



Research Article

Critical care nurses' intention to leave and related factors: Survey results from 5 European countries

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ABSTRACT

Objectives: To determine the nursing intention to leave in critical care units and explore related factors along with work environment and sociodemographic variables.

Design and setting: Quantitative cross-sectional study in five European countries (Spain, Poland, Croatia, Cyprus and Romania) through a self-administered survey in 2021.

Methods: The "AACN Critical elements of a healthy work environment scale. National Survey of Critical-Care Nurse Work Environments" by the American Association of Critical Care Nurses was distributed to all nurses working in intensive care units through a convenience sampling method. The questionnaire included questions about healthy work environment, burnout, violence, intention to leave and sociodemographics.

Results: 1033 responses were analysed. Participants from each country varied between 75 and 275 nurses. Mean age was 37.3 years old (SD 9.9) with a mean nursing experience in critical care of 10.8 (9.2) years. Despite 83.1 % of the nurses were satisfied with their current job, 22.8 % planned to leave their position. Intention to leave was independently associated with the country, gender, age, satisfaction with current job and frequency of moral distress ($p < 0.05$) along with several work-related variables, such as lower perception of a healthy work environment. Among the reasons to reconsider leaving the job, the most rated were higher salary and benefits (87.2 %), better staffing (85.3 %) and meaningful recognition (82 %). Conversely, the most relevant reasons that kept nurses working in their organisation, were salary and benefits and the people they work with.

Conclusion: Almost one out of three critical care nurses are considering leaving their job. Many aspects of the work environment that influence the intention to leave are modifiable.

Abbreviations: AACN, American Association of Critical Care Nurses; HWE, healthy work environment; HWEAT, Healthy work environment assessment tool; ICU, intensive care unit.

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Implications for clinical practice: Managers need to prioritise the retention of registered nurses, not only recruiting new personnel. Many aspects of the working environment need to be addressed in order to retain critical care nurses.

Introduction

The nursing shortage has been a long-standing issue. However, it has become a priority for international authorities, especially following the COVID-19 pandemic [1–3]. It is not solely the shortage of nurses, but also the fact that nurses are leaving their positions or even the profession altogether [4,5]. Recent studies demonstrate that 12–64 % of nurses are considering leaving their jobs [6–9], and approximately 10–24 % are contemplating exiting the profession [8,10]. This crisis requires not only increasing the nursing workforce but also retaining nurses in their positions and, more importantly, within the profession [4,11]. A recent report from the World Health Organisation pointed out this situation across Europe and made a call to the need for urgent policy actions [11].

Nursing turnover is a complex issue requiring diverse investigations and interventions [4,5,7,12]. Particularly, intensive care units (ICUs) face a critical situation due to the specialized training required to ensure high-quality and safe patient care [13]. Fernández-Castillo et al., [14] evidenced that quality training, mentorship programs, emotional support and professional recognition are key components in attracting ICU nurses' talent.

It is also important to consider that we are experiencing a generational change, which is currently having significant implications for the management of healthcare professionals [15,16]. There is already evidence that newly graduated nurses exit the profession more frequently and earlier. Two systematic reviews have shown that between 18–57 % choose to leave the nursing profession after two or three years of registration [17,18]. Personal values are changing, prioritizing work-life balance, personal recognition, feeling valued by the organization, job satisfaction and work environment compared to previous generations [18,19].

In this context, work environment refers to organizational characteristics present in the workplace that affect the workforce's quality of life and the quality of care delivered to patients [20]. In 2006, the American Association of Critical Care Nurses (AACN) defined the standards that needed to be met to have a healthy working environment (HWE). These were: skilled communication, true collaboration, effective decision-making, adequate staffing, meaningful recognition and authentic leadership [21]. Although these standards were developed in the United States of America, similar characteristics have been identified by the Registered Nurses' Association of Ontario in Canada [22] and in two other international studies [23,24]. HWE have demonstrated significant potential to enhance nurse retention, well-being, job satisfaction, while reducing nursing turnover and vacancy rates [8,9,11,20,25,26].

