Research priorities for respiratory nursing: a UK-wide Delphi study

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ABSTRACT   Respiratory nurses make a significant contribution to the delivery of respiratory healthcare, but there is a dearth of nurse-led, practice-focused, published research.

Using a modified three-round Delphi, this study sought to identify research priorities for respiratory nursing to inform a national research strategy. Study information and the survey link were sent electronically to members of UK professional respiratory organisations. Round 1 had 78 items across 16 topics, informed by a systematic literature review. Respondents suggested additional items which were content analysed to inform Round 2. Respondents rated all items and ranked the topics in all rounds. To ensure rigour, rounds had an explicit focus with pre-determined criteria for consensus (70%).

In total, 363 responses were received across Rounds 1, 2 and 3 (n=183, 95 and 85, respectively). The top five research priorities were: 1) "Patient understanding of asthma control"; 2) "The clinical and cost-effectiveness of respiratory nurse interventions"; 3) "The impact of nurse-led clinics on patient care"; 4) "Inhaler technique"; and 5) two topics jointly scored: "Prevention of exacerbations" and "Symptom management".

With potential international significance, this is the first UK study to identify research priorities for respiratory nursing, providing direction for those planning or undertaking research.

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UK-wide Delphi survey identifies nursing research priorities to enhance respiratory care for patients and carers http://ow.ly/ekGt30iXYXt

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Introduction

Respiratory disease imposes a considerable impact on patients in terms of mortality and morbidity, and upon their families and carers [1]. Additionally, there is a significant impact on healthcare utilisation and economic cost both nationally and internationally [2, 3]. In Europe, 12% of all deaths are attributed to respiratory disease with over 6 million hospital admissions per annum recorded [3]. In the UK, around 12 million people are diagnosed with lung disease with considerable impact on quality of life, with many patients experiencing a gradual disease progression and subsequent consequences to day-to-day physical functioning, and emotional and psychosocial wellbeing [1, 3].

It is recognised that respiratory nurses, as key members of the respiratory multidisciplinary team, make an important contribution to the care and management of respiratory patients and the delivery of respiratory healthcare services [4, 5]. However, there is limited published evidence regarding the role of respiratory nurses, and a paucity of research into the cost-effectiveness and clinical value of nurse-led care and services [5, 6].

In times of economic austerity there is a global need to focus on models of caring for long-term respiratory patients. In the UK, strategic policy from the Dept of Health sets out a new shared vision for the future of the National Health Service [7]. The focus is on lifestyle choices, chronic conditions and ageing. With an emphasis on integrated models of care, the strategy highlights areas that nurses play a key role in, including public health messages, self-care and service configuration. Many respiratory patients have existing comorbidities and complex needs, yet research regarding both the interventions and the impact of respiratory nursing care is underdeveloped [6]. The current clinical situation often does not facilitate nurses participating in, or undertaking, high-quality research [8]. There is a need not only to develop services but also to measure the impact of interventions to meet the changing needs of an ageing population and the subsequent increasing number of individuals living with long-term respiratory conditions. Respiratory nurses are ideally placed to lead and facilitate high-quality, collaborative, multidisciplinary research that is relevant to people living with a respiratory condition, their lay carers, families, and health and social care provision. With limited resources, however, identifying and outlining relevant research priorities may facilitate a focus on current gaps to progress research in this area.

The American Thoracic Society has previously set out research priorities in respiratory nursing [9, 10]. Key priorities were identified, including health promotion, disease prevention and end-of-life care, which informed the survey of this current study. Additionally, disease-specific research priorities have been identified by nurses such as lung cancer nurse specialists [11], and cystic fibrosis research priorities compiled by the Allied Health and Nursing Professions Working Group [12] and through research collaborations such as EMBARC (European Multicentre Bronchiectasis Audit and Research Collaboration) [13].

Other research priority studies included a published editorial outlining a review of UK respiratory research priorities in 2008 [14], and an e-Delphi survey of 23 experts from 21 countries in order to identify and prioritise the respiratory research needs of primary care conducted by the International Primary Care Respiratory Group [15]. However, these studies had very little or no nursing representation and do not have a nursing focus.

