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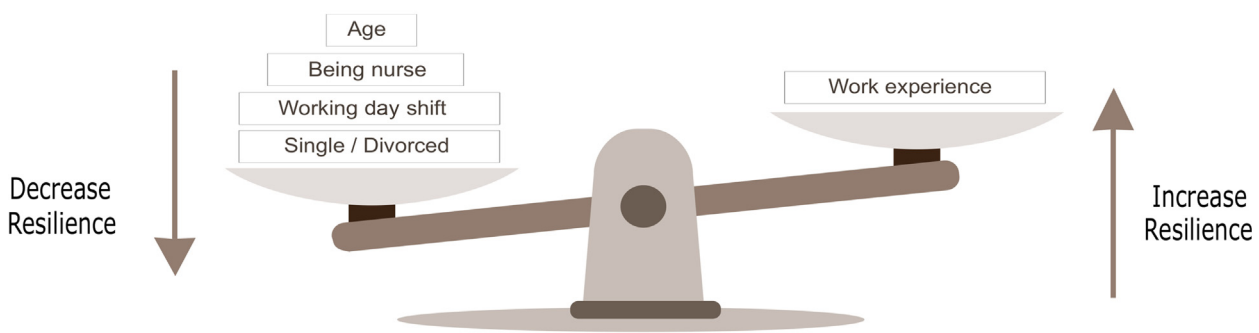
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RESILIENCE AMONG PROFESSIONAL HEALTH WORKERS IN EMERGENCY SERVICES

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Graphical abstract

RESILIENCE IN HEALTH CARE WORKERS EMERGENCY DEPARTMENT



Contribution to Emergency Nursing Practice

- The current literature on resilience indicates that several variables affect the development of nursing and health care workers' resilience.
- This article contributes the findings that resilience in nurses is low and is influenced by work-related and personal variables such as shift work, age, and marital status.
- Key implications for emergency nursing practice found in this article are that resilience needs to be strengthened and that organizations should actively participate in implementing strategies to improve working conditions and personal resources.

Abstract

Introduction: Although it seems logical to assume that working in an emergency service implies having a great capacity to face extreme situations, resilience in health care workers has been shown to be related not only to individual personality characteristics but also with external factors. The objective of this study was to determine the resilience of professional health workers in emergency services and its relationships with socio-demographic and working conditions.

Methods: This cross-sectional study included emergency physicians, nurses, and nursing assistants. Sociodemographic variables and the Resilience Scale-25 were analyzed.

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Results: A total of 320 professionals participated. Their mean age was 43.5 years (SD 8.9), and 81.87% were women. The mean resilience score was 133.52 (SD 7.22), which corresponds to moderately low to moderate levels. An association was found between the highest resilience scores and being a physician (χ^2 8.84; $P=0.01$) and a higher capacity if working in emergency mobile units (χ^2 6.29; $P=0.04$). Working the day shift and being a nurse (beta = -5.71 ; $P=0.02$) were associated with lower resilience scores. Age (odds ratio 1.095; $P=0.02$; 95% confidence interval 1.015, 1.184), and not having a partner decreased resilience (being divorced odds ratio 5.17; $P=0.01$; 95% confidence interval 1.503, 18.235 and being single odds ratio 3.371; $P=0.01$; 95% confidence interval 1.259, 9.257). However, more work experience increased the resilience levels (odds ratio 0.906; $P=0.02$; 95% confidence interval 0.833, 0.983).

Discussion: Resilience in professional health workers was related to personal and working conditions. The scores of emergency staff were low and should be improved with specific strategies.