The AACN designed and validated the "AACN Critical Care Nurse Work Environment Survey" [27] to evaluate ICU work environments which includes a section with the "Critical Elements of a Healthy Work Environment" scale (HWEAT version 1) [28]. Their results shown that units adopting its standards have better nurse and patient outcomes [20,25,26]. While HWEAT has been used in the United States of America and recently validated in Canada [29] and Japan [30], in Europe, its application is limited to a study conducted by Friganovic, et al. [31] which analysed perceptions of abuse and HWE among ICU nurses.

Based on AACN standards, a research team from five European countries, conducted a previous project to create a training intervention to promote HWE in ICUs [32]. As part of this initiative, the team investigated HWEs, their relationship with nurses' intention to leave, the key factors that encourage retention and the relevance of HWE through an international cross-sectional study across ICUs in these five countries. Additionally, this study provides evidence on the

international applicability of the HWEAT survey in Europe, highlights the impact of HWEs in these selected European countries, and offers insights into factors influencing nurses' intention to stay in their workplace, beyond the intention to leave."

The countries included in this study are located in Southern and Eastern Europe and share similar characteristics regarding ICU nursing. In all these countries, nursing education programs at the university level are available and have access to specialization programs in ICU nursing. However, in most cases, specialized training is not a mandatory requirement for ICU employment. Moreover, nursing shortage remains a common concern across all participating countries [11].

Material and methods

Study design

A quantitative cross-sectional study was conducted through a self-administered survey distributed to ICU nurses from five European countries (Cyprus, Poland, Croatia, Romania and Spain) that had already participated in the previous project mentioned in the introduction.

Participants and data collection

Through a convenience sampling, all ICU nurses were eligible for the study. Since it was not possible to estimate the total number of ICU nurses who met the inclusion criteria, the aim was to recruit as large a sample as possible within an unknown population.

Data were collected between January 2021 and April 2022 through Qualtrics Software. The distribution of the survey was conducted mainly online but a printed version was also used by Romania. For the online distribution, investigators contacted ICU nurses via e-mail through their institutional accounts, additionally, the national critical care nurses' associations from the participating countries distributed the survey to their respective members. For the printed version, investigators themselves distributed the survey anonymously to the participating ICUs.

Instrument

Data were collected through the "American Association of Critical-Care Nurses. Critical elements of a healthy work environment scale. 2018 National Survey of Critical-Care Nurse Work Environments", which included the Healthy Work Environment Assessment Tool (HWEAT) version 1. The instrument was originally in English with a Cronbach's alpha of 0.97 [26].

After seeking permission from the AACN, the survey was translated into the languages of the different countries involved. Each country's research team conducted the translation/back-translation and a pilot-testing with 10 ICU nurses in each country to ensure the comprehension of the items. Finally, the survey underwent a reliability analysis through internal consistency for each language version. Results of Cronbach's alpha ranged from 0.858 (Polish version) to 0.948 (Romanian version) indicating a high internal consistency.

The survey is self-answered and based on the six AACN standards for establishing and maintaining HWE. The questionnaire is divided into four sections. Section A focuses on quality of care provided and awareness of the AACN standards. Section B addresses the critical elements of HWE according to the AACN through the HWEAT, which contains 16 items which are responded using a 4-point Likert scale regarding the institution and the work unit. Section C includes questions

related to appropriate staffing, moral distress, value that the organization gives to ICU nurses' health and safety, capacity of getting the work done, job satisfaction, intention to leave and factors to keep working in the current position. Section D collects demographic information. More information about the tool can be found in [Supplementary material 1](#).

Data analysis

Since it was not compulsory to complete the entire questionnaire, the response rate varied across questions. Accordingly, only participants who responded to the questions related to intention to leave and reasons to stay and at least 90 % of the questionnaire, were included in the analysis. As a result, 150 respondents were excluded, leaving a final sample of 1033 participants for the analysis. Missing values were not replaced in any case. To calculate the rating for each AACN standard (questions from section B), the mean score of all items related was used, resulting in an average score for each standard following the authors' guidelines [20].

