An international e-Delphi study to identify core competencies for Italian cardiac nurses

INTRODUCTION

Due to rapid advances in science, technology, medicine and nursing, cardiac nurses need to update, redefine and align their practice and education with the best available international evidence and standards. This is necessary to ensure optimal care for the increasing number of people affected by cardiovascular disease, many of whom are often admitted and readmitted to hospital, but also increasingly, especially in the case of heart failure, cared for in the community.[1] Nurses play a central role in the education and support of patients and families with cardiovascular diseases.[2]

Considering the impact that cardiovascular diseases have on the population, especially, and today's technological innovations and scientific progress, international scientific associations have published position statements that define the core curriculum for cardiac nurses, setting standards of reference that also enable nurses to self-assess their own competence.[3] By 'competence' we mean 'the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and community being served'.[4] The term competence was first applied to other skills-based occupations and then adopted by nursing.[5] The term 'competency' (plural 'competencies'), which is the focus of this study, refers to the specific components of competence.

To provide a detailed list of the competencies that cardiac nurses should meet, the principal European Society of Cardiology (ESC) associations, such as the Heart Failure Association (HFA) and the European Association of Percutaneous Cardiovascular Interventions (EAPCI), have drafted position statements principally to define standard competencies under the form of a core curriculum. The ESC Association of Cardiovascular Nursing and Allied Professions (ACNAP) has produced various position statements with a list of specific competencies and healthcare standards required to care for patients affected by cardiovascular diseases.[6] A large study conducted in nine European countries showed how care provided by nurses with higher levels of education

significantly reduces the risk of mortality.[7] The purpose of a core curriculum for the management of cardiovascular diseases is to provide a framework for all the countries that are part of the Education Committee of the former Council (now Association) of Cardiovascular Nursing and Allied Professions (CCNAP), to enable cardiac nurses to work and collaborate in a fully integrated manner with other health professionals through an evidence-based approach.[8] In 2016, the Education working group of the nurse and allied professions committee of the European Association of Percutaneous Cardiovascular Interventions (EAPCI), through Benner's 'stages of clinical competence',[9] identified and listed the competencies that cardiac catheterisation laboratory nurses should have to manage specific clinical conditions, such as coronary artery disease, heart rate management, and structural heart disease. The common denominator of these position statements is the definition of the cardiac nurses' scopes of practice, which not only includes aspects related to clinical practice (e.g. reading and interpreting an ECG, monitoring vital signs, etc.), but also specific aspects of the nursing profession, such as non-technical skills, especially communication and relational skills.[8]

The development of guidelines (e.g. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure) highlights the importance of the nurse's role in the effective management of cardiovascular diseases.[10] However, the roles and responsibilities of cardiac nurses vary greatly across Europe, due to the geographical influence of their workplace, their educational preparation and the professional regulations of their country.[11] In Italy, for instance, unlike many other European countries, there are no postgraduate academic courses on specialised advanced competencies for cardiac nurses. In fact, Italian cardiac nurses gain their advanced competencies directly in the field, through their clinical experience.[12] Therefore, in this study we aimed to identify a set of internationally accepted core cardiac nursing competencies that would serve as the basis for specialist postgraduate courses, for cardiac nurses in Italy.

Aim

To identify a set of core competencies for cardiac nurses in Italy that meet international standards for postgraduate specialization courses.

METHODS

The Delphi survey

The Delphi technique is a widely used and accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts in certain topic areas.[13] Described by Dalkey and Helmer[14] as a method to obtain the most reliable consensus of a group of experts by a series of intensive questionnaires interspersed with controlled feedback, the main premise of the Delphi method is the assumption that group opinion is more valid than individual opinion. While the participants do not interact directly with one another in the process of a Delphi study, consensus is achieved because participants can change their opinion as a result of seeing the combined responses of the other participants. As described by the 'Better Evaluation' website,[15] the Delphi technique is a quantitative method aimed at generating consensus. It solicits opinions from groups in an iterative process of answering questions. The Delphi technique works using a multi-staged survey.[16] After each round the responses are summarised and redistributed for consideration in the next round. Through a process of convergence involving the identification of common trends and inspection of outliers, a consensus is reached. The Delphi method has been frequently and effectively used in healthcare to obtain consensus around priorities for education, research and service delivery [17-20] and is entirely suitable for the present project.

