42.89$ ,  $p = .014$ ), structural covariances ( $\Delta\chi^2 = 49.91$ ,  $p = .007$ ), structural residuals ( $\Delta\chi^2 = 52.67$ ,  $p = .005$ ), and measurement residuals ( $\Delta\chi^2 = 96.13$ ,  $p = .000$ ) which indicates differences between samples. To explore which variables were different, we compared regression weights using the Z-Clogg, Petkova and Haritou test.<sup>40</sup> This test showed that the only difference in the model between PICU and non-PICU staff was that resilience was directly related to DP only for PICU staff, while not related for non-PICU staff (mean PICU subsample = 1.49, standard deviation = .52; mean non-PICU subsample = -.46; standard deviation = .68; Z-Clogg = 1.98, >1.96).

## 5. Discussion

This study confirms that staff members working in intensive care show moderate rates of psychological impairment, with 56% of PICU workers showing burnout in at least one of its dimensions, and 20.1% reporting PTSD. These rates were very similar to those

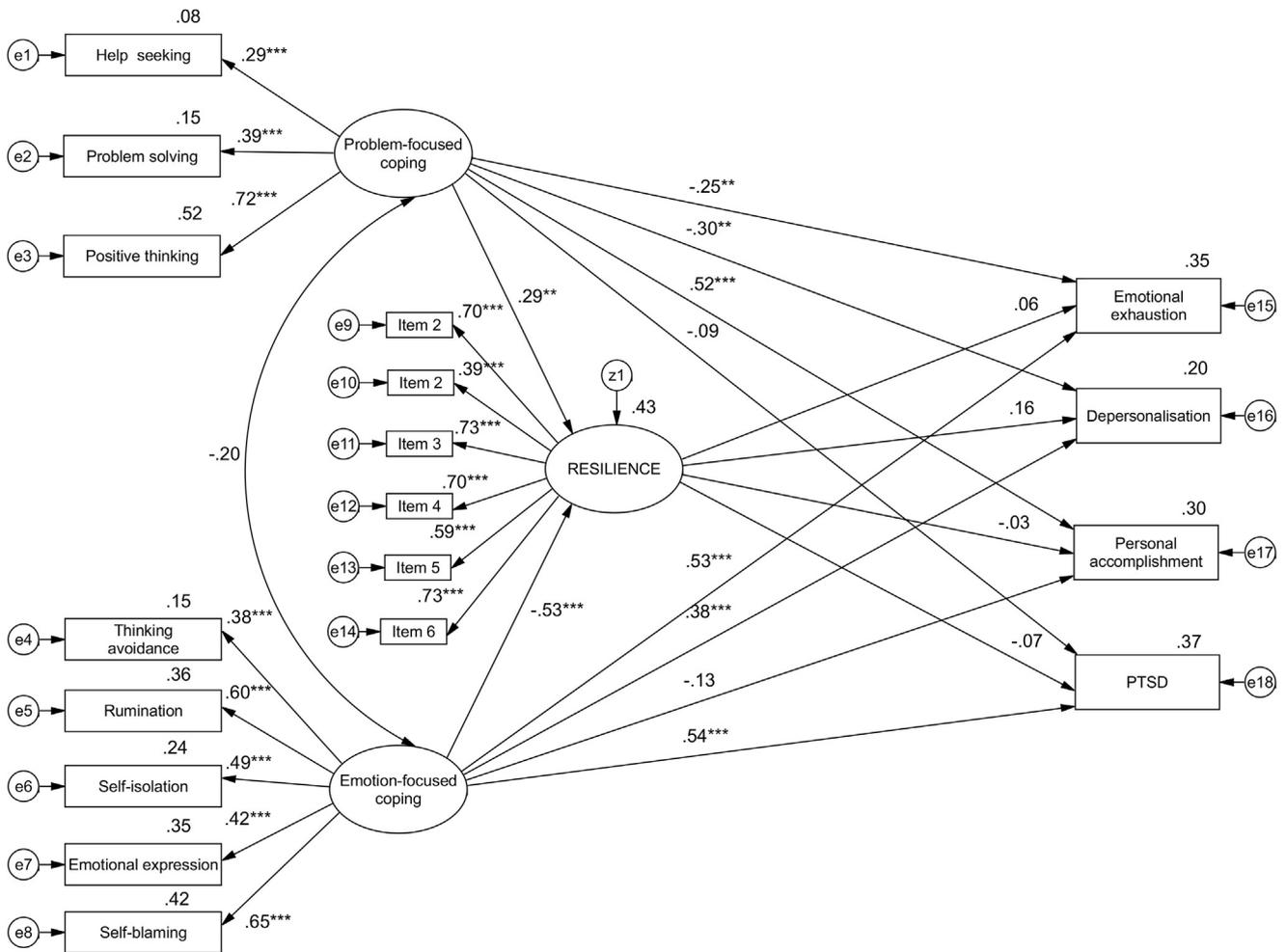


Fig. 1. Standardised estimates and squared multiple correlations for the path analysis with latent variables. \* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* =  $p < .001$ .

**Table 5**  
Goodness of fit for the path analysis with latent variables (PALV), the cross-validation analysis (CVA) and the multiple group analysis (MGA).

	$\chi^2/df$	GFI	IFI	CFI	RMSEA	SRMR
PALV	2.60	.875	.816	.811	.081	.077
CVA	2.57	.854	.789	.788	.057	.081
MGA	2.80	.868	.797	.802	.061	.072

GFI = goodness of fit index; IFI = incremental fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual.

found in previous studies.<sup>13–16</sup> However, contrary to data from a study conducted in an adult ICU,<sup>20</sup> PTSD and burnout were not lower for staff working in non-critical units, showing that the tendency of having mental health issues is not exclusive for staff members working in an ICU setting. Additionally, burnout and PTSD scores were irrespective of discipline, contrary to a study which found the highest burnout in nurses.<sup>12</sup> Thus, all working staff in paediatrics are equally vulnerable to the development of burnout and PTSD.

Our study has shown that 20%–37% of the variance in burnout dimensions and PTSD can be predicted predominantly from whichever coping strategies are used. As expected, individuals who used less the problem-focused coping style—and mainly positive thinking—and more the emotion-focused coping style show higher burnout and PTSD. Thus, active coping strategies to solve