R version 4.1.0, R Core Team (2021) and SPSS v. 26 for Windows were used for data analysis. Descriptive data were expressed as mean and standard deviation (SD) or frequencies and proportions, as appropriate. Bivariate analysis was done through Chi-squared and independent samples T-Student tests as all variables had a normal distribution and parametric tests could be used. For multiple comparisons, Bonferroni post-hoc adjustment was applied and the p-value provided corresponds to the adjusted value. A multivariate binary logistic regression analysis was conducted to evaluate the independent factors related to the intention to leave using the introduce method. Variables included in the model had a corrected p value of < 0.05 or were relevant due to the current existing evidence. Significance level was set at $p < 0.05$.

Ethics

Ethical approval was obtained from the Cyprus Bioethical Committee (CNBC 2020.01.145) which was the coordinator of the project. On the first page of the questionnaire, information of the study was provided,

and participants had to specifically give their consent to be able to access the questionnaire. Confidentiality was granted throughout the study. The questionnaire was anonymous, but in order to ensure that each participant only answered once, an alphanumeric code was created by each participant. The only person who could access the raw database and could see the anonymous codes was the statistician, who was not part of the research team. Codes were deleted for the analysis. This study is reported following the CROSS guidelines [33].

Results

Descriptive findings

In total, 1033 ICU nurses from five European countries participated, with the number of participants ranging from 75 to 275 per country. A total of 72 % ($n = 731$) were female with a mean age was 37.3 years old (SD 9.9). The majority of respondents were bedside nurses ($n = 891$; 87.7 %) with a mean of 14.1 (SD 10.1) years of nursing experience and, in particular, 10.8 (SD 9.2) years in critical care. Concerning the type of institution, more than half worked in general ICUs ($n = 646$; 64.1 %) and the majority were employed at a public hospital ($n = 784$; 86.2 %) (Table 1).

Overall, 89.8 % ($n = 928$) of the respondents were very or somewhat satisfied with being a registered nurse and 83.1 % ($n = 858$) with their current job. No significant differences in job satisfaction were found based on demographic characteristics, except for the country ($p < 0.001$), where Romania reported the highest satisfaction [90.5 % ($n = 249$)] while Poland reported the lowest [74.7 % ($n = 56$)]. However, no differences were observed with the satisfaction of being a nurse (Table 1).

Intention to leave

Of all the respondents, 21.4 % ($n = 221$) of nurses planned to leave the nursing position within the next 3 years and 11.4 % ($n = 118$) within the next 12 months, while 67.2 % ($n = 694$) had no plans to leave. A

Table 1
Demographic characteristics of the participants.