Key words: Psychological resilience; Emergencies; Medical staff; Nursing staff

Introduction

Resilience is defined in general terms as the ability to adapt to change.¹ Some researchers have applied the concept to health care professionals, stating that resilience is the ability to maintain personal and professional well-being to cope with stress and adversity at work.² It therefore seems logical to assume that working in an emergency service implies having a great capacity to face extreme situations. However, resilience has been shown to be related not only to individual personality characteristics (personal satisfaction, perseverance, self-control, self-confidence, and commitment),^{3,4} but also to external factors (working conditions, relationship status, and physical and mental health).^{5,6}

In health workers, resilience has been found to be a protective factor against mental health problems,⁷ and has been shown to play a beneficial role in reducing burnout and the perceived workload in emergency professionals.⁸ In addition, it has been shown that individuals with low resilience are more anxious when faced with adversity, and they experience marked distress by trying to resolve adverse situations before they happen.⁹

Certain sociodemographic and work-related characteristics are also associated with the ability to cope with

changes. For example, previous studies show a correlation between having a partner¹⁰ and children¹¹ and better levels of resilience in nursing professionals, and indicate that age, colleagues' support, and work autonomy increase resilience in doctors.^{9,12} However, the working conditions of nurses are also determinants of the development of resilience, which has been shown to be decreased when nurses suffer stress and workplace bullying.^{13,14}

Despite the numerous studies on resilience in health professionals^{6,10} and the need to implement strategies to improve the situation of emergency workers,^{15,16} institutions still do not take active measures to strengthen resilience. Therefore, given the international health emergency caused by coronavirus disease (COVID-19), in which it is believed that 90,000 health professionals have been affected by the disease, and 260 nurses have died,¹⁷ it seems pertinent to continue investigating resilience in health care workers, specifically those who work in emergency departments and who may be subjected to high-stress situations.

PURPOSE

The objective of this study was to understand the resilience of health professionals working in hospital and extrahospital emergency services and to determine the relationships of resilience with sociodemographic and work-related characteristics.

Methods

STUDY DESIGN, SETTING, AND PARTICIPANTS

A cross-sectional descriptive study was conducted between May 2016 and September 2016. The inclusion criteria were as follows: health care personnel working as physicians, nurses, or nursing assistants who performed care functions in hospital and extrahospital emergency services (emergency mobile units [EMUs]) belonging to the health service of the principality of Asturias, Spain, and who agreed to voluntarily participate and complete the data collection form in its entirety. According to the data provided by the management of the centers, 628 people from the chosen professional categories worked in emergency departments. To calculate the sample size, we considered a power of 80%, a confidence level (CI) of 95%, and a medium effect size for a general linear model with 13 predictor variables, which yielded a minimum sample size of 131 (WebPower library in R [The R Foundation for Statistical Computing] was used).

VARIABLES AND INSTRUMENT

Using an anonymous and self-administered questionnaire, sociodemographic variables (age, sex, and marital status) and work-related variables (professional category, type of employment contract, length of professional experience, length of service [seniority], and work shift) were collected. To study resilience, we used the Resilience Scale–25 (RS-25),¹⁸ developed by Wagnild and Young,³ to identify the degree of personal resilience, which is considered a positive personality characteristic that improves adaptation. The scale consists of 25 items that participants indicate their degree of agreement with on a Likert scale ranging from 1 to 7, in which the lowest number corresponds to “disagree” and the highest number corresponds to “agree.” The total score varies from 25 to 175, with higher scores indicating greater resilience. The scale also establishes different levels of resilience as a function of the total score: 115 points or less indicates very low resilience; 116 points to 144 points indicates moderate resilience to moderately low resilience; and 145 points or more indicates moderately high resilience to high resilience. The RS-25 has been validated at the international level and has adequate psychometric properties in the Spanish population (Cronbach alpha for the total scale = .93),¹⁸ and it is protected under license.

PROCEDURE

The supervisors of each unit were informed about the main characteristics of the study and the dates when data collection would begin. Each unit was visited during different work shifts to deliver the questionnaires to reach the entire accessible population. Once consent was obtained, the questionnaire was given to the participant along with an explanation of how to correctly fill it out and the instruction to return it personally to the researcher at some point during the work shift or leave it at the unit in a specially designated container. A license to use the scale was obtained from the original author.

