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Practice and clinical decision-making autonomy among Hellenic critical care nurses

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Background Nursing autonomy has been associated with better patient-outcomes; therefore, it is a priority for critical care nursing management. Low authority has been a persistent complaint of Hellenic intensive care unit nurses; however, issues of nursing autonomy have not been previously addressed empirically in Hellas.

Purpose To investigate: (1) the perceived contribution to clinical decision-making, (2) the degree of autonomy in technical tasks, and (3) factors related to practice autonomy in critical care nurses in Hellas. Additionally, because of the lack of sufficient tools, this study also aimed to construct and to validate a new tool for assessing practice and clinical decision-making autonomy among Hellenic intensive care unit nurses.

Materials and methods A Hellenic intensive care nursing autonomy scale, focused on technical aspects of care, was developed through literature review, a panel of experts and a pilot study in a random sample of 120 respondents. Items were refined by factor analysis, which revealed three major conceptual categories of autonomy: (1) basic technical, (2) advanced technical, and (3) clinical decision. Hellenic intensive care nursing autonomy (Likert 4, range: 38–152), was distributed to all nurses employed in intensive care units in Hellas ($n = 807$; attrition: 27%). Comparisons, correlation and multivariate regression were employed.

Results The Hellenic intensive care nursing autonomy scale exhibited appropriate reliability (Cronbach's $\alpha = 0.86$) and validity properties. Autonomy scores were moderate (mean: 105.24 ± 9.58). Highest autonomy was attributed to basic technical tasks, followed by advanced technical tasks and decision-making. Male gender and higher education were predictors of higher overall, advanced technical and decision-making autonomy ($P = 0.01$). Bachelor degree graduates scored higher in decisional autonomy ($P = 0.03$). Intensive care unit experience and type of intensive care unit were also important determinants of decisional autonomy ($P = 0.02$).

Conclusions The results revealed moderate autonomy in technical tasks and low decisional autonomy among Hellenic intensive care unit nurses. Factors related to the educational preparation of nurses, gender issues and institutional characteristics might hinder intensive care unit nurses' autonomy in Hellas.

Keywords: critical care nursing, gender, nursing autonomy, nursing education, nursing management

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Introduction

Nursing accountability for critically ill patients' outcomes increases, along with the complexity of critical care. Given the rising severity of critically ill individuals (Dematte D'Amico *et al.* 2003), nurses need to respond to increasingly complex and acute patient problems. Therefore, practice and clinical decision-making autonomy are global preconditions for supporting critical care nurses in fulfilling their caring responsibilities at an evidenced-based, quality and patient-centred manner (Wade 1999). Furthermore, decisional autonomy is a prerequisite in ethical decision-making. Consequently, fostering nursing autonomy is among the top priorities for intensive care unit (ICU) nurse managers. Nonetheless, nursing autonomy and its constituents, particularly in intensive care, still elude precise definition (Keenan 1998, Royal College of Nursing (RCN), Critical Care Forum 2001, Varjus *et al.* 2003). Additionally, the potentially wide variability in the delineation and boundaries of intensive nursing care among different institutions and different countries (Depasse *et al.* 1998); and the interdependent nature of the health care professions add to the confusion regarding critical care nursing autonomy.

Research evidence suggests that increased nursing autonomy in intensive care is associated with better patient outcomes (i.e. Kollef *et al.* 1997, Brook *et al.* 1999, Curley 2002, Luyt *et al.* 2002), as well as health outcomes in nursing personnel (Erlen & Sereika 1997, Budge *et al.* 2003). Additionally, increased nursing autonomy may be a factor in supporting evidence-based practice, since low nursing autonomy has been identified among the main barriers in implementing research results (Parahoo 2000). Moreover, nursing autonomy has long been identified as a major source of nursing satisfaction, and a factor in nurse retention (Scot *et al.* 1999).

Given the absence of data and of a consensus on what constitutes nurses' role in Hellenic ICUs (Merkouris *et al.* 2003), this study aimed to investigate nurses' autonomy regarding technical aspects of care in Hellenic ICUs. Specifically, the degree to which Hellenic ICU nurses autonomously perform specific common and specialized clinical tasks was explored, along with the degree of nurses' perceived contribution in clinical decision-making. Associations with nurses' characteristics and organizational elements were also explored. Autonomy can be viewed as encompassing practical, decision-making and moral dimensions (Wade 1999). Only practical and decision-making aspects were addressed in this study. Intensive nursing care is far more than a list of technical tasks, encompassing diverse dimensions ranging from nursing diagnosis to psychosocial support, and moral agency. Nonetheless, given the mostly technical and medically driven mode of care in Hellenic ICUs, clarification of the technical aspects of care must precede a more comprehensive investigation.

Background and literature review

Autonomy is a composite multifactorial phenomenon spanning a wide array of behaviours, hence, it resists precise definition. The comprehensive definition provided by Wade (1999) was adopted for this study: 'Professional nurse autonomy is defined as belief in the centrality of the client when making responsible discretionary decisions, both independently and interdependently that reflect advocacy for the patient'.

Autonomy is an essential antecedent of empowerment (Wade 1999, Suominen *et al.* 2001) and professionalism (Norris 1995, Wade 1999). Thus, the interest of nurse managers and researchers in the development of professional nurse autonomy has been persistent (Cutts 1999, Cole & Ramirez 2000), particularly in light of evidence that nurses may be an oppressed group (e.g. Fulton 1997).