		Cyprus $n = 194$	Spain $n = 232$	Croatia $n = 257$	Poland $n = 75$	Romania $n = 275$	Total $n = 1033$
Gender [n(%)] ($n = 1019$)	Male	67 (34.7)	40 (17.3)	62 (24.5)	7 (9.3)	28 (10.5)	204 (20.0)
	Female	112 (58.0)	189 (81.8)	172 (68)	65 (86.7)	193 (72.3)	731 (71.7)
	Prefer not to answer	14 (7.3)	2 (0.9)	19 (7.5)	3 (4.0)	46 (17.2)	84 (8.2)
Age [mean(SD)] ($n = 967$)		34.9 (8.1)	38.8 (10.6)	32.9 (9.8)	42.4 (9.7)	41.1 (8.0)	37.3 (9.9)
Education [n(%)] ($n = 1003$)	Diploma	2 (1.1)	62 (26.8)	76 (30.0)	7 (9.3)	144 (56.3)	291 (29.0)
	Bachelor degree	126 (67)	39 (16.9)	139 (54.9)	12 (16)	87 (34)	403 (40.2)
	Master Degree	59 (31.4)	120 (52.0)	36 (14.2)	53 (70.6)	24 (9.4)	292 (29.1)
	Doctoral Degree	1 (0.5)	10 (4.3)	2 (0.8)	3 (4)	1 (0.4)	17 (1.7)
Years of nursing experience [mean(SD)] ($n = 999$)		11.8 (8.2)	15.8 (10.6)	11.3 (9.9)	19.9 (12.1)	15.6 (9.1)	14.1 (10.1)
Years of nursing experience in ICU [mean(SD)] ($n = 987$)		7.5 (6.9)	11.9 (9.5)	9.3 (8.9)	13.8 (11.3)	12.66 (9.1)	10.8 (9.2)
Position [n(%)] ($n = 1016$)	Unit Manager	26 (13.5)	11 (4.8)	27 (10.7)	6 (8)	5 (1.9)	75 (7.4)
	Bed side Nurse	159 (82.8)	205 (88.7)	214 (84.6)	60 (80)	253 (95.5)	891 (87.7)
	Other ^a	7 (3.7)	15 (6.5)	12 (4.0)	9 (12.0)	7 (2.7)	50 (4.9)
Institution type [n(%)] ($n = 909$)	Public	60 (79.0)	143 (61.9)	251 (99.2)	67 (89.3)	263 (100)	784 (86.2)
	Private	26 (29.9)	25 (10.8)	0 (0)	6 (8.0)	0 (0)	57 (6.3)
	Other ^b	1 (1.1)	63 (27.3)	2 (0.8)	2 (2.7)	0 (0)	68 (7.5)
Satisfaction with the current job [n(%)] ($n = 1033$)	Very satisfied	36 (18.6)	90 (38.8)	62 (24.1)	6 (8.0)	97 (35.3)	291 (28.2)
	Somewhat satisfied	116 (59.8)	97 (41.8)	152 (59.1)	50 (66.7)	152 (55.3)	567 (54.9)
	Somewhat dissatisfied	35 (18.0)	34 (14.7)	25 (9.7)	18 (24.0)	19 (6.9)	131 (12.7)
	Very dissatisfied	7 (3.6)	11 (4.7)	18 (7.0)	1 (1.3)	7 (2.5)	44 (4.3)
Satisfaction with being a nurse [n(%)] ($n = 1033$)	Very satisfied	107 (55.2)	169 (72.8)	78 (30.4)	29 (38.7)	167 (60.7)	550 (53.2)
	Somewhat satisfied	74 (38.1)	41 (17.7)	144 (56.0)	42 (56.0)	77 (28.0)	378 (36.6)
	Somewhat dissatisfied	10 (5.2)	15 (6.5)	23 (8.9)	3 (4.0)	12 (4.4)	63 (6.1)
	Very dissatisfied	3 (1.5)	7 (3.0)	12 (4.7)	1 (1.3)	19 (6.9)	42 (4.1)

For each variable, the denominator includes the total number of respondents for each specific question, accounting for any missing values.

^aIncludes unit educators and other categories.

^bState-contracted institutions: the owner of the institution and the management is ruled by a private company, but the government has a contract with the institution to provide public healthcare.

statistically significant association was found between intention to leave with age, country and institution type. (Table 2).

When analysing work environment characteristics associated with intention to leave, lower job satisfaction, lower probability of getting the job done, lower frequency of enough and qualified staff, lower perception of quality of care provided, worse perception of the value placed by the organization on the nurse's own health and safety and greater moral distress were found (Table 3).

Specifically, it was observed that nurses who intended to leave reported a lack of time to develop their professional autonomy (comforting and talking to patients, developing or updating care plans, preparing patients and families for discharge and teaching patients or family) ($p < 0.05$). In all the AACN standards for achieving a HWE, better scores were perceived by nurses who showed no intention to leave ($p < 0.001$) despite all of them needed to be improved (Table 3).

Among nurses with no intention to leave ($n = 694$), 92.1 % ($n = 639$) were satisfied with their current job compared to those who wanted to leave (64.6 %; $n = 219$) ($p < 0.001$) (Table 3). On the other hand, 68.6 % ($n = 120$) of those who were not satisfied, planned to leave their job in the next year (28 %; $n = 49$) or the next three years (40.6 %; $n = 71$).

Reasons to reconsider leaving their job

Amongst the ICU nurses who wanted to leave their job ($n = 339$), the most relevant factors for reconsidering their decision were a higher salary and benefits (87.2 %; $n = 287$), better staffing (85.3 %; $n = 284$) and receiving more meaningful recognition (82.0 %; $n = 268$) (Table 4).