ETHICAL STATEMENT

This study was granted ethical approval by the regional clinical research ethics committee of the principality of Asturias (code 83/15). It conformed to the principles embodied in the Declaration of Helsinki. In addition to the authorization obtained from the research ethics committee of the principality of Asturias, approval was

also obtained from the management of the health care areas and the coordinator of the EMUs.

DATA ANALYSIS

The statistical package SPSS version 21.0 (IBM Corp) and the software R version 3.3.1 were used for data analysis. Once the database with the study variables was constructed, a descriptive analysis was performed using absolute frequency for the qualitative variables and mean, SD, percentage, and range for the quantitative variables. A bivariate analysis was subsequently performed; for the comparison of qualitative variables, the chi-square test was used. The relationship between a quantitative variable and a dichotomous qualitative variable was tested using the *t* test when the distribution was normal, and the Mann-Whitney U test otherwise, to determine whether there were significant differences between the means of the 2 groups. For qualitative variables with more than 2 categories, analysis of variance was used for normal distribution, and the Kruskal-Wallis test was used when the distribution did not meet the normality criterion. A CI of 95% ($P \leq 0.05$) was established for all cases. Finally, we conducted a multivariate analysis using ordinal logistic regression and a linear model to study the relationship between the scale scores and the ordinal regression for resilience capacity.

Results

PARTICIPANTS

A total of 320 professionals participated, with a greater representation of women ($n = 262$, 81.87%) than men ($n = 58$, 18.13%), and a mean age of 43.5 years (SD 8.9). The global response rate was 51.11%, and the response rate of the nurses (60.47%) and nursing assistants (51.28%) was higher than that of the physicians (40.18%).

DESCRIPTIVE DATA

Of the participants, 65.63% ($n = 210$) reported having a partner, 25% ($n = 80$) were single, 8.12% ($n = 26$) were divorced, and 1.25% ($n = 4$) were widowers. Regarding the work-related variables, the mean length of professional experience (total time working in a professional category) was 16.8 years (SD 8.4), the mean length of service in the emergency department was 9.1 years (SD 6.9), 15.31% ($n = 49$) did not work night shifts, and 54.37% ($n = 174$) were casual workers.

TABLE 1
Relationship between Resilience Scale–25 total score and working and sociodemographic variables

Variable	Mean	SD	Median	95% CI	Point estimates	P value
Professional category					χ^2 8.84	0.01*
Physicians	134.72	18.26	137.40	128.54, 140.90		
Nurses	128.74	15.76	130	125.19, 132.30		
Nursing assistants	130.60	21.11	136	124.78, 136.42		
Marital status					<i>F</i> 3.69	0.01 [†]
Single	124.38	21.20	127	117.31, 131.45		
Married/in a partnership	133.40	16.27	15	130.33, 136.46		
Divorced	125.89	19.92	129	115.98, 135.80		
Work shift					<i>Z</i> –2.10	0.03 [‡]
Not night shift	126.36	21.58	133	117.99, 134.73		
Including night shift	131.48	17.37	135	128.57, 134.40		
Nurses						
Hospital emergency service	128.06	15.62	130	124.31, 131.81	<i>Z</i> –2.41	0.01 [‡]
Emergency mobile units	134	16.77	138	121.11, 146.89		
Nursing assistants						
Work shift						0.00 [§]
Not night shifts	118.20	24.94	114	104.39, 132.01	<i>t</i> –3.08	
Including night shifts	135.5	17.43	138	129.77, 141.23		
Physicians						
Marital status					<i>F</i> 7.16	0.00 [†]
Single	119	33.43	129	88.08, 149.92		
Married/in a partnership	139.46	9.82	139	135.31, 143.61		
Divorced	134	10.93	138	120.43, 147.57		

CI, confidence interval.