In Hellas, as in many European countries (Heering 1996, Monaco & Bruziches-Bruziches 1999), nurses still strive to enhance their professional status by pursuing educational and practice autonomy. Furthermore, recently enacted Hellenic legislation decrees medical directors as accountable for all care provided in the unit, including nursing care. Thus, the enhancement of nurses' autonomy and professionalism has become a quite urgent issue for Hellenic nurses. As eloquently described by Patiraki-Kourbani (2003):

> 'Doctors and administrators in the [Hellenic] professional environment are dominant over nurses. The authority and expertise of nurses for clinical decision-making is not recognized, and

> nursing needs of patients receive low priority. […] Poor multiprofessional teamwork is a significant barrier to nursing professionalism'.

Empirical data on ICU nurses' autonomy are very scarce (Lauri *et al.* 2001, Varjus *et al.* 2003). Previous results on the organization of nursing care in Hellenic cardiac (Merkouris *et al.* 2003) and general ICUs (Plati *et al.* 1996) are indicative of great variation regarding performance of specific nursing tasks and educational background, factors that may have a considerable impact on nursing autonomy. In a recent study in Finland (Varjus *et al.* 2003), the majority of nurses reported more autonomy in relation to actions and decision-making concerning patient care than regarding issues related to unit operation. In an Australian study (Bucknall & Thomas 1997), lack of time, as well as inadequate knowledge base and personnel conflicts were the more frequent barriers to decision-making among critical care nurses. In a subsequent observational study, Bucknall (2000) located three main categories of nursing decisions in intensive care – intervention, communication and evaluation decisions. Factors including critical care experience, appointment level and shift work were involved in the frequency of these decisions.

Materials and methods

Design

An exploratory descriptive correlational design with additional cross-sectional comparisons was employed. The specific aims of the study were to explore: (1) the degree of practice autonomy among Hellenic ICU nurses, as reflected by the degree at which they autonomously perform specific nursing tasks, (2) nurses' perceived contribution to clinical decision-making, and (3) the association between characteristics of nurses and of the clinical setting and the degree of nurses' autonomy. Additionally, because of the lack of sufficient tools, this study also aimed to construct and validate a new tool for assessing practice and clinical decision-making autonomy among Hellenic ICU nurses.

Sample and setting

The study was undertaken by the Critical Care Section of the Hellenic Nurses' Association (HNA-CCS). The total population of the nursing personnel employed in critical care settings at the public and private sector in Hellas was targeted for inclusion in the study sample ($n = 1{,}020$). Nurses with managerial capacity and staff employed in auxiliary nursing services (supplies, clerical staff) were excluded, because of the specific nature of their posts. Furthermore, ICU units with less than four beds were not included, because of organizational and personnel deviations, such as staffing by general-ward nursing personnel by rotation. Data were collected from 41 acute-care hospitals, which included 53 ICUs.

Instruments

Because of the lack of appropriate and adequately transferable tools addressing practical aspects of nursing autonomy specifically for intensive care, a critical care nursing autonomy scale was developed. Hereafter, it will be referred to as Hellenic Intensive Care Nurses Autonomy (HICNA) scale. The HICNA is a 38-item scale based on Likert 4 self-administered questions. The HICNA items were followed by an 8-item questionnaire for background (demographic, employee and organizational) data. Nurses were required to score the perceived frequency at which they enjoyed autonomy in performing basic and advanced technical ICU tasks, and in contributing to clinical decision-making (1: never, 2: rarely, 3: sometimes, 4: always).

The HICNA content development was based on extensive review of the pertinent literature and of Hellenic ICU protocols and reports of common practice, through a panel of experts. Previous nursing autonomy scales were considered; however, mostly owing to the non-applicability of their contents to critical care, new items were developed. This early phase of development resulted in a 63-item tool which was further refined through pilot testing (120 randomly sampled critical care nurses), and validity and reliability analysis. Reliability analysis of the initial scale yielded suboptimal results (Cronbach's $\alpha = 0.67$, Split-half = 0.66/0.53); therefore, consequently, several items were deleted. The generated 38-item scale had appropriate reliability (Cronbach's $\alpha = 0.86$, Split-half = 0.81/0.76); and the panel of experts consented on its clinical relevance and applicability. Content validity was established through correlation with: (1) background factors (type of ICU, Pearsons's $r = 0.47$, $P = 0.01$; education, $r = 0.39$, $P = 0.01$; and ICU experience, $r = 0.53$, $P = 0.007$); and (2) general autonomy questions ($r = 0.6$–0.72, $P < 0.05$). Test–retest reliability was tested in a random sample of 10 responders. Pearson's r coefficient for test–retest responses ($r > 0.88$) and the McNemar test for significant differences between responses ($P > 0.1$) were evaluated.

A factor analysis approach was employed to reveal underlying subgroupings of the variables. The final model following a quatrimax rotation and retaining

Table 1
Categories of the Hellenic Intensive Care Nurses Autonomy (HICNA) scale, percentage of variance explained, and mean scores (±SD) at a sample of 803 Hellenic intensive care nurses (Likert scale; 1: never, 2: rarely, 3: sometimes, 4: always)