When comparing the relevance of these factors among sociodemographic characteristics, only some differences were found. Female participants, compared to males, considered better staffing (89.5 %; $n = 205$ vs 76.9 %; $n = 60$ male; $p = 0.009$) and the opportunity to influence decisions about patient care (74.3 %; $n = 165$ vs 60.3 %; $n = 47$ male; $p = 0.027$) more relevant. With regards to the country, Cyprus considered more importantly, having more respect from unit manager (Cyprus 87.9 %; $n = 51$ vs Spain 68.1 %; $n = 77$; $p = 0.011$) as well as from the administration (Cyprus 87.9 %; $n = 51$ vs Poland 65.8 %; $n = 25$; $p = 0.033$) and having flexible scheduling (82.1 %; $n = 46$ vs the lowest Poland 52.6 %; $n = 20$; $p = 0.001$).

Table 2

Demographic factors associated with intention to leave.

		No intention to leave $n = 694$	Intention to leave* $n = 339$	p
Gender [n(%)] ($n = 1019$)	Male	124 (60.8)	80 (39.2)	0.084
	Female	498 (68.1)	233 (31.9)	
	Prefer not to answer	64 (76.2)	20 (23.8)	
Age [mean(SD)] ($n = 967$)		38 (9.8)	35.9 (9.9)	0.002
Years of nursing experience [mean(SD)] ($n = 999$)		14.5 (14.9)	13.4 (10.3)	0.116
Years of experience in ICU [mean(SD)] ($n = 987$)		11.1 (9.2)	10.2 (9.1)	0.159
Institution type [n(%)] ($n = 909$)	Public	536 (68.4)	248 (31.6)	0.001
	Private	23 (40.4)	34 (59.6)	
	Other	39 (57.4)	29 (42.6)	
Country [n(%)] ($n = 1033$)	Cyprus	136 (70.1)	58 (29.9)	0<.001
	Spain	119 (51.3)	113 (48.7)	
	Croatia	170 (66.1)	87 (33.9)	
	Poland	37 (49.3)	38 (50.7)	
	Romania	232 (84.4)	43 (15.6)	

For each variable, the denominator includes the total number of respondents for each specific question, accounting for any missing values.

*Intention to leave was analysed joining intention to leave within 1 year and 3 years.

Table 3

Working environment characteristics associated with intention to leave.

		No intention to leave $n = 694$	Intention to leave* $n = 339$	p
Satisfaction with current job [n(%)] ^a ($n = 1033$)		639 (92.1)	219 (64.6)	0<.001
Frequency of moral distress [n(%)] ^b ($n = 1033$)		214 (30.8)	164 (48.4)	0<.001
AACN Standards [mean(SD)] ^c	Skilled Communication ($n = 1028$)	2.85 (0.64)	2.57 (0.68)	0<.001
	True Collaboration ($n = 1026$)	2.70 (0.66)	2.37 (0.64)	0<.001
	Effective Decision-Making ($n = 1030$)	2.82 (0.58)	2.57 (0.65)	0<.001
	Appropriate Staffing ($n = 1028$)	2.66 (0.68)	2.40 (0.71)	0<.001
	Meaningful Recognition ($n = 1028$)	2.67 (0.68)	2.35 (0.63)	0<.001
Capacity to get the work done at the end of a typical shift (75–100 % of work done) ^d [n(%)]	Authentic Leadership ($n = 1028$)	2.77 (0.68)	2.38 (0.69)	0<.001
	Direct patient care (medications, procedures, monitoring etc.) ($n = 998$)	583 (86.6)	271 (83.4)	0.172
	Comforting and talking to patients ($n = 982$)	367 (55.6)	145 (45.0)	0.002
	Developing or updating care plans ($n = 934$)	380 (59.7)	142 (47.8)	0.001
	Preparing patients and families for discharge ($n = 827$)	357 (65.0)	150 (54.0)	0.002
Having enough and qualified staff [n(%)] ^e ($n = 1033$)	Teaching patients or family ($n = 879$)	311 (53.5)	126 (42.3)	0.002
	50–100 % of the time	342 (49.3)	150 (44.2)	0.128
Organisation values ICU nurses' health and safety [n(%)] ^f ($n = 1033$)	Less than 50 % of time	352 (50.7)	189 (55.8)	
Quality of care for patients in the unit [n(%)] ($n = 1033$)	Excellent	355 (51.2)	116 (34.2)	0<.001
	Good	204 (29.4)	63 (18.6)	0.001
	Fair	378 (54.5)	191 (56.3)	
	Poor	91 (13.1)	69 (20.4)	
		21 (3.0)	16 (4.7)	

For each variable, the denominator includes the total number of respondents for each specific question, accounting for any missing values.