difficulties at work and learning from such experiences lead to better outcomes than strategies such as rumination and thinking avoidance, which is coherent with previous research and has clear implications for practice.<sup>13,14</sup> This data may be explained by the fact that strategies under the problem-focused coping style are likely to lead the professional to the best possible solution, causing a significant change in the situation, while ineffective strategies under the emotion-focused coping style do not contribute to problem solving and may lead to the chronicity of the problem and to feelings of uncontrollability about the environment.<sup>33</sup> However, contrary to our expectations, resilience does not mediate the relation between coping and distress. As correlation analyses have shown, resilience is inversely related to burnout and PTSD; however, when introduced into the model, its relation with these variables is not significant because coping styles are much stronger predictors of burnout and PTSD than resilience.

Among differences in the model between PICU and non-PICU staff, interestingly resilience is directly related to DP only in PICU staff. These data suggest that for individuals who are repeatedly exposed to traumatic events, such as PICU staff, avoiding excessive detachment may be one way of protecting oneself from intense emotional arousal that could interfere with functioning effectively on the job.<sup>4</sup> Thus, in line with some previous studies, developing a sense of “detached concern”<sup>37</sup> can be a healthy strategy for PICU staff. However, this applies only to a certain extent and excessive detachment combined with little concern becomes pathological DP.

Thus, staff members should be concerned about the welfare of the patient but avoid crossing the thin line between involvement and overinvolvement,<sup>4,41,42</sup> which is often a complex process.<sup>42</sup> In any case, it is necessary to conduct more research exploring the association between detached concern and professional's resilience and well-being.

With regards to the association between demographic variables and distress, our results have shown that gender, age, and having children or not did not influence burnout and PTSD levels, coherent with the study of Colville et al.<sup>6</sup> With regards to work-related variables, only the occurrence of the death of a patient and having had conflicts with work colleagues or patients/families the week before were associated with higher burnout and PTSD. Thus, when working staff are struggling with immediate additional difficulties, they tend to be more distressed, as some previous studies have suggested.<sup>8,10</sup> It could be also that cumulative stress leads to a reduction in their perceived capacity of resources, which influences the way they report on themselves. Other variables, such as number of night shifts the week before or years of experience did not influence clinicians' mental health in our study group, contrary to data emerging from other research.<sup>10,21,22</sup>