It is apparent that there is potential for respiratory nurses to lead research related to the multidisciplinary care and management of respiratory patients and the provision of respiratory services. However, as there are no current UK national respiratory nurse research priorities, a Delphi survey was undertaken to establish a consensus.

Materials and methods

A three-round modified Delphi technique utilising an online survey (SurveyMonkey; www.surveymonkey.com) was conducted with respiratory nurses from UK professional organisations to identify research priorities for respiratory nursing. The data was collected from July 2016 to November 2016. The Delphi technique was chosen as it is a recognised method for identifying and prioritising views on a variety of topics. The method has been successful in identifying national priorities in health research [16, 17] and has a strong track record in nursing [18, 19]. The methods and sample sizes for the study are illustrated in figure 1. The CREDES (Guidance on Conducting and REporting DElphi Studies) guidelines were utilised to present the study [20].

There is no agreed level of consensus for Delphi studies as it is dependent upon the sample numbers and the aim of the research [21–24]. However, it is vital for rigour and transparency that each study has an agreed upon criterion [24–26]. To ensure rigour, each round of the Delphi in this study had an explicit focus, with the following pre-determined criteria for consensus and any changes made to items between rounds: 1) "criterion to accept an item": at least 70% of the respondents rated an item as "important"
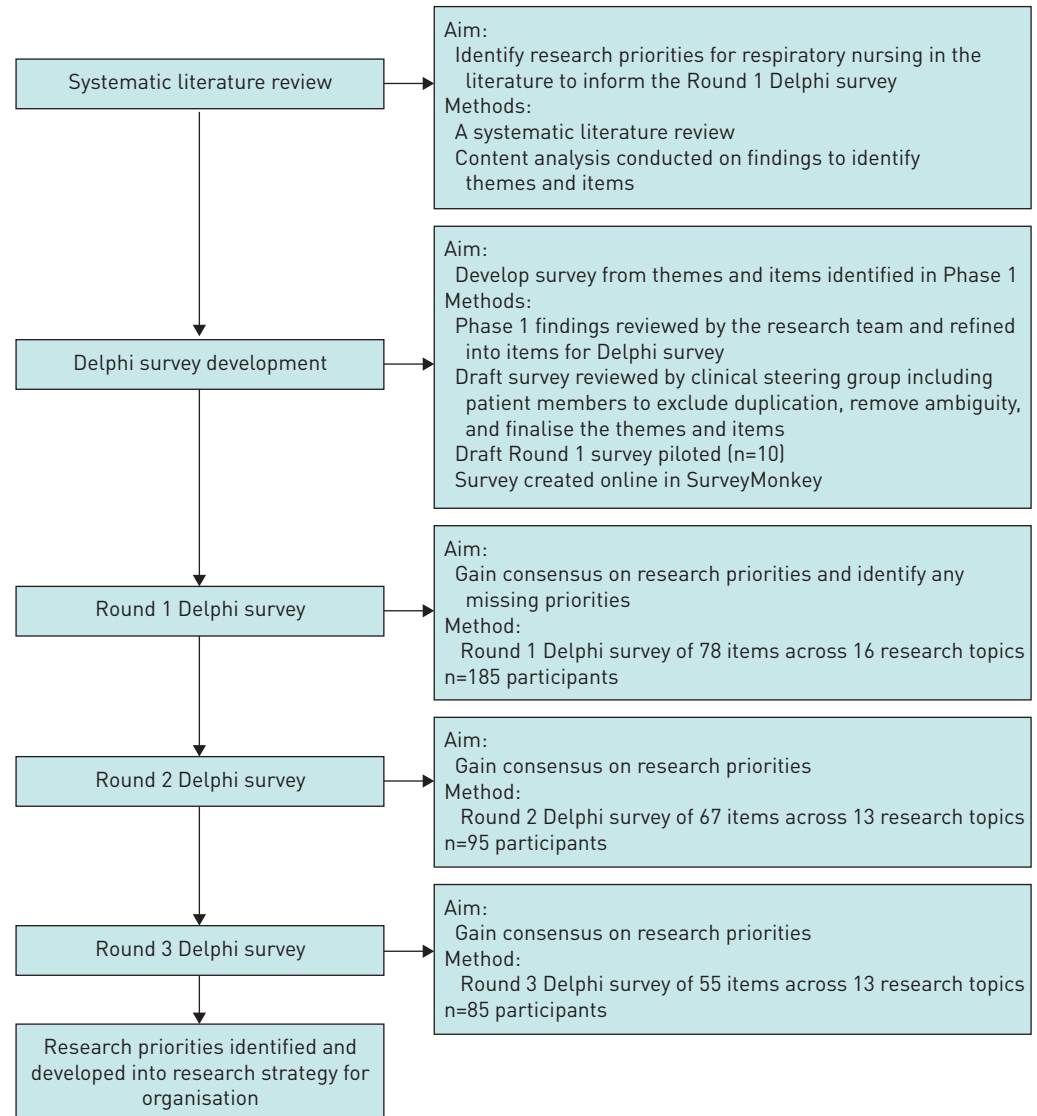
FIGURE 1 Flowchart of multiphase modified Delphi phases.