*Intention to leave was analysed joining intention to leave within 1 year and 3 years.

^aCategorized into very satisfied and somewhat satisfied.

^bCategorized into very frequently and frequently.

^cScore of each standard is calculated through the mean. Higher scores indicate higher level of agreement.

^dThe question, for each category, could be answered as follows: 0–49 % of work done; 50–74 % of work done; 75–99 % of work done and 100 % of work done. Table shows the results of ≥ 75 % of work done.

^eThe question could be answered: <25 % of the time; between 25–49 % of the time, 50–75 % of the time; more than 75 % of the time; all the time. Table shows the results aggregated into two groups: below 50 % of the time against 50 % of the time or more.

^fCategorized into strongly agree & agree.

Reasons for intention to stay

The most relevant factors that kept nurses working in their organization were salary and benefits ($n = 466$; 45.1 %) and the people they worked with ($n = 419$; 40.6 %). Differences were observed between

Table 4

Working factors that would make reconsider the intention to leave.

Working factors	(n = 339)
Higher salary and benefits (n = 329)	287 (87.2)
Better staffing (n = 333)	284 (85.3)
More meaningful recognition for my contribution (n = 327)	268 (82.0)
More opportunities for professional development (n = 331)	270 (81.6)
Better leadership (n = 326)	264 (81.0)
More respect from administration (n = 328)	253 (77.1)
More respect from unit management (n = 328)	252 (76.8)
More flexible scheduling (n = 329)	236 (71.7)
More opportunities to influence decisions about patient care (n = 324)	226 (69.6)
More/better equipment and technology resources (n = 330)	224 (67.9)
More autonomy (n = 325)	216 (66.5)

For each variable, the denominator includes the total number of respondents for each specific question, accounting for any missing values.

*Each factor was responded in a Likert scale of 4 points and the table shows the number of respondents who replied “very likely or somewhat likely” to each factor.

nurses with and without intention to leave. The only factor more relevant for those who wanted to leave their position was the job location (24.5 % vs 14.8 %; $p = 0.001$). Conversely, the factors more important to those who did not intend to leave their job were the people they work with (43.2 % vs 35.1 %; $p = 0.013$) and the manager of their work unit (7.3 % vs 2.4 %; $p = 0.001$) (Table 5).

In the multivariate analysis, all variables introduced in the model were independently associated with the intention to leave. The most important were the country, being Spain the country with higher risk of nursing turnover (OR 6.35), being male (OR 1.69) and having experienced moral distress more frequently (OR 1.72). In contrast, factors associated with the intention to stay were being older (OR 0.98) and being satisfied with the current job (OR 0.15) (Table 6).

Table 5

Influential work factors that keep nurses working in their current organization*.

	Total n = 1033	No intention to leave n = 694	Intention to leave** n = 339	p
Salary and benefits	466 (45.1)	319 (46.0)	147 (43.4)	0.430
People I work with	419 (40.6)	300 (43.2)	119 (35.1)	0.013
Patients I care for	270 (26.1)	183 (26.4)	87 (25.7)	0.809
Job location	186 (18.0)	103 (14.8)	83 (24.5)	0.001
Opportunities for professional development	168 (16.3)	109 (15.7)	59 (17.4)	0.487
Work schedule	160 (15.5)	100 (14.4)	60 (17.7)	0.170
Work environment	100 (9.7)	74 (10.7)	26 (7.7)	0.127
Manager of my work unit	59 (5.7)	51 (7.3)	8 (2.4)	0.001
Opportunities for advancement	41 (4.0)	32 (4.6)	9 (2.7)	0.131
Reputation of the organization	35 (3.4)	21 (3.0)	14 (4.1)	0.357
Meaningful recognition	30 (2.9)	16 (2.3)	14 (4.1)	0.101
Support for nurses	15 (1.5)	12 (1.7)	3 (0.9)	0.220
Level of staffing	12 (1.2)	9 (1.3)	3 (0.9)	0.407

For the variables included in this table, there were no missing values.