Category code	*Characterization (and number of items)*	*Percenrage of variance explained*	*Mean score (±SD) [average of Likert (1–4) ratings]*
1	Titration of medications and ventilatory adjustments (8-items)	18.438	3.86 ± 0.14
2	Standard catheter management (7-items)	10.726	3.25 ± 0.41
3	Haemodynamic measurements (4-items)	11.145	2.32 ± 0.70
4	Advanced catheter management (6-items)	10.843	2.09 ± 0.77
5	Admission/discharge decisions and therapeutic decisions (4-items)	7.392	1.41 ± 0.55
6	Delivery of information to family and patients (2-items)	6.937	2.11 ± 0.83
7	Performance of endotracheal extubation (2-items)	5.015	1.91 ± 0.84
8	Management of haemofiltration (2-items)	4.976	3.99 ± 0.002
9	Performance of defibrillation (1-item)	4.483	3.98 ± 0.004
10	Clinical assessment (3-items)	4.366	1.2 ± 0.80
Total		84.321	

only these variables with eingenvalue loadings >0.5, resulted in 10 factors, explaining 84% of the variability (Table 1). The resulting factors in order of percentage of variance explained were the following: (1) titration of medications and ventilatory adjustments (8-items); (2) standard catheter management (6-items); (3) haemodynamic measurements (4-items); (4) advanced catheter management (6-items); (5) admission/discharge decisions and therapeutic decisions (4-items); (6) delivery of information to family and patients (2-items); (7) performance of endotracheal extubation (2-items); (8) management of haemofiltration (2-items); (9) performing defibrillation (1-item); and (10) clinical assessment (3-items). Hereafter, the above factors will be referred to as categories of the HICNA scale.

The above categories of nursing autonomy fitted into three major conceptual groups: (1) Clinical Decision Autonomy (categories 1, 5–7, 10), (2) Basic Technical Autonomy (categories 2, 9), and (3) Advanced Technical Autonomy (categories 3, 4, 8). Hereafter, these groups will be referred to as dimensions of the HICNA scale. The dimension 'Clinical Decision Autonomy' involves items regarding the ability of nurses for both clinical reasoning and for implementing decisions (e.g. titration of medications, modification of ventilatory settings). The dimension 'Basic Technical Autonomy' includes standard care items; which even novice ICU nurses can master. The dimension 'Advanced Technical Autonomy' involves advanced care items, requiring higher degree of specialization (e.g. performance of haemodynamic measurements). The cumulative HICNA score, which is generated by summing the scores of all individual items, was regarded as a measure of Hellenic ICU nurses' practice autonomy. The HICNA score ranges from 38 to 152 (mean of scale: 95), while higher numeric values correspond to higher perceived autonomy.

Procedures

Permission to conduct the study was obtained by the Hellenic Nurses' Association – Critical Care Nursing Section Board and the nursing directors of the study institutions. No institutional review board approval was required for this type of study. Questionnaires were mailed to all Hellenic ICUs meeting the inclusion criteria, including short letters explaining the aims of the study, and asking for consent to participate. Confidentiality and anonymity were assured, as well as the right to decline participation. Questionnaires were returned anonymously, in sealed envelopes. Return of a completed questionnaire was regarded as equivalent to participant's consent to have the data included in the study.

Statistical analysis

Variable values were expressed as mean ± SD. A nominal significance level $\alpha = 0.05$ was used and Bonferroni adjustment was employed in case of multiple bivariate comparisons. The cumulative and average HICNA scores, as well as values corresponding to the discrete categories and dimensions of HICNA, were reported. Average scores were computed by averaging the Likert ratings for the corresponding items. Variables were tested for normality and were accordingly transformed where appropriate. Parametric (*t*-test, ANOVA) and non-parametric (Mann–Whitney *U*-test) comparisons between gender, education and type of hospital groups were performed. Pearson's correlation coefficients (r) were reported for bivariate associations. Chi-square, simple and multiple logistic regression analyses were employed to reveal group differences and correlations between variables. Multivariate regression models with dummy coding and the backward elimination procedure

were employed to explore the effect and interactions of multiple background factors on autonomy.

Results

Background data

Of the 1020 questionnaires mailed, 803 were returned within 6 months (attrition rate: 27%). Attrition was observed equally in metropolitan and non-metropolitan ICUs. Exploration of responders' characteristics (gender, education, age) suggested that the sample was representative of the nursing personnel employed in Hellenic ICUs. Sample characteristics are presented in Table 2. The HICNA reliability was confirmed in the study sample (Cronbach's α: 0.89; Split-half: 0.83/0.79). A chi-square cross-tabulation revealed significant differences in the educational preparation of male and female nurses, with higher percentages of male nurses being associate diploma or Bachelor degree graduates ($P = 0.014$). Furthermore, male nurses tended to have fewer years of nursing (5.98 ± 4.18 *vs.* 8.34 ± 5.90 years) and ICU experience (4.22 ± 3.15 *vs.* 5.78 ± 4.46 years) ($P < 0.0001$); however, there were no age differences between the two gender groups (31.13 ± 5.36 *vs.* 30.7 ± 3.8). More years of experience, both nursing and ICU, were reported by assistant nursing diploma graduates, followed by associate diploma graduates and lastly by bachelor degree graduates ($P < 0.0001$). Bachelor degree graduates were younger compared to nurses with non-academic educational preparation (28.77 ± 3.9 *vs.* 31.26 ± 5.14; $P < 0.0001$).