In each round of a Delphi survey, a summary of the results of the previous round is included and evaluated by the panel members. McKenna implies that this process facilitates the 'systematic emergence of a concurrence of judgement/opinion' (p. 1222).[16] The number of rounds depends on the time available and whether the study started the Delphi sequence (Round 1) with one broad question or with a list of questions or events. The process raises the question of how many rounds it takes to reach consensus. The classical original Delphi used four rounds. However, this has been

modified by many to suit individual research aims and, in some cases, it has been shortened to two or three rounds. It is difficult to retain a high response rate in a Delphi survey that has many rounds; the topic needs to be of special interest to the panel members.

The advantages of the e-Delphi are obvious; not only is it an environmentally friendly way to carry out research, it leads to more rapid feedback to, and responses from, panel members. In addition, reminder e-mails can be sent out automatically, and there is no cost in terms of postage or printing. Furthermore, busy respondents seeing one page at a time is perceived as being easier to complete than a full printed questionnaire.[21] For the purposes of the present study international experts in clinical teaching will be identified and considered to be potential participants in the study.

Participants

A group of 15 cardiac nurses from the UK (n=8), Canada (n=3), Australia (n=3), New Zealand (n=1) and 17 from Italy were selected by an international panel of advisers and accepted to participate on a voluntary basis. The characteristics of the participants who provided their demographic details are summarised in Table 1.

Sample size, selection criteria and duration of study

There are no formal criteria for determining either the number of people required for a Delphi study as this is a mixed methods approach, which has elements of both qualitative and quantitative research.[22] While as few as three participants have been used, the recommended minimum number of participants is eight.[22] Similarly, there are no formal criteria for selecting participants in a Delphi study other than that they should be recognised experts in the field of the study.[22] In the present study, we selected Italian and internationally recognised experts in cardiac nursing based on the recommendation of our expert advisory panel; the members of our advisory panel did not participate in the Delphi study. We used Italian experts as the study aimed to provide competencies for Italian nurses and we decided to include international experts to investigate whether there was congruence between national and international experts. We considered that this could lend greater

credibility to the outcome of the study. Finally, there are no formal criteria for deciding how many rounds of a Delphi study should take place. Some studies have used the reduction of standard errors around mean consensus scores[23] and the recommendations for achieving consensus range from 50-80%.[22] However, the decision of where to stop returning to experts remains arbitrary. Without exception, all the studies we used as background for the present study used three rounds. One factor which also helps to determine the number of rounds is the likelihood of diminishing returns whereby the number of participants responding between rounds declines. It is unreasonable to expect any research participants to commit to multiple rounds of any study; 'research fatigue'[24] is inevitable, and this is especially true of the kind of people required for participation in a Delphi study.

Procedure

For the present project we followed the method described in a recent study[25] and, specifically, used an e-Delphi method in three rounds, which were conducted between April 2016 and February 2018.

Round 1

For round 1, each participant was invited to propose a minimum of five competencies, which they considered should be included in a list of statements of common clinical procedures. To obviate an extensive list being presented to participants in round 2, a list of approximately 20 competencies was prepared by examining those obtained in round 1 and rationalising these based on their frequency. Some items were similar, or procedures overlapped, and this was used to rationalise the list.

Round 2

A prioritized list of 14 competencies from round 1 was sent to each participant. Each participant was requested to state how important, in terms of priority, each competency was on a ten-point scale. Scores 1-3 represented the region where participants considered the item was not a priority;

4-6 represent the region of equivocality; and 7-10 represent the region where it is considered that the item is a priority. Strict agreement was obtained if all rankings fell within one of these regions. Once analysed, items for which 70% of participants did not rate within the scale of 7-9 were removed. These results were then fed back to the experts, who remained anonymous from one another—for round 3.

Round 3

In round 3, participants ranked the competencies using the same ten-point scale but this time with knowledge of the group scores. Thus, participants reflected on their score and had the opportunity to change theirs depending on the group score whilst also maintaining anonymity from one another. In this round all the competencies presented were scored within the 7-10 region by 70% of the respondents so all were retained.