Literature has pointed out that the lack of clinicians who wish to work in intensive care is a significant problem.<sup>15,23</sup> This is confirmed by our results, as the percentage of staff members who would like to be transferred to a different unit is higher for PICU (26.1%) than for non-PICU staff (17.7%). Consistent with previous studies,<sup>15</sup> our research demonstrated that an increased wish to be transferred is associated with higher burnout and PTSD. Taking care of clinicians' mental health, by developing programs and policies that provide support to them would likely contribute to reducing the problem of a shortage of critical care personnel. Programs based on mindfulness training<sup>43</sup> or teaching stress management<sup>44</sup> skills have proved to be useful in reducing the stress associated with working in intensive care and increasing clinicians' quality of life.<sup>43</sup> However, the effect of such intervention over withdrawal from intensive care should be investigated. This is a multifactorial phenomenon<sup>15</sup> as many other aspects (e.g., long working hours, night shifts<sup>15</sup>) can affect their wish to be transferred to another unit.

The present study has several strengths. Being multicentre, it permitted the inclusion of a representative sample from the Spanish PICU staff population. Additionally, physicians, nurses, and nursing assistants have been included. The inclusion of a subsample of paediatric non-critical staff has allowed us to make comparisons. Furthermore, the study has pointed out that coping strategies are relevant variables in the prediction of psychological impairment, which suggest several implications for intervention which will be described later. However, the study has limitations too. First, participation was voluntary, so there is potential for bias; maybe more distressed clinicians are more motivated to participate to express their dissatisfaction or maybe more distressed individuals may be less likely to participate due to avoidance.<sup>1</sup> Second, even though the data collected were anonymous, there could be a social desirability bias. Third, some of the factors identified in previous studies which could predispose individuals to burnout (e.g. low work recognition,<sup>12</sup> perceived burnout complaints among colleagues,<sup>9</sup> the use of certain specific coping strategies such as regular exercise,<sup>16</sup> talking to seniors and having hobbies<sup>14</sup>) were not included in this study. Fourth, because burnout development is a chronic process, it would have been relevant to include longer term professional data such as number of night shifts the previous year, instead of number of night shifts the week before. Finally, this study is cross-sectional, and therefore it is not possible to assign causality to the associations identified. Future research should confirm these results through longitudinal studies, including the use of more specific coping strategies (e.g. exercise) and including other

relevant variables in the model, such as work recognition and perceived burnout complaints among colleagues.

Overall, the results of this study suggest some implications for practice. First of all, the study indicates that interventions to prevent burnout and PTSD in paediatric clinicians are needed, as well as treatment interventions for workers who are already experiencing distress. Intervention to improve professional's mental health should focus on exercising strategies which involve active emotional processing of traumatic experiences at work, avoiding the use of emotion-focused coping styles, and promoting a problem-focused coping style. Additionally, for PICU staff, it seems important to provide training in self-regulating relationships with patients to help to find a balance between necessary detachment and concern.<sup>40,45</sup> As conflicts with colleagues are related to higher burnout and PTSD, it seems advisable to also supply training to develop the capacity to solve interpersonal conflicts, as being able to manage them better could reduce their negative impact over their mental health. Finally, considering that working staff are especially vulnerable to burnout and PTSD after the death of a child, it seems beneficial to provide them with adequate end-of-life care training. Previous studies suggest that end-of-life discussions may help clinicians to address their burnout and PTSD symptoms.<sup>46</sup> We consider that to implement these interventions, it would first be necessary to establish a trauma informed care culture, in which awareness of the importance of taking care of staff members' mental health exists among both staff and hospital administrators. Only in such a scenario would preventative interventions not be isolated actions but part of a culture which cares about personnel well-being.

In conclusion, we found burnout and PTSD to be frequent among paediatric personnel in Spain. Better mental health status was associated with higher utilisation of the problem-focused coping style and a lower utilisation of the emotion-focused coping style. Higher distress rates emerged with the death of a child or when interpersonal conflicts had recently occurred in the unit. Based on these findings, intervention aimed at encouraging adaptive coping styles, improving the ability to solve interpersonal conflicts and providing the skills necessary to face end-of-life situations, are likely improve the well-being of staff working in PICU.

## Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.aucc.2018.02.003>.

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