Table 2
Characteristics of the sample of 803 Hellenic intensive care unit (ICU) nurses investigated

Variable	*Minimum*	*Maximum*	*Mean ± SD*
Age	20.00	57.00	31.07 ± 5.09
Years of nursing experience	0.00	35.00	7.89 ± 5.68
Years of ICU experience	0.00	23.00	5.48 ± 4.26
Attribute			*Percentage in sample*
Gender			
Female			81
Male			19
Nursing studies			
None			1.7
Assistant diploma			31.3
Associate diploma			59.4
Bachelor degree			7.6
Nursing specialty			16.1
Master's/PhD			2.5/0.4
Type of intensive care unit			
General			50.6
Cardiac			26.7
Cardio-surgical			7.5
Paediatric			4.4
Other (neurosurgery, burn care)			10.2
Type of hospital			
National Health Care System			61.6
University			17.5
Veteran			11.1
Private sector			9.9

Autonomy scores

Cumulative HICNA scores were moderate, exhibiting a mean of 105.24 (±9.58), and ranging from 82 to 132. Average HICNA scoring (mean of average Likert scoring for each item) was 2.9 (±0.26). The highest average autonomy was observed with regard to the scorings of category 1 (titration of medications and ventilatory adjustments; 3.86 ± 0.14) and category 9 (performing defibrillation; 3.92 ± 0.06). Lowest autonomy scorings were attributed to categories 5 (admission/discharge decisions and participation in medical rounds) and 7 (performance of endotracheal extubation) (Table 2). Participants attributed highest ratings to their basic technical autonomy, followed by advanced technical autonomy, and lastly to decisional autonomy (Table 3). In Table 4, average autonomy ratings of individual scale items are exhibited. Lowest autonomy was reported in relation to: performing endotracheal intubation, extubation procedures, haemodynamic measurements, delivering information to relatives and arterial puncture.

Effect of background characteristics on autonomy ratings

Male nurses consistently tended to rate their perceived autonomy higher than female nurses, and they reported slightly higher cumulative HICNA scores (108.34 ± 10.4 *vs.* 104.47 ± 9.17; *P*-value (Mann–Whitney *U*-test, *t*-test) <0.003); and higher average autonomy ratings (3.1 ± 0.28 *vs.* 2.9 ± 0.25; *P*-value (Mann–Whitney *U*-test, *t*-test) <0.003). Male nurses rated their perceived autonomy in performing haemodynamic measurements (category 3), and in advanced catheter management (category 4) higher than their female colleagues (Mann–Whitney *U*-test, $P = 0.003$, $P < 0.0001$; respectively; Figure 1a,b). Additionally, male nurses reported extubating patients more frequently ($P < 0.0001$). These differences were significant even after Bonferroni adjustment for multiple comparisons. Regarding the three dimensions of autonomy, male nurses exhibited higher scores with regard to advanced technical autonomy (*P*-value (Mann–Whitney *U*-test, *t*-test) <0.05);

Table 3
Ratings assigned to the three dimensions of autonomy assessed by the Hellenic Intensive Care Nurses Autonomy (HICNA) scale, and comparison of male–female nurses; and bachelor degree (BSN)–associate diploma (AD) nurses (average Likert ratings ± SD) at a sample of 803 Hellenic intensive care nurses (Likert scale; 1: never, 2: rarely, 3: sometimes, 4: always; *$P = 0.03$; **$P = 0.01$)

Dimension of autonomy	*Mean of sample*	*Female nurses (male nurses)*	*BSN nurses (AD nurses)*
Decisional	2.14 ± 0.38	2.45 ± 0.38 (2.41 ± 0.41)	2.87 ± 0.36 (2.49 ± 0.4)*
Basic technical	3.25 ± 0.41	3.24 ± 0.42 (3.3 ± 0.38)	3.58 ± 0.31 (3.25 ± 0.41)**
Advanced technical	3.16 ± 0.25	3.14 ± 0.23 (3.23 ± 0.29)*	3.17 ± 0.17 (3.21 ± 0.25)

Table 4
Ratings (mean Likert ratings ± SD) assigned to specific items of the Hellenic Intensive Care Nurses Autonomy (HICNA) scale by a sample of 803 Hellenic intensive care nurses (Likert scale; 1: never, 2: rarely, 3: sometimes, 4: always)

Item	*Mean ± SD*	*Item*	*Mean ± SD*
Admission decisions	1.40 ± 0.65	Acquiring pulmonary artery pressure (PAP) readings	2.02 ± 1.15
Discharge decisions	1.55 ± 0.70	Acquiring pulmonary capillary wedge pressure (PCWP) readings	1.7 ± 1.01
Participation in collaborative therapeutic decisions	1.79 ± 0.15	Acquiring cardiac output (CO) readings	1.63 ± 0.94
Participation in medical rounds	3.49 ± 0.20	Evaluation of haemodynamic measurements	1.27 ± 0.87
Information delivery (patients)	2.25 ± 0.97	Administration/titration of analgesics	3.97 ± 0.04
Information delivery (family)	1.97 ± 0.91	Titration of vasoactive agents	3.67 ± 0.11
Assessment of clinical status	1.43 ± 0.42	Titration of sedative agents	3.89 ± 0.08
Assessment of cardiac/circulatory status	1.17 ± 0.89	Titration of neuromascular blocking agents	3.72 ± 0.13
Assessment of respiratory status	1.23 ± 0.93	Titration of antiarrhythmic agents	3.52 ± 0.19
Arterial puncture for blood drawings	3.99 ± 0.02	Performance of emergency defibrillation	3.99 ± 0.002
Acquiring blood samples for laboratory tests	3.32 ± 1.01	Management of renal dialysis	3.99 ± 0.03
Collecting specimens for blood cultures	2.99 ± 1.11	Management of continuous haemofiltration techniques	3.87 ± 0.1
Collecting specimens for bronchial culture	2.92 ± 1.14	Management of peritoneal dialysis techniques	3.91 ± 0.03
Insertion of peripheral venous catheter	3.31 ± 0.91	Adjustment of ventilatory settings	3.85 ± 0.09
Insertion of arterial catheter	2.35 ± 1.12	Decision to wean patients from ventilator	1.31 ± 0.92
Insertion of indwelling urine catheter (female)	3.19 ± 0.97	Management/performance of weaning procedures	3.09 ± 1.37
Insertion of indwelling urine catheter (male)	2.17 ± 1.06	Decision to extubate patient	1.51 ± 1.12
Insertion of nasogastric tube	2.40 ± 1.07	Performance of extubation procedure	2.32 ± 1.49
Acquiring central venous pressure (CVP) readings	3.33 ± 0.98	Performance of endotracheal intubation procedure	1.28 ± 0.54