RESULTS

Round 1

In round one, 32 respondents (17 Italian; 15 international), were asked to identify a group of at least five competencies they considered important for nurses working in cardiac care to possess. Each respondent provided between five to ten competencies, which in the end were summarized to generate a list of 14 competencies (Table 2).

The most frequently mentioned competencies, both by international and Italian cardiac nurses were: 'ECG skills'; 'Health promotion'; 'Taking patient history and physical examination'; and 'Knowledge about cardiac pharmacology, interventions and heart diseases'. Some differences were observed in the number of times each competence was mentioned by international and Italian cardiac nurses were related to: 'Leadership skills (international = 1; Italian = 10); 'Healthcare process' (international = 0; Italian = 7); 'Organizational skills (international = 0; Italian = 7); and 'Advanced education and training' (international = 13; Italian = 0). Two competencies that were least mentioned by both international and Italian nurses were: 'continuing professional

development' (international = 1; Italian = 0) and EBP / Reflective practice (international = 1; Italian = 0).

Round 2

From this list, a prioritised list of competencies was generated in Round 2; 29 participants responded (12 international; 17 Italian) and the outcome is shown in Table 3. Very similar mean scores were obtained for 'Knowing how to assess and deal with signs and symptoms' (international = 9.6; Italian = 9.7); 'Knowledge about cardiac pharmacology, cardiac interventions, anatomy & pathology of the heart' (international = 9.0; Italian = 9.3); ECG Skills (international = 9.2; Italian = 9.0); 'Taking Patient history and physical examination' (international = 9.0; Italian = 9.2); 'Communication Skills' (international = 9.0; Italian = 8.8); and 'Heath care process' (international = 8.8; Italian = 8.7).

Instead, the most divergent mean scores between international and Italian experts were obtained for 'Evidence based practice' (international = 7.3; Italian = 9.1), 'Organizational skills' (international = 8.2; Italian = 6.5), 'Advanced education and training' (International 7.7; Italian 9.2) and Leadership skills (international 7.7; Italian 9.0).

Round 3

Table 4 shows the outcome of round 3, where the rankings of other experts were revealed, to which 26 participants responded (16 Italian; 10 international). At all stages, we compared the results from the Italian and the international respondents, and their prioritization of competencies was very congruent, therefore outcomes were merged to produce the final list.

When comparing the priority given by Italian and international respondents to each competency, there were some differences between the two groups for 'Knowledge about cardiac pharmacology, cardiac interventions, anatomy & pathology of the heart' (international = 7.9; Italian = 9.3); 'Taking patient history and physical examination' (international = 8.0; Italian = 9.1), 'Advanced education and training' (international = 8.1; Italian = 9.2), and 'EBP' (international =

7.3; Italian = 8.8).

DISCUSSION

We set out to identify a set of core competencies that meet international standards for postgraduate specialization courses for Italian cardiac nurses. To achieve our aim, we consulted experts within Italy and internationally. Remarkable congruence was attained between the Italian and international experts, so we decided to merge and not to differentiate these responses. The most highly rated standards were those related to immediate assessment and diagnosis of the patient. An accurate initial patient assessment enables more effective care planning. This is done by applying intervention algorithms in the event of acute diseases, such as myocardial infarction, but also for chronic diseases, such as heart failure, where specific pathophysiological and pharmacological aspects must be known in order to provide the best possible support to help patients and their carers manage the disease. Knowing the principal assessment scales, also in relation to habits and lifestyle, enables a multidimensional and multiprofessional assessment and, consequently, the grading of the patient's disease, enabling the necessary interventions in the short and in the long term to be planned[26] Also, communication skills and health promotion were highly rated. A cardiac event is an anxiety-provoking time for a patient, and cardiac nurses need to be able both to obtain information from a patient and to assure them about the future with sound advice on lifestyle changes they can make. The inclusion of instruments and techniques for therapeutic consultation that enable the identification of patients who are at medium-high risk in advanced courses for cardiac nurses, would enable better outcomes in terms of adherence to treatment.[27] The lower rated standards were related to more peripheral, yet still important aspects, of the cardiac nurse's role; for example, management and evidence-based practice.