(score of 4 points) or "extremely important" (score of 5 points); and 2) "criterion for rejecting an item": any items that did not meet the 70% criteria and rating median of ⩾4 points.

Ethical approval for the project was granted by the Faculty Research Ethics Committee, Edge Hill University (FOH116).

Recruitment

The study used a purposive, organisational approach to recruitment, rather than a small expert panel, to facilitate engagement of respiratory nurses from across the UK. The 1100 members of the Association of Respiratory Nurse Specialists (ARNS), along with respiratory nurses of the British Thoracic Society and the Primary Care Respiratory Society UK, were invited to participate in the online survey by e-mail *via* the ARNS secretariat and use of social media.

Development of Round 1 Delphi survey

A systematic literature review was undertaken in April 2016 using key terms to search MEDLINE and CINAHL online databases, conference proceedings, and government and key respiratory organisation websites to identify research recommendations for respiratory nursing. After applying the screening criteria, 65 peer-reviewed papers were included in the review, along with current international guidance

documents and clinical guidelines. Details of the criteria and search are presented in figure 2, adapted from PRISMA [27].

Four overarching themes and subthemes (topics) of research recommendations were identified from the literature and used to inform Round 1 of the Delphi, which were related to specific diseases, care interventions or models of care delivery (table 1).

The draft survey was reviewed and piloted before being finalised for dissemination. The Round 1 Delphi survey had three sections that collected demographics, and asked participants to rate 78 items across 16 topics by "How important do you think it is to include the following items as priorities in the future nursing research strategy?" on a five-point Likert scale (1 being "not at all important" and 5 being "extremely important") and rank the topic areas, indicating which were the top five priority topics.

Analysis

All qualitative data gathered through the open responses, including any new items suggested by respondents in Round 1, were analysed using a content approach by C.A.K., verified by K.K., and then reviewed by the full team and clinical steering group before being added to the Round 2 survey [28]. The quantitative data were entered into SPSS Statistics for Windows version 22 (IBM, Armonk, NY, USA) for analysis. Summary statistics of measures of central tendency (mean, median) and level of dispersion (standard deviation, interquartile range) were computed to determine the spread of responses and the number of items that met the pre-determined criteria for consensus of 70% for each round [23]. A classical Delphi tends to remove items where there is consensus, retaining only those where consensus has not been reached for additional consideration in subsequent rounds. This approach has been modified in

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┌─────────────────────────────────┐   ┌─────────────────────────────────┐
│ 1384 records identified through │   │ 1319 records identified through │
│ MEDLINE screened by titles      │   │ CINAHL screened by titles       │
│ and/or abstracts for relevance  │   │ and/or abstracts for relevance  │
│ to the research question        │   │ to the research question        │
└─────────────────────────────────┘   └─────────────────────────────────┘
                │                                       │
                ▼                                       ▼
┌─────────────────────────────────┐   ┌─────────────────────────────────┐
│ 475 records screened against    │   │ 151 records screened against    │
│ inclusion/exclusion criteria    │   │ inclusion/exclusion criteria    │
└─────────────────────────────────┘   └─────────────────────────────────┘
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Inclusion criteria:
Relevant to respiratory nursing
Topic/area commensurate with the remit and ambition of the RNRC
Topic/area prevalence
Relevant to UK nursing practice and patient population
Adults, paediatrics, adolescents and transitional care
Patient-focused areas of practice
English language