* Kruskal-Wallis test

[†] Analysis of variance

[‡] Mann-Whitney U test

[§] *t* test

MAIN RESULTS

The mean RS-25 score was 133.52 (SD 7.22), and the most prevalent resilience level was moderately low to moderate ($n = 220$; 62.5%), followed by moderately high to high ($n = 75$; 23.4%) and very low ($n = 45$; 14.1%).

We found a significant association between the highest scores on the RS-25 and the professional category of physician ($\chi^2=8.84$; $P = 0.012$), the marital status of married/in a partnership ($F=3.69$; $P = 0.01$), and working night shifts ($Z=-2.10$; $P = 0.035$) (Table 1). Bonferroni post hoc analyses confirmed the differences between the groups, and the average resilience in the single group was lower than that in the married/in a partnership group ($F=-6.574$; $P = 0.02$). When the different professional groups were compared, a relationship was found between the RS-25 score and

nursing professionals working in EMUs ($Z=-2.41$; $P = 0.01$), nursing assistants who worked night shifts ($t-3.08$; $P = 0.00$), and physicians who were married or in a partnership ($F=7.16$; $P = 0.00$) (Table 1). Similar to the entire sample, Bonferroni post hoc analyses confirmed the differences between the groups, and the average number of physicians belonging to the single group was lower than those belonging to the married/in a partnership group ($F=-16.442$; $P = 0.001$).

Resilience capacity was shown to be associated with profession, with moderately low to moderate capacities being more frequent among physicians ($\chi^2=18.27$; $P = 0.001$), males ($\chi^2 8.60$; $P = 0.01$), and those who worked in EMUs ($\chi^2=6.29$; $P = 0.04$) (Table 2). When the different levels of resilience were analyzed as a function of professional category, a significant association was found

TABLE 2
Relationship between resilience capacity and working and sociodemographic variables

Variable	Resilience capacity			Point estimates	P value
	Very low n (%)	Moderate to moderately low n (%)	Moderately high to high n (%)		
Professional category				χ^2 18.27	0.00 [‡]
Physicians	6 (6.98)	60 (69.76)	20 (23.26)		
Nurses	24 (15.58)	104 (67.54)	26 (16.88)		
Nursing assistants	15 (18.75)	36 (45)	29 (36.25)		
Sex				χ^2 8.60	0.01 [‡]
Female	41 (15.65)	154 (58.78)	67 (25.77)		
Male	4 (6.9)	46 (79.31)	8 (13.79)		
Performance area				χ^2 6.29	0.04 [‡]
Hospital emergency service	44 (46.06)	167 (60.94)	63 (23)		
Emergency mobile units	1 (2.17)	33 (71.74)	12 (26.09)		
Nurses				χ^2 7.49	0.02 [‡]
Hospital emergency service	23 (17.56)	90 (68.7)	18 (13.74)		
Emergency mobile units	1 (4.35)	14 (60.87)	8 (34.78)		
Nursing assistants				χ^2 16.63	<0.001 [‡]
Not night shifts	9 (50)	6 (33.33)	3 (16.66)		
Including night shifts	5 (8.33)	30 (50)	25 (41.66)		
Physicians				F 3.59	0.03 [§]
Age	35.5 [*] ; SD 8.68 95% CI 26.38, 44.62	44.54 [*] ; SD 7.25 95% CI 42.62, 46.47	42.16 [*] ; SD 9.65 95% CI 37.50, 46.81		
Length of service	2.25 [†] ; SD 6.23 95% CI -1.64, 11.44	9.25 [†] ; SD 6.61 95% CI 8.96, 12.47	5.58 [†] ; SD 8.44 95% CI 3.37, 11.51	χ^2 8.74	0.01 [¶]

CI, confidence interval.