Cardiac nurses need to be highly prepared for their role and are expected to demonstrate a high degree of autonomy in practice and to manage patients without, necessarily, recourse to their medical colleagues and show leadership to their other non-specialist nursing colleagues. In the

Italian context, the need for these standards arose because no such specific standards exist in Italy. This study highlights how the skills required by cardiac nurses are very advanced and specific. Officially recognized specialization courses for cardiac nurses are available in many European countries. Instead in Italy, cardiac nurses develop their specialist skills mainly during their clinical practice, by learning in the field, with the help of more experienced colleagues.[13]

The availability of standards of reference (or benchmarks) allows healthcare organizations to place nurses in cardiology services/settings, following a specific period of coaching or supervision, support and guidance by a specially trained nurse, with specific learning objectives that are in line with European standards. Nurses play an important role in the education and management of patients with a variety of cardiac conditions such as heart failure which, being chronic disease conditions, tend to get worse, often requiring the implantation of devices and remote telemetry, which require nurses to have advanced knowledge and skills.[28]

In Italy, there is no specialist training in cardiac nursing recognized at university level (e.g. no post-graduate courses in cardiac nursing). However, ACNAP offers its international audience the opportunity to attend webinars on clinical aspects and incentives to participate in educational conferences, as well as the provision of guidelines for cardiovascular nursing in many languages. Therefore, in countries where there are no specialist courses in cardiac nursing, ACNAP can help address this gap through its various learning resources and materials based on international standards. In centres where there is a greater degree of professionalism, for example, such as adequate staffing levels, degree-level preparation, length of service and years of experience in a specific clinical branch, there is a positive impact on the most important outcomes, such as mortality or readmission rate. [7]

European standards

The competencies identified in this study are congruent with those described in the core curriculum of the Heart Failure Association of the European Society of Cardiology, where knowledge about

cardiac physiology, cardiac pathophysiology, health promotion and pharmacology are included in the fundamentals of cardiovascular pathophysiology.[29] According to European standards, the correct identification and recording of heart rate and signs and symptoms, and a precise collection of the patient's clinical history, is not only fundamental but a mandatory requirement for the correct management of the patient.[30] Communication skills play a key role in facilitating adherence to treatment and involvement of patients and their families in their care.

It should be acknowledged that the list of competencies is a disparate range of specific clinical skills (e.g. ECG interpretation), very broad and generic skills (e.g. communication), and relatively vague and all-encompassing attributes (e.g. advanced education). There is also substantial overlap, for example, similarities between assessing signs and symptoms and taking a patient history. It is also evident that some aspects of cardiac nursing care are missing such as assessment of quality of life, including the patient's social, relational, emotional and sexual well-being.[31]

The way ahead

To implement the standards in cardiac nursing, it would be useful to have a uniform postgraduate educational curricula and provide, for instance, self-assessment tools and online courses on specific topics (e.g. heart failure, acute myocardial infarction, interventional cardiology) similar to the European Society of Cardiology. In relation to this, there are various organizations that offer specialized training for cardiac nurses, with seminars and online lessons, which facilitate the acquisition of new knowledge and specialized competencies, and at the same time offer the opportunity, through various projects, to be mentored by tutors and obtain grants.[32,33] However, it should be noted that the language barrier often discourages nurses who are not proficient in English to understand, fully, online courses and resources, which are mostly in English.

The United Kingdom Nursing & Midwifery Council declared that Registered Nurses play a vital role in providing, leading and coordinating care that is compassionate, evidence-based, and person-centred. They are accountable for their own actions and must be able to work autonomously,

or as an equal partner with a range of other professionals, and in interdisciplinary teams. To respond to the impact and demands of professional nursing practice, they must be emotionally intelligent and resilient individuals, who are able to manage their own personal health and wellbeing and know when and how to access support.[34]

Another important aspect is multidisciplinary team working, where physicians and nurses collaborate, and together assess and plan care for their patients, to favour adherence to treatment and care.[35] An integrated patient care plan enables better patient management and outcomes.[29]

Limitations

An inherent limitation of the Delphi technique is the use of a non-random sample with regard to the members of the panel of experts.[21] The experts were selected for a specific purpose, and not randomly, therefore the representative nature of the sample cannot be assured. In addition, some experts that took part in our study might have known one another and could have exchanged their views and influenced their responses to the e-Delphi. Another limitation could have been the long duration of the study, almost two years, because of the difficulty getting feedback by some experts who were often very busy, but we preferred to grant more time to minimize dropout.