Exclusion criteria:
Intensive and critical care nursing
Drug/pharmaceutical innovations and clinical trials of new therapies
Rare disease areas
Practice related to developing countries
Neonates
Laboratory, cellular or animal focus studies
Papers unavailable in English language

82 articles assessed for eligibility following removal of duplicates
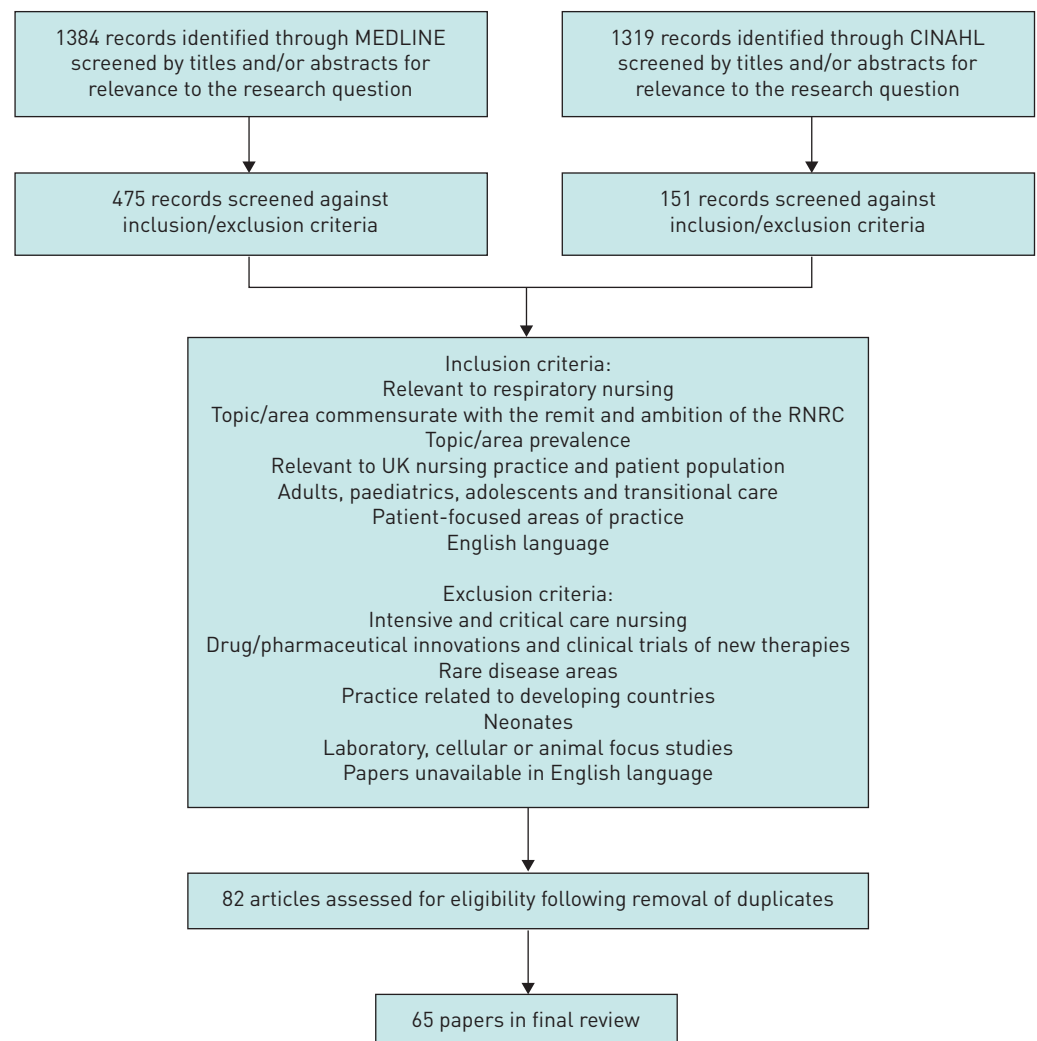
65 papers in final review

FIGURE 2 Flowchart of literature search. RNRC: Respiratory Nurse Research Consortium.