which was further confirmed by logistic regression analysis. When controlling for level of education, age, and years of experience in the logistic regression model, gender remained a significant predictor of advanced technical autonomy scores ($P = 0.014$). In order to explore the effect of educational preparation on autonomy ratings, a one-way ANOVA for autonomy ratings by level of education (assistant, associate diploma and bachelor degree) was performed. Significant differences in cumulative HICNA scores ($P = 0.001$), average autonomy ratings ($P = 0.001$), as well as in basic technical autonomy ($P = 0.03$), advanced technical autonomy ($P = 0.004$) and decisional autonomy ($P < 0.0001$) were revealed among educational groups. Furthermore, significant differences among educational groups were observed in the average ratings of the following categories: 'titration of medications and ventilatory adjustments' ($P = 0.001$); 'standard catheter management' ($P = 0.04$); 'haemodynamic measurements' ($P < 0.0001$); 'advanced catheter management' ($P = 0.002$); 'admission/discharge decisions and participation in medical rounds' ($P < 0.0001$); 'delivery of information to family and patients' ($P < 0.0001$); 'clinical assessment' ($P < 0.0001$); and 'performance of endotracheal extubation' ($P = 0.001$). Bachelor degree graduates scored higher in decisional ($P = 0.03$) and basic technical autonomy ($P = 0.010$). Bachelor degree graduates rated their autonomy regarding 'titration of medications and ventilatory adjustments' ($P < 0.0001$), 'standard catheter management' ($P = 0.010$), 'haemodynamic measurements' ($P = 0.002$), and 'delivery of information' ($P = 0.007$) higher, while they scored lower in items regarding extubation procedures ($P = 0.010$). When controlling for gender and years of ICU experience, these differences were still significant.

A one-way ANOVA for autonomy ratings by type of ICU (general, cardiac, cardiac-surgical, paediatric) revealed significant differences among different types of units with regard to all autonomy categories ($0.003 \leq P < 0.0001$), and the three dimensions of autonomy ($P < 0.0001$). Among group contrasts revealed that cardiac surgery ICU nurses rated their basic and advanced technical autonomy higher than their colleagues in other adult units. The lowest overall

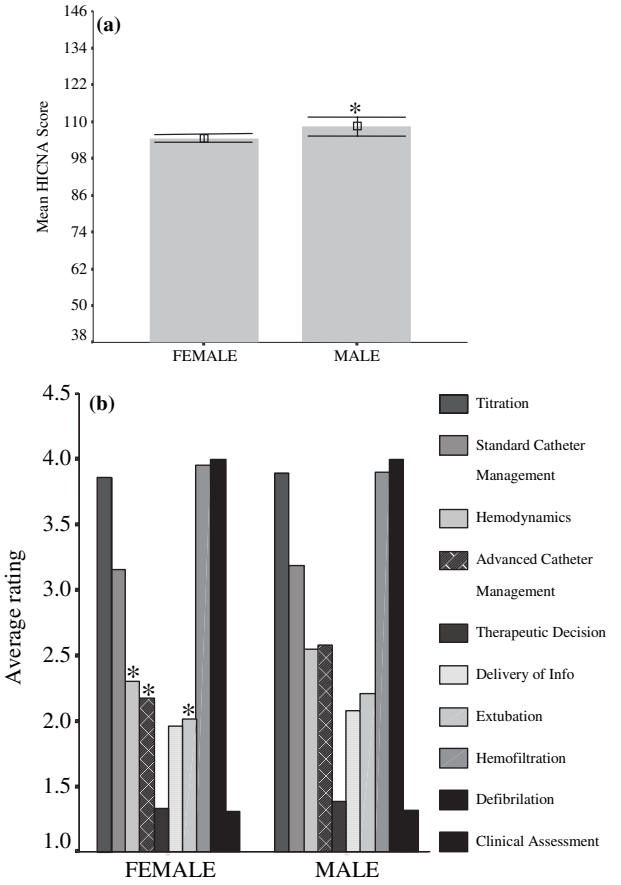

Figure 1
Differences in autonomy indices between male and female intensive care unit (ICU) nurses at a sample of 803 Hellenic ICU nurses. (a) Differences in cumulative Hellenic Intensive Care Nurses Autonomy (HICNA) scores; (b) differences in average ratings at the categories of autonomy (*$P < 0.002$).

autonomy regarding all three dimensions of autonomy was reported by paediatric ICU nurses (Figure 2). Similarly significant differences were revealed regarding cumulative HICNA scores, as well as decisional and advanced technical autonomy, among types of hospitals, with the highest autonomy being enjoyed by nurses employed in the private sector ($P < 0.001$); nonetheless, these differences were no longer significant after controlling for educational preparation. No differences were observed between metropolitan and non-metropolitan hospitals.