* Mean

† Median

‡ Chi-square test

§ Analysis of variance

¶ Kruskal-Wallis test

between nursing professionals working in hospital emergency units ($\chi^2=7.49$; $P = 0.02$), nursing assistants who worked night shifts ($\chi^2=16.63$; $P < 0.001$), and physicians with an older age and longer length of service (seniority), who demonstrated intermediate resilience capacity ($F=3.59$; $P = 0.03$ and $\chi^2=8.74$; $P = 0.01$, respectively) (Table 2). Bonferroni post hoc analyses confirmed the differences between the groups, and the mean age of the group of physicians with moderate resilience to moderately low resilience was higher than that of the physicians with very low resilience ($F=9.07$; $P = 0.03$).

The multivariate model in which the dependent variable was the RS-25 total score was significant: the professional category “nurse” versus “nursing assistant” (beta = -5.71;

$P = 0.02$) and not working night shifts were shown to decrease the total scale score (R^2 0.076; $P < 0.001$).

Last, the multivariate model in which the dependent variable was resilience capacity indicated that a longer duration of professional experience increased the probability of having high levels of resilience (odds ratio [OR] = 0.906; $P = 0.02$; 95% CI 0.833, 0.983). In contrast, the probability of having low and intermediate levels of resilience increased with age (OR = 1.095; $P = 0.02$; 95% CI 1.015, 1.184), that is, the level of resilience decreased with age. Regarding marital status, being divorced and single increased the probability of having low levels of resilience (OR = 5.17; $P = 0.01$; 95% CI 1.503, 18.235 and OR 3.371; $P = 0.01$; 95% CI 1.259, 9.257, respectively) (Table 3).

TABLE 3
Ordinal logistic regression model for resilience capacity

Variable	Coefficient	P value	OR	95% CI EXP(B)	
				Lower bound	Upper bound
Professional experience	-0.098	0.02	0.906	0.833	0.983
Age	0.091	0.02	1.095	1.015	1.184
Marital status: divorced	1.642	0.01	5.17	1.503	18.235
Marital status: single	1.215	0.01	3.371	1.259	9.257

Nagelkerke R^2 0.1951; parallel-lines assumption verified ($P = 0.69$).
OR, odds ratio; CI, confidence interval; EXP(B), exponentiation of the B coefficient.

Discussion

Our study found an intermediate resilience score that corresponded to moderate to moderately low capacity for resilience, a higher degree of resilience than that reported in other publications.^{19,20} Few publications have previously analyzed this characteristic of emergency health professionals, which has emerged as even more relevant since the emergence of the COVID-19 pandemic.²¹ Therefore, our research is an interesting starting point for evaluating the evolution of health workers who were on the front lines during the crisis.

The Connor-Davidson Resilience Scale establishes a total scoring system similar to that of the RS-25; these 2 scales are among the most widely used tools focusing on assessing resilience, although this response was not categorized in the original version.²² This scale has also been shown to have adequate psychometric properties; thus, its use can be considered appropriate in future research.

Both work and personal factors were shown to influence the resilience of our sample. Regarding the work-related variables, the work shift was found to be a predictive factor for the development of resilience, with greater resilience observed in professionals who worked night shifts. Possible explanations for this finding include better adaptation among individuals who are accustomed to constantly changing their life rhythms for work reasons or the existence of confounding variables that were not considered, such as worker age, with the general belief that professionals who work night shifts are younger. This factor might explain another of our findings, which related older age with decreased resilience, as opposed to other studies that reported the inverse relationship.^{10,12} In addition, recent research suggests that professionals working on the front lines during the COVID-19 pandemic experienced a lower prevalence of burnout than their colleagues,²³ suggesting an interesting line of future research. Nonetheless, work shift and its relationship with resilience have rarely been reviewed in the liter-

ature, and no relationship has been established⁶; given the demonstrated role of work shift as a predictor of resilience, this relationship should be analyzed in future studies.