TABLE 1 Themes and subthemes (topics) identified from the literature review

Theme	Subthemes (topics)
Theme 1: Prevention of respiratory disease and related disability	Smoking behaviour Exercise for respiratory health Prevention and early intervention
Theme 2: Disease management	Self-management Pulmonary rehabilitation Cognitive behavioural therapy Disease-specific topics for chronic obstructive pulmonary disease, asthma, bronchiectasis, cystic fibrosis, interstitial lung disease, lung cancer and obstructive sleep apnoea syndrome
Theme 3: Organisation and delivery of care	Care pathways Clinical and cost-effectiveness of respiratory nurse intervention Role effectiveness (*e.g.* cost and quality outcomes for respiratory nursing care interventions) Nurse prescribing in respiratory care (impact on disease management and cost; acceptability to patients) Impact of nursing assessment, examination and intervention Nurse-led clinics (advantages, disadvantages, outcomes) Telehealth and telemedicine Economics of care delivery Primary care models of respiratory care Expert patient/patient support groups Education and training of nurses in respiratory care Infection control Models of care Outcome measures Adherence to guidelines
Theme 4: Palliative care	Decision making Style/format of communication Recognising the palliative care phase Care for carers Impact on carers Skills/training Symptom management Models of end-of-life/palliative care delivery Complimentary therapies

studies that have sought to refine and reduce the number of items to identify items or priorities [24–26]. In this modified Delphi where there was clear disagreement about the importance of an item according to the pre-set criteria, the item was removed. Items that met the consensus criteria were retained for another round of rating to provide further refinement of the ranking of priorities perceived as important for nurse-led respiratory research. Feedback of the group response for items from the previous round was provided in each new round. Mean scores were calculated for the final Round 3 and used to rank the remaining 55 items, across all items and within the remaining 13 topics.

Results

Participants

It is unknown how many individuals received and opened the e-mail invitation to participate for Round 1, so the full membership of ARNS was used to calculate an approximate response rate for Rounds 1, 2 and 3 at 17%, 9% and 8%, respectively. Delphi studies often report response rates lowering as rounds increase with organisational studies, reporting 6–8% average response rates [29]. The demographic spread of respondents was representative of the ARNS membership composition: respondents were from all areas of the UK; the majority were Respiratory Nurse Specialists, had worked in respiratory nursing for 11–20 years and worked in adult services (table 2).

Delphi rounds

The changes to the topics and items between rounds after the consensus criteria were applied are shown in table 3. Three topics and 26 items were removed, leaving 55 items across 13 topics in the final list of research priorities.

TABLE 2 Demographic information of respondents across the rounds			
Demographics	Round 1	Round 2	Round 3
Subjects	183	95	85
Current role/job title			
Advanced Nurse Practitioner	11 (6)	9 (10)	6 (7)
Asthma Nurse	4 (2)	1 (1)	1 (1)
Consultant Nurse	9 (5)	4 (4)	5 (6)
Paediatric Nurse	3 (2)	0	0
Practice Nurse	20 (11)	10 (11)	10 (12)
Research Nurse	8 (4)	5 (5)	5 (6)
Respiratory Nurse	15 (8)	11 (12)	8 (10)
Respiratory Nurse Specialist	82 (45)	34 (36)	29 (36)
Team Lead Manager	17 (9)	6 (6)	2 (3)
Other	4 (2)	7 (7)	15 (19)
No response	10 (5)	8 (8)	4 (5)
Length of time working in a respiratory specialism years			
<5	17 (9)	12 (13)	9 (11)
5–10	44 (24)	22 (23)	24 (30)
11–20	82 (45)	34 (36)	28 (35)
>20	30 (16)	19 (20)	20 (25)
No response	10 (6)	8 (8)	4 (5)
Type of service currently working in			
Primary care	48 (26)	34 (36)	27 (32)
Community care	37 (20)	20 (21)	20 (24)
Secondary care	77 (42)	37 (37)	34 (40)
Tertiary care	7 (4)	4 (4)	5 (6)
Intermediate care	5 (3)	4 (4)	4 (5)
Other	20 (11)	6 (6)	7 (8)
Type of patient group primarily working with			
Paediatrics	4 (2)	1 (1)	3 (4)
Adults	137 (75)	70 (74)	59 (73)
Both paediatrics and adults	32 (18)	16 (17)	19 (24)
No response	10 (5)	8 (8)	4 (5)
Data are presented as n or n (%).			