Acknowledging the probability of simultaneous effects and interactions, a multiple regression approach with dummy coding was employed. The final model included the following factors as predictors of cumulative HICNA scores: type of ICU, nurses' gender, years of ICU experience and basic nursing education level (Table 5a). The model showed evidence of significant contrasts between general ICUs and cardio-surgical units, and between associate and assistant nurses, as

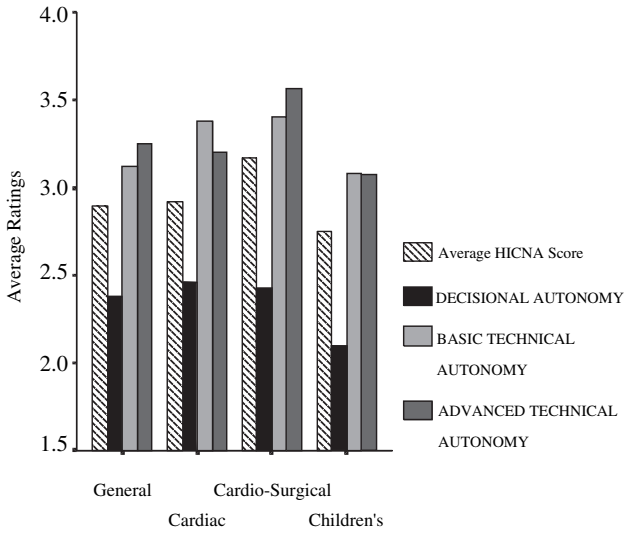

Figure 2
Average ratings regarding the overall Hellenic Intensive Care Nurses Autonomy (HICNA) scale and the discrete dimensions of autonomy reported by Hellenic nurses employed in different types of intensive care units.

Table 5
Multiple regression models for evaluation of predictors of autonomy scores assessed by the Hellenic Intensive Care Nurses Autonomy (HICNA) scale at a sample of 803 Hellenic intensive care nurses (dummy coded variable contrasts; type of ICU 1: comparison between general/cardiac and cardio-surgical units; type of ICU 2: comparison between general/cardiac and paediatric units; nursing education 1: comparison between assistant and associate diploma graduates; nursing education 2: comparison between bachelor and associate degree graduates)

	Unstandardized coefficients		*Standardized coefficients*	
Model	*B*	*SE*	*Beta*	*P-value*
(a) Dependent variable: cumulative HICNA score				
Constant	100.891	1.036		0.000
Type of ICU 1	4.493	1.844	0.135	0.015
Gender	4.139	1.307	0.176	0.002
Years of ICU experience	0.680	0.133	0.285	0.000
Nursing education 1	−3.396	1.223	−0.157	0.006
Nursing education 2	7.370	1.813	0.230	0.000
(b) Dependent variable: decisional autonomy				
Constant	2.394	0.029		0.000
Type of ICU 1	0.310	0.052	0.239	0.000
Years of ICU experience	0.014	0.004	0.148	0.000
Nursing education 1	−0.237	0.036	−0.271	0.000
Nursing education 2	0.138	0.056	0.1	0.015
(c) Dependent variable: basic technical autonomy				
Constant	3.227	0.019		0.000
Type of ICU 1	0.248	0.056	0.194	0.000
Nursing education 2	0.147	0.061	0.106	0.017
(d) Dependent variable: advanced technical autonomy				
Constant	2.756	0.029		0.000
Type of ICU 1	0.265	0.079	0.226	0.001
Type of ICU 2	−0.216	0.104	−0.140	0.038
Years of ICU experience	0.014	0.004	0.237	0.001
Nursing education 1	−0.148	0.036	−0.275	0.000

well as between assistant and bachelor degree nurses. 'Cardio-surgical units' and 'bachelor degree education' were associated with higher autonomy scorings; and 'assistant nursing education' was associated with lower autonomy scorings. Analysis of the generated intercepts and slopes gave evidence of interactions between the predictor variables. These results were confirmed by testing predictor models for average autonomy scorings.

Predictor models for decisional, basic technical and advanced technical autonomy were also tested. Type of ICU, educational background and years of ICU experience, but not gender, were significant predictors of decisional autonomy. The significant contrasts among ICU types and educational level were replicated as in the models above (Table 5b). Only types of ICU (cardio-surgical *vs*. general) and bachelor degree education (*vs*. associate nursing diploma) were significant predictors of basic technical autonomy (Table 5c). Additionally, type of ICU (general, cardio-surgical, paediatric), years of ICU experience, and education (assistant *vs*. associate nursing diploma), but not gender and bachelor degree diploma were significant predictors of advanced technical autonomy (Table 5d).

Discussion

The main findings of this preliminary investigation of issues of nursing autonomy in Hellenic ICUs were the moderate overall autonomy scores, especially with regard to decisional autonomy, and the association of gender, type of ICU and educational background to the degree of nurses' autonomy. This study differed from previous ones in the field by attempting to explore the technical aspects of care specifically. Low authority is a persistent complaint of intensive care nurses in Hellas (Tseroni *et al.* 2000). Furthermore, the use of the nursing process and diagnosis is almost absent in Hellenic ICUs (HNA-CCS, 2003, unpublished data), a situation which may relegate nurses' decisional and practice autonomy. The medically driven, task-oriented care in Hellenic ICUs, and the nursing work overload because of personnel shortage (Plati *et al.* 1996) foster a mechanistic delineation of nursing as a mere instrument for executing orders (Papathanassoglou *et al.* 2002). Therefore, acknowledging the comprehensive nature of nursing as one exceeding specific tasks and procedures is urgent and of paramount importance for planning and implementing change in Hellenic ICUs. The transition to more comprehensive and patient-centred modes of care requires a giant nursing management leap, for which nursing autonomy and empowerment are absolute prerequisites.