Conclusion

This study provides a foundation for the development of postgraduate educational programmes for specialist cardiac nurses that are congruent with international standards. The standards of reference could also guide Italian academics in designing postgraduate advanced education courses that reflect a new vision of care, which does not only limit itself to clinical aspects but also takes into account how cardiovascular diseases impact on the population in terms of, for example, economic and social disparities.

Having a list of core competencies for cardiac nurses enables planning for personalized care and fostering new pathways that improve patient outcomes and experience. This also contributes to

the drafting of job descriptions and the establishment of new forms of service organisation and delivery, such as nurse-led heart failure clinics.[36]

IMPLICATIONS FOR PRACTICE

- Identifying and mapping cardiac nurses' competencies enables the design of more advanced educational programs and identify gaps.
- Core competencies can be used as a benchmark for cardiac nurses.
- Such educational programs are likely to contribute to improved patient outcomes.

ACKNOWLEDGEMENTS

We thank our international (Felicity Astin, Mark Hayter, Kathryn King-Shier, Geraldine Lee, and Hugh McKenna) and Italian (Beatrice Magno and Gian Battista Danzi) advisors who selected the International and Italian expert panels and supported this study. We also thank the expert cardiac nurses who generously responded: Benedetta Arena (Italy); Sabrina Barro (Italy); Paolo Bottoni (Italy); Lorenzo Ciarma (Italy); Matteo Chiarabelli (Italy); Louise Clayton (UK); Antonella Corona (Italy); Sara Covi (Italy); Cristina Danza (Italy); Julia Decourcey (UK); Maurizio Di Renzo (Italy); Marco Facchini (Italy); Ting Fang Feng (UK); Francesco Germinal (Italy); Jane Hannah (New Zealand); Kelly Hanvey (Australia); Ian Jones (UK); Heather Leblanc (Canada); Catherine McIntyre (Canada); Tania Massey (UK); Rosa Miccoli (Italy); Fabio Negrello (Italy); Nunzio Panzera (Italy); Ivana Pastorino (Italy); Simonetta Predolini (Italy); Deborah Wright (Australia); Armanda Zerbini (Italy)

Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

Funding

No funding was obtained for this study.

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Table 1
ROUND 1 DELPHI – MERGED LIST OF RESULTS OF INTERNATIONAL (15 EXPERTS) AND ITALIAN (17 EXPERTS) CARDIAC COMPETENCIES

COMPETENCY	INTERNATIONAL (Frequency)	ITALY (Frequency)	COMMENTS
ECG Skills (Recognizing significant ECG alterations)	12	14	Double counted one here as part of physical examination
Health promotion (Educate, inform, communicate with patients and their family or caregiver)	10	13	
Knowing how to assess and deal with signs and symptoms (Chest pain management + management of heart failure+ managing cardiac surgical patients)	5	12	
Communication skills (Relational-communication skills)	4	12	
Knowing how to use cardiology equipment and specialized knowledge of monitoring systems (hemodynamic monitoring + knowledge of cardiac inserts – stents/pacemakers)	5	11	
Leadership skills (decision making and problem solving)	1	10	
Critical appraisal skills	2	8	
Healthcare process	None	7	
Taking patient history + physical examination (Admitting cardiac patient to ward. Measuring vitals signs, correct use of nursing documentation and assessment scales)	9	7	

Knowledge about cardiac pharmacology + knowledge cardiac interventions + knowledge of anatomy & pathology of hear (Knowledge about heart diseases, cardiac interventions and pharmacology)	11	7	
Organizational skills (managerial and relations linked to manager role)	None	7	
Continuing professional development	1	None	
Advanced education and training	13	None	This includes ALCS, critical care, A&E training
EBP (reflective practice)	1	None	
Oxygen therapy	2		Italian experts listed these which we included under healthcare process
Discharge procedures	1		
Palliative care	2		
Blood sampling	1		
Psychological care	2		