Consensus results

The key research priorities identified by respondents after three rounds of the Delphi were identified. Given the breadth of work undertaken in the respiratory nursing specialism, it is not surprising that different research priorities were rated as relevant for different nurses and services, creating a spread across the themes. Table 4 reports the research priorities ranked by mean score. All items remaining achieved a high level of consensus.

Theme 2 ("Disease management") was the dominant theme, with a number of practice areas identified as priorities for future research, including some disease-specific areas, inhaler technique, and psychological management of anxiety and depression. Theme 3 ("Organisation and delivery of care") had the second most priorities, with priorities around establishing an evidence base of the impact of respiratory nursing and the quality and impact of training. Smoking behaviours of children and adults was the highest ranked item for Theme 1 ("Prevention of respiratory disease and related disability"), and an integrated approach to palliative care delivery for Theme 4 ("Palliative care").

Discussion

This article presents findings from the first UK-wide Delphi study to identify research priorities for respiratory nursing. e-Delphis conducted using online software have become very popular with the advancement of the internet [30]. The findings provide a basis for a UK respiratory nurse research strategy, direction for the European perspective and an update to the previously identified US respiratory nurse research priorities [9, 10].

The literature review identified a diverse range of research recommendations related to respiratory nursing that were organised into four main themes. The key research priorities, identified by means of consensus, reflect topical issues in respiratory care that are deemed important to respiratory nursing.

TABLE 3 Distribution and changes to survey items and topics between rounds

Topic		Round 1 n	Change to Round 2	Round 2 n	Change to Round 3	Round 3 n
1	Approaches to the prevention of respiratory disease	6	+1	7	−3	4
2	Self-management of chronic respiratory disease	7	+1	8	−1	7
3	Pulmonary rehabilitation	8	−3	5	−2	3
4	Psychological interventions	3	0	3	0	3
5	Management of long-term respiratory conditions	10	−4	6	0	6
6	Family and unpaid carers	3	−1	2	0	2
7	Management of chronic obstructive pulmonary disease	4	0	4	−1	3
8	Management of asthma	6	−1	5	−1	4
9	Management of bronchiectasis	3	0	3	−2	1
10	Management of cystic fibrosis#	3	−3	0	0	0
11	Management of interstitial lung disease	2	+2	4	0	4
12	Management of obstructive sleep apnoea syndrome#	2	−2	0	0	0
13	Organisation and delivery of care	9	−1	8	−1	7
14	Education and training of nurses	4	+3	7	−1	6
15	Telehealth and telemedicine#	4	−4	0	0	0
16	Palliative care	4	+1	5	0	5
Total		78	−11	67	−12	55

#: Topics 10, 12 and 15 were removed based on analysis of Round 1 data, leaving 13 topics for Rounds 2 and 3.

TABLE 4 Key research priorities ranked by mean score

Rank	Research priorities	Theme (topic)#	Consensus %	Mean score
1	Patient understanding of asthma control[¶]	2 (8)	91	4.47
2	The clinical and cost-effectiveness of respiratory nurse interventions[¶]	3 (13)	90	4.45
3	The impact of nurse-led clinics on patient care	3 (13)	92	4.41
4	Inhaler technique[¶]	2 (2)	83	4.40
5=	Prevention of exacerbations[¶]	2 (5)	92	4.39
5=	Symptom management[¶]	2 (5)	92	4.39
6	Integrated approaches to delivery of care by respiratory nurses with palliative care services[¶]	4 (16)	87	4.35
7	Self-management and education related to bronchiectasis[¶]	2 (9)	86	4.35
8	Smoking behaviours in teenagers and children and adults[¶]	1 (1)	81	4.31
9	The impact of training on the quality of spirometry[¶]	3 (14)	88	4.32
10	The psychological management of anxiety and depression[¶]	2 (4)	88	4.28

#: Theme 1: Prevention of respiratory disease and related disability; Theme 2: Disease management; Theme 3: Organisation and delivery of care; Theme 4: Palliative care; see table 3 for topic numbering; [¶]: top ranked within own topic.