In this study, observed cumulative autonomy scores for technical tasks were above average, suggesting that Hellenic nurses may perform, autonomously, a long list of tasks that might not be considered traditional 'nursing' tasks. Interestingly, nurses tended to score lower in nursing communication tasks, such as providing information to patients and especially to family, than in tasks related to adjustments of medical therapy and to very specialized procedures. More specifically responders reported, on the average that they might provide information to patients and family 'rarely'; whereas, they reported that, almost 'always', they titrated a series of medications, adjusted ventilator settings, and managed procedures such as continuous haemofiltration, autonomously. Conversely, their autonomy in relation to haemodynamic measurements [except for central venous pressure (CVP) measurements], arterial puncture, and endotracheal extubation/intubation procedures was very low. Comparison of these observations with the results of a European survey (Depasse *et al.* 1998) involving 156 European ICUs in 17 European countries is worth-noting. Depasse *et al.* (1998) reported lower frequency of titration of medications and ventilator adjustments, and higher frequencies regarding extubation procedures. The frequencies of arterial puncture and insertion of peripheral intravenous catheters and arterial catheters were similar to those in this Hellenic sample. Moreover, Hellenic nurses appear to perform defibrillation more frequently since, on the average, they reported that they might 'always' perform emergency defibrillation autonomously. A presumed factor involved in the differences between these and previously reported European results is the length of time of doctors' presence in the unit; however, no such data were collected in the present study.

Despite the reported autonomy in technical tasks, Hellenic ICU nurses reported their decisional autonomy to be significantly lower, since, on the average they participated in admission, discharge, and therapeutic decisions less than 'rarely'. Likewise, Depasse *et al.* (1998) reported that only one-third of European ICU nurses participated in the decision to stop life support regularly. The discrepancy between technical autonomy and decisional autonomy is worth-noticing. One could presume that practitioners who are actively involved in life support procedures would be equally involved in decision-making. Naturally, this would be anticipated, only in the case when all tasks nurses were likely to be performed by nurses actually belonged to their jurisdiction. The observed discrepancy between technical and decision autonomy may suggest that nurses are simply 'allowed' to perform specific tasks, or that tasks

are transferred from doctors to nurses, because of workload or other factors. However, this is presumptuous and merits further investigation.

The low level of reported decisional autonomy in this sample is alarming, since clinical decision-making is a complex, constant and intensive aspect of ICU nursing. Bucknall's (2000) ethnographic observations support the central role of clinical decision-making in critical care nursing. She reported that ICU nurses were likely to make a patient care decision every 30 seconds, including a wide range of decisions from grand to trivial ones. Similarly, in a former investigation, Watson (1994) had reported that nurses made approximately nine important patient-care decisions per hour. Given the vulnerability and unstable condition of critically ill individuals, the final result of the manifold trivial and important decisions made by nurses on hourly basis may be crucial in defining patients' and family's outcomes. Moreover, nursing process itself, the most widely acknowledged tool for effective and comprehensive care-delivery, is an established method for making, implementing and evaluating nursing decisions. The ICU nurse managers in Hellas need to implement strategies to support and enhance nurses' decisional autonomy, since the informed and critical decision-making of nurses cannot be omitted or substituted.

Nonetheless, as shown by several investigators (Bucknall & Thomas 1997, Manias & Street 2001, Coombs 2003), medical dominance in critical care may continue to relegate and de-value nurses' input to clinical decision-making, even in countries where nursing has achieved a professional and academic status. More so, in Hellas, where nurses still strive for academic and professional recognition in the midst of health care politics that deprive them of control over their practice, education, and professional certification. Asserting clinical decision-making as a rightful nursing activity may threaten the power balance in the Hellenic Health Care System (Patiraki-Kourbani 2003). When adopting a passive stance, nurses may be hindered in acknowledging their own significant input to decision-making.

Manias and Street (2001) reported interesting ethnographic observations regarding covert ICU nurses' decisions masked under 'passive' specific suggestions to doctors. In this respect, questionnaires, as the one employed in this study, may only demonstrate nurses' perceptions of the formal and authorized forms of decision-making, and not of the equally important 'silent' decision-making that is actualized through concealed suggestions.

Communication and patient evaluation tasks were reportedly performed autonomously on the average 'never' to 'rarely' by the responders, which may differ from reports in other countries. Bucknall (2000) differentiated among three types of decisions made by Australian ICU nurses: intervention, communication and evaluation decisions, with patient evaluation and communication decisions to be the most frequent. Although not directly comparable with ours, these results may suggest different weights attributed to nursing tasks between the two samples. Hellenic nurses appear to be more occupied with executing technical tasks, the implementation of which may have not been decided by nurses themselves – and rarely with communication and patient evaluation procedures. This discrepancy is better understood by keeping in mind the educational preparation of Hellenic nurses. The majority of graduate nurses in Hellas, today, are graduates of 3-year nursing programmes offered at the Institutes of Technological Education (TEI), characterized by technically and not theory-oriented curricula. The TEI graduates have received minimal training in autonomous patient evaluation, and clinical decision-making. As detailed in results, the majority of the sample consisted of TEI graduates, and non-registered auxiliary personnel holding assistant nurse diplomas; whereas, a small minority were bachelor degree graduates. Bachelor degree graduates are a quite recent addition to the Hellenic nursing workforce. The School of Nursing at the University of Athens (UoA-SoN) is the only Hellenic nursing school leading to a Bachelor degree in nursing after eight semesters of study, admitting approximately 100 new students per year. The UoA-SoN brought an important novelty to nursing education in Hellas, by focusing on autonomous patient evaluation, nursing diagnosis and nursing process skills, as well as on clinical decision-making (UoA-SoN 2003). The pronounced differences in autonomy indices among ICU nurses with different educational backgrounds may be attributed to the differential focus of the educational institutions of origin. Bachelor degree graduates exhibited higher autonomy with regard to decision-making and basic technical skills. This advancement of Bachelor graduates, despite their comparatively fewer years of nursing experience and younger age, may be attributed to their stronger knowledge base and the competency in decision-making and patient data interpretation acquired through the academic programme. In line with these findings, Girot (2000) reported increased ability for clinical decision-making among British Bachelor degree nurses compared with their non-academic colleagues. Similarly, in a 1988 meta-analysis (Johnson 1988), BSN graduates were found to score higher in knowledge, problem-solving, communication skills and professional role, than nurses with no academic background.