Table 2

ROUND 2 DELPHI – SCORE SHEET WITH THE MERGED LIST OF THE CARDIAC NURSING COMPETENCIES AND MEAN SCORES PROVIDED BY 12 INTERNATIONAL AND 17 ITALIAN EXPERTS ORDERED ACCORDING TO TOTAL MEAN PRIORITY SCORE

COMPETENCIES	MEAN SCORES ITALY	MEAN SCORES INTERNATIONAL	TOTAL MEAN SCORES
Evaluation of signs and symptoms (Chest pain management + management of heart failure+ managing cardiac surgical patients)	**9.7**	**9.6**	**9.65**
Pathophysiology and cardiac pharmacology (Knowledge about heart diseases, cardiac interventions and pharmacology)	**9.3**	**9.0**	**9.15**
ECG Skills (Recognizing significant ECG alterations)	**9.2**	**9.0**	**9.10**
Health promotion (Educate, inform, communicate with patients and their family or caregiver)	**8.9**	**9.3**	**9.10**
Taking patient history + physical examination (Admitting cardiac patient to ward. Measuring vitals signs, correct use of nursing documentation and assessment scales)	**9.2**	**9.0**	**9.10**
Communication skills (Relational-communication skills)	**8.8**	**9.0**	**8.90**
Health care process (Oxygen therapy, Discharge procedures, Palliative care, Blood sampling, Psychological care)	**8.7**	**8.8**	**8.75**
Continuing professional development	**8.8**	**8.2**	**8.50**
Advanced education and training	**9.2**	**7.7**	**8.45**
Know about monitoring system and cardiology equipment (Hemodynamic monitoring + knowledge of cardiac inserts – stents/pacemakers)	**8.9**	**7.9**	**8.40**
Leadership skills (Decision making and problem solving)	**9.0**	**7.7**	**8.35**
Critical appraisal skills	**9.1**	**7.5**	**8.30**
EBP (reflective practice)	**9.1**	**7.3**	**8.20**

Organizational skills (managerial and relations linked to manager role)	**8.2**	**6.5**	**7.35**

Table 3. Results of Round 3 of the e-Delphi study: Core cardiac nursing competencies and total mean scores attributed by 10 international and 17 Italian experts after revealing the rankings provided by other experts in Round 2.

COMPETENCIES	MEAN SCORES INTERNATIONAL	MEAN SCORES ITALY	TOTAL MEAN SCORES
1. Knowing how to assess and deal with signs and symptoms (Chest pain management + management of heart failure+ managing cardiac surgical patients)	9.5	9.8	**9.65**
2. ECG Skills (Recognizing significant ECG alterations)	9.8	9.5	**9.65**
3. Knowledge about cardiac pharmacology, cardiac interventions, anatomy & pathology of the heart	7.9	9.3	**8.65**
4. Health promotion (Educate, inform, communicate with patients and their family or caregiver)	9.8	9.2	**9.50**
5. Taking patient history and physical examination (Admitting cardiac patient to ward. Measuring vitals signs, correct use of nursing documentation and assessment scales)	8.0	9.1	**8.50**
6. Communication skills (Relational-communication skills)	9.3	8.8	**9.05**
7. Health care process (Oxygen therapy, Discharge procedures, Palliative care, Blood sampling, Psychological care)	8.1	8.8	**8.54**
8. Advanced education and training	8.1	9.2	**8.65**
9. Know about monitoring system and cardiology equipment (Hemodynamic monitoring + knowledge of cardiac inserts – stents/pacemakers)	9.2	9.3	**9.25**
10. Leadership skills (Decision making and problem solving)	8.9	9.2	**9.05**
11. Critical appraisal skills	8.6	9.0	**8.80**
12. Continuing professional development	8.8	8.8	**8.80**
13. EBP (reflective practice)	7.3	8.8	**8.05**
14. Organizational skills (managerial and relations linked to manager role)	7.9	8.5	**8.20**