*Respondents could only mark the two most relevant factors.

**Intention to leave was analysed joining intention to leave within 1 year and 3 years.

Table 6

Binary multiple logistic regression of the factors related to the intention to leave the job.

	Categories	OR (IC95%)	p
Country	Romania	Ref.	
	Cyprus	2.844 (1.404 – 5.760)	0.004
	Spain	6.352 (3.684 – 10.988)	<0.001
	Croatia	2.505 (1.405 – 4.467)	0.002
	Poland	4.373 (2.139 – 8.944)	<0.001
Age	(per year)	0.976 (0.958 – 0.994)	0.011
Gender	Female	Ref.	
	Male	1.695 (1.122 – 2.560)	0.012
Moral distress	Occasionally or rarely	Ref.	
	Very frequently or frequently	1.723 (1.195 – 2.483)	0.004
Overall satisfaction with current job	Not satisfied	Ref.	
	Satisfied	0.152 (0.096–0.240)	<0.001

OR > 1: intention to leave the job. Model characteristics: Hosmer-Lemeshow 0.508; Cox & Snell R² 0.208; Nagelkerke R² 0.287. X² 180.366; $p < 0.001$.

Discussion

The findings corroborate previous research and provide new insights. One-third of ICU nurses intend to leave their job within three years, a result consistent with recent studies [13,34]. However, this figure is lower than the rates previously reported by AACN, which reached 50–60 % for intention to leave [25]. Notably, Spain and Poland approach these higher rates (48.7 % and 50.7 %, respectively). Nursing turnover is linked to work-related dimensions, including individual traits, job satisfaction, and work environment factors, which aligns with prior studies [6–8]. Certain factors have been identified as crucial for either retaining employees or prompting them to reconsider their decision to leave. In particular, ICU nurses tend to perceive the work environment as focused on colleague relationships rather than a broader, more comprehensive concept.

Factors influencing the intention to leave include age and gender, with younger nurses [35] and men being more likely to consider leaving, which confirms previous findings [36,37]. Country differences were significant, ranging from 15.6 % in Romania to 50.7 % in Poland [13]. To the best of our knowledge, no prevalence studies have specially focused on the countries included in our study within the ICU setting. However, international studies with global prevalence data, have reported similar findings to ours [7,34]. Moral distress was also associated with higher intention to leave, consistent with prior research [25,34].

Bivariate analysis revealed that difficulty in providing quality care or meeting care standards increased the likelihood of leaving, due to higher job dissatisfaction, as shown in other studies [38,39]. Furthermore, the most frequently missed care is the autonomous role of nursing, which involves caring for patients from a more humanistic perspective. The reduction in the ICU nurse's autonomous role negatively affects nurses' job satisfaction and increases their intention to leave [40].

Most of the highest-rated factors for reconsidering leaving were related to work environment conditions. Most of these factors were human-related, except for “higher salary and benefits”, which rated highest (87.2 %), and “more/better equipment and technology resources” at 67.9 %. These findings are consistent with AACN results [20], emphasizing the importance of the work environment in nursing retention. While our study could not explore these findings in depth, qualitative research supports our conclusions [15,41]. While salary matters [6], Hörberg et al. [42] argue it is a form of recognition, but not

the only one.

Interestingly, ICU nurses did not rank “work environment” (9.7 %) as a significant factor, but placed a high importance on “people I work with” (40.7 %). This suggests that ICU nurses may perceive the work environment primarily through the lens of colleague relationships rather than as a broader concept, though this requires further investigation. The work environment is, however, a multidimensional construct, shaped by the worker, management, and the organization [21,23]. Therefore, efforts should be strengthened to promote a better understanding of the work environment and to implement measures to improve it, considering the relevance it has in turnover amongst other important outcomes.