Consequently, a question arises in reference to the high degree of autonomy reported by associate diploma graduates and auxiliary nursing personnel in relation to highly specialized procedures, such as haemofiltration. Despite the fact that these procedures call for high degree of technological know-how, at the same time, they require sound physical assessment and nursing diagnosis skills. When allocating personnel, nurse managers must consider not only the staff's experience with equipment, but also patient assessment needs. Another factor presumably involved in Bachelor degree nurses' higher autonomy scores is increased motivation, since an association appears to exist between job motivation and perceived autonomy (Marion *et al.* 1995). Nonetheless, in the absence of any data on motivation, no such inferences can be made from the present sample.

The positive association between the length of ICU experience and autonomy may be understandable on the basis of both increased knowledge and psychomotor skills, and the ability to handle more efficiently the hierarchical relationships of the unit. Similarly, ICU nurses' experience was associated to nursing decision-making in a Finnish study (Lauri & Salantera 1995). Presumably, the association between type of ICU and nursing autonomy reflects differences in unit procedures and organization. Nonetheless, the effect of unit procedures and diagnostic categories on the actualization of nursing autonomy needs to be investigated.

One of the most intriguing findings was the effect of nurses' gender on their reported autonomy. Male nurses reported higher autonomy, despite their comparatively fewer years of experience, and this effect remained significant even after controlling for educational level. These results are in accordance with those of previous investigators (Schutzenhofer & Musser 1994), in a general nursing population in the USA. Although, increased autonomy of male employees may be understandable on the basis of gender characteristics, and social norms, especially in the Mediterranean (Patiraki-Kourbani 2003), the issue of male authority and autonomy in nursing has not been sufficiently studied. Several reports support that men are more likely to build a successful career in nursing and to achieve high status as managers and researchers (Boughn 2001, Whittock & Leonard 2003). Although our results suggest higher overall autonomy in male nurses, gender was not a significant determinant of the scores achieved in each of the three dimensions of autonomy studied, when other factors were considered. This may suggest that male gender is not associated, specifically, with particular advancements in decisional or technical autonomy. Issues of male authority/autonomy in Hellenic ICUs need to be explored by focused interpretative and empirical investigation. Nurse managers have to assure that female nurses are not further burdened by the preeminence enjoyed by their male colleagues.

When exploring multiple regression models, nursing education, ICU experience, gender and type of ICU were all associated with autonomy ratings. This finding may suggest that in order to foster Hellenic ICU nurses' autonomy, policy makers and nurse managers have to address all the aforementioned four factors simultaneously.

Limitations

This study was a preliminary investigation of critical care nursing autonomy in Hellas and it contains several limitations mainly stemming from the tool employed, which was a novel instrument with low comparability with previously used tools. However, concurrent administration of the HICNA questionnaire with an established autonomy tool would be unlikely to enhance the design, because of differences in scope between this and previous tools. The design focused predominantly on technical aspects of care, leaving out the equally important aspects of ethical decision-making, planning, and accountability for care, as we deemed that exploration of the practical aspects of care was a prerequisite for a more comprehensive evaluation. In the future, more detailed organizational data of the units (e.g. protocols, nurse/patient ratios) may need to be collected. An additional problem was the amount of attrition, which might have biased the results. Nonetheless, attrition did not alter the distribution of background characteristics in reference to the target population. Furthermore, methodological triangulation with more naturalistic forms of data collection (i.e. observation, interviews), would, presumably, enhance the depth of exploration.

Conclusions and implications for nursing management

The results revealed moderate autonomy in technical tasks and low decisional autonomy among Hellenic ICU nurses. Organizational factors, as well as gender issues, educational preparation and years of ICU experience influence the actualization of nursing autonomy. Increasing nurses' autonomy in the medically driven critical care environment in Hellas may require a paradigm shift towards more inclusive and collaborative modes of care.

Actions to increase nursing autonomy in ICUs need to be implemented and endorsed at a national as well as at

a regional level. The ICU nurse managers have to ensure 'a nursing contribution to decision-making at all levels of policy development and implementation', and to address 'the obstacles, in particular recruitment policies, gender and status issues, and medical dominance' for actualizing nursing autonomy (Munich Declaration 2000). Specifically, ICU nurse managers in Hellas may need to consider:

- Increasing the allocation of BSN graduates in ICUs.
- Fostering nurses' autonomy by enabling them to exercise clinical decision-making, first in 'safe' environments, such as nursing rounds, and then by implementing multiprofessional teams.
- Actively supporting nursing decisions and nursing accountability.
- Implementing the use of the nursing process at all levels of care.
- Providing continuous in-service education to increase nurses' knowledge base.
- Implementing clinical protocols that may enhance nurses' autonomy and resisting 'traditions' that relegate nurses' autonomy.

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