It is striking that unlike age, the duration of professional experience is positively related to resilience. It seems necessary to analyze why 2 variables that seem directly proportional (given that older age suggests longer professional experience) yielded opposite results. A possible explanation is provided by another variable collected in our study, the duration of service (seniority), which is not necessarily correlated with the worker's total duration of professional experience. This discordance makes it pertinent to continue investigating both variables in future studies and to verify whether they may be related to other psychosocial risks associated with health professionals, such as stress or burnout, or if they are isolated but determinant factors in the development of resilience.^{14,24,25} In addition, job satisfaction could explain the age discordance with the resilience of health care workers, because severe work-private life conflicts, work-life balance incompatibility, and fewer opportunities for development for nurses have demonstrated a negative association with job satisfaction in older nurses.^{26,27}

The existence of a better capacity for adaptation and coping with adversity in medical professionals was investigated in previous studies that confirmed that work commitment, autonomy, and independence at work were related to resilience.^{5,28} This supports the results of the present study, in which physicians had higher scores, and being in the nursing profession was a risk factor that decreased resilience. We currently do not have an explanation for why the nurses in our sample presented the lowest levels of resilience, and this finding has not been reported in previous studies. For this reason, analyses of the situations of different professional groups in future studies are necessary to inform measures to improve the adaptation of nurses.

Emergency professionals can conduct their work in hospital or extrahospital settings. Our finding that EMU workers demonstrated significantly higher resilience scores

than hospital professionals has not been previously reported in other studies and is worth considering in future research. Perhaps the type of care provided, which occurs far from the health center and often in extreme and adverse environments, increases the ability of professionals to adapt, which is reflected in their resilience scores.

From a social standpoint, there are theories about the role of the family and the partner as cumulative protective factors that lead to resilience.^{10,29} These concepts were corroborated by our results, which affirm a greater ability to overcome adversity among individuals who have a partner.

Limitations

Some limitations in this study should be considered. First, the design does not allow us to determine cause and effect but only to describe the associations. Second, because the participants worked in emergency services, the results may not be generalizable to other settings; therefore, an extensive analysis in other departments is considered determinant. Third, there may be some confounding variables that we have not studied that could influence resilience, such as salary, commitment to the company, job satisfaction, or how valued a particular health care provider feels in their institution. In addition, participation in the study was voluntary; therefore, selection bias is possible. Finally, the RS-25 has adequate psychometric properties and has been widely used in previous studies in different contexts; however, the fact that it is copyrighted and payment is necessary for its use may be a reason for its lack of use in previous studies of health professionals.

Implications for Emergency Nurses

Improving resilience in emergency nurses is necessary for multiple reasons. First, it is necessary to strengthen the resilience of nursing students and current workers to encourage both the recruitment of new nurses and their retention in emergency services.¹⁵ In turn, the positive influence of nurse resilience in terms of work performance, job satisfaction, and commitment to the organization^{5,30,31} makes it logical that institutions will benefit if they invest in measures that increase resilience in workers. In fact, the effectiveness of different strategies for improving resilience in nursing personnel, such as formal and informal support from the institution and training in specific skills or mindfulness, has been demonstrated.^{14,32,33}

A recent project led by the American Nurses Association, the Emergency Nurses Association, the American

Association of Critical-Care Nurses, and the American Psychiatric Nurses Association stands out; this project was designed by and for nurses to help nurses cope with stress arising from the COVID-19 outbreak. This project involves virtual platforms to allow professionals to share thoughts, experiences, and doubts; apps focusing on physical and mental well-being through meditation, breathing exercises, and lifestyle tracking; and support by a team of professionals virtually available 24 hours, 7 days per week.³⁴ It seems appropriate that these types of support interventions persist over time and are not only specific strategies for extreme cases. International campaigns to increase awareness of the importance of nurses in society and health are essential; however, such campaigns are insufficient if measures to evaluate and control institutional policies regarding health workers are not taken into consideration.

Conclusions

Resilience in emergency professionals is influenced by socio-demographic and work-related factors. The levels of resilience among emergency professionals seem to be insufficient, and adequate strategies are needed to increase the adaptive capacity and health of these workers.

Author Disclosures

Conflicts of interest: none to report.

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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