Regarding factors related to intention to stay, respondents were asked to select only the two most relevant, hence the percentage of relevance are not directly comparable to those related to reconsidering leaving. Notably, the factor that showed the greatest difference among ICU nurses with and without intent to leave, was job location (24.5 % vs 14.8 %; $p < 0.001$). This result is also supported by recent evidence on newly graduated nurses who highly value having a convenient job location [17,18].

All AACN standards received an average score below three, aligning with the AACN report [25]. Among ICU nurses not considering leaving, “appropriate staffing” received the lowest score (mean 2.66), whereas for those considering leaving, “meaningful recognition” (mean 2.35) had the lowest score. Overall, all standards were rated lower by nurses intending to leave, corroborating Ulrich et al. [25] findings.

Studies on newly graduated nurses show a shift in personal values, with a stronger focus on the work environment and work-life balance compared to previous generations [17–19,43]. Organizations and managers must consider these findings and potentially adjust how nursing staff are managed to prevent further attrition. This includes efforts to retain both experienced nurses and newly graduated nurses, who are crucial in addressing the ongoing nursing shortage [7,15,18]. Although some studies have explored interventions to improve nurse retention and the work environment, no clear conclusions have been reached. These interventions should be tailored to the specific needs of different populations [44–46].

Strengths & limitations

This study has several strengths and limitations. A key strength is the inclusion of ICU nurses from five European countries, with a substantial overall sample size. However, this can also be noted as a limitation as the characteristics of the included countries vary and they only represent a subset of European Union countries. Moreover, not all ICU nurses from the participating countries were reached when invitations were sent and participation was voluntary, representing a potential bias. Another strength is the investigation of both the intention to leave and stay, emphasizing the role of HWE in retaining ICU nurses.

Regarding other limitations, some data were lost due to missing responses on the intention to leave, likely due to the survey’s length. Additionally, demographic variables were at the end of the questionnaire, preventing analysis of whether incomplete respondents differed from complete ones. Data collection occurred during the COVID-19 pandemic, albeit not during the peak waves. While this may have influenced the results, recent studies have reported similar findings, mitigating the potential bias. Lastly, although ICU nurses in various roles were included, separate sub-analyses were not possible due to sample size. However, bedside nurses comprised 87.7 % of the sample.

Conclusion

One third of ICU nurses want to leave their position within the next 3 years, with Spain and Poland having the highest rates, nearly approaching 50 %. Factors independently associated with a higher intention to leave include the country, being younger, male and having

experienced moral distress more frequently.

Most factors related to the intention to leave the job and to stay are associated with the work environment. Institutions must recognize the critical role of the work environment in retaining ICU nurses and implement measures to improve it. These measures should be tailored to the specific needs of the nurses targeted and should involve their participation in the development process.

Ethical considerations

Ethical approval was obtained from the Cyprus Bioethical Committee (CNBC 2020.01.145) which was the coordinator of the project. On the first page of the questionnaire, information of the study was provided, and participants had to specifically give their consent to be able to access the questionnaire. Confidentiality was granted throughout the study. The questionnaire was anonymous, but in order to ensure that each participant only answered once, an alphanumeric code was created by each participant. The only person who could access the raw database and could see the anonymous codes was the statistician, who was not part of the research team. Codes were deleted for the analysis. This study is reported following the CROSS guidelines [33].

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Chat GPT 4.1 in order to check the language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

CRediT authorship contribution statement

Mireia Llauro-Serra: Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Estel Curado Santos:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation. **Marina Perpiñán Grogues:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Anca Constantinescu-Dobra:** Writing – review & editing, Methodology, Investigation. **Madalina-Alexandra Coțiu:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Beata Dobrowolska:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Adriano Friganović:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Aleksandra Gutysz-Wojnicka:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Maria Hadjibalassi:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Conceptualization. **Dorota Ozga:** Writing – review & editing, Methodology, Investigation. **Sladana Režić:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Adrian Sabou:** Writing – review & editing, Project administration, Methodology, Investigation. **Jelena Slijepčević:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Evanthia Georgiou:** Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.iccn.2025.103998>.

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