Theme 1: Prevention of respiratory disease and related disability
The top priority regarding smoking behaviours, particularly the use of e-cigarettes, reflects current interest in smoking cessation strategies. The evolution of e-cigarettes and the concern, particularly in children and adolescents, regarding uptake and the consequential nicotine addiction that may lead to future cigarette smoking is a topical issue [31]. The safety of e-cigarettes has not yet been definitively upheld and this remains a contentious area in the respiratory community [32]. It is possible that this current debate, and the ongoing acknowledgement that prevention of respiratory disease will primarily be achieved through reduction of smoking in the general population, has led to this definitive priority for research. Respiratory

nurses could play a vital role in leading such research owing to their contact with these patient groups and nonspecialist healthcare professionals.

Theme 2: Disease management

Several practice areas were identified as future research priorities, including some disease-specific areas (*e.g.* patient understanding of asthma and self-management related to bronchiectasis). Most of these aspects of disease management would be regarded as essential to a respiratory nurse's practice and all relate to the patient education role that is often associated with, and performed, by respiratory nurses [5].

These priorities therefore reflect topical issues in the respiratory community that nurses can lead on and take forward as collaborative research projects. For example, asthma management features in the Asthma UK research strategy, which highlights that people need to understand, appreciate the benefits and comply with treatments [33]. Both psychological and lifestyle factors are highlighted in this strategy, emphasising the need to invest in research that enables and empowers people to take control of their condition so that they can live full and active lives. Additionally, the need for new studies to determine the effectiveness of self-management in bronchiectasis was prioritised by the EMBARC multistakeholder working group, a European Respiratory Society (ERS) Clinical Research Collaborative [13]. Clearly, nurses will play a central role in developing and researching such interventions.

Theme 3: Organisation and delivery of care

The priorities under "Organisation and delivery of care" are primarily concerned with establishing an evidence base of the impact of respiratory nursing on patient outcomes and experience, and the quality and benefits of specialist training for nurses; this is an area that has been underresearched to date. The literature appraising the effectiveness of the Respiratory Nurse Specialist is scant and systematic reviews are inconclusive [34]. Although there have been some trials of reasonable quality conducted demonstrating the efficacy of nurse-led care, these trials have been medically led, outcome measures were probably not sensitive to nursing input and the economic impact was not favourable to nursing [35]. The lack of research in this area has therefore potentially impacted on recent trends such as the dilution of specialist aspects of roles and, in some cases, downgrading experienced by respiratory nurses. Work has begun to examine the impact that respiratory nurses have on patient health outcomes and experiences, and the development of Respiratory Nurse Sensitive Outcome Indicators will be an important step towards evaluating fully the impact of respiratory nursing [36].

Evidence suggests that the quality of spirometry, particularly in primary care, is often substandard and that training is valuable in improving quality [37]; therefore, the need for a standardised approach towards education and training has already been identified [38]. The introduction of the ERS Spirometry Driving Licence has made some progress to setting an international standard for spirometry, and it will be incumbent on respiratory nurses and respiratory training organisations to ensure that the programme is rolled out and fully evaluated [3].

Theme 4: Palliative care

The issue of palliative care for respiratory patients and their carers has previously been neglected [39], but a focus on end-of-life care for respiratory patients has now highlighted palliative care needs [39, 40]. Respiratory nurses not only deliver but also often lead on palliative care services for respiratory patients [3], but despite end-of-life decision making being highlighted as a research priority for nurses in 1998 [9], there remains a dearth of evidence in relation to this area. Nurses can, and should, play an important role in taking forward this important programme of research.

Strengths and limitations

This study has several strengths due to its robust methodological approach, including the formulation of topics and items from the research recommendations in the literature, use of a clinical advisory group for discussion and development of the survey, the opportunity for respondents to nominate additional topics and items, and following of pre-determined criteria for inclusion and exclusion of items throughout the rounds. A broad recruitment approach allowed the survey to be as inclusive as possible and consistent responses throughout the later rounds demonstrated engagement from the targeted population. The demographics indicated a good spread across primary and secondary care, representing an experienced pool of nurses throughout the UK; it will be interesting to gain a European perspective in the future.

Limitations include the imprecise estimation of the response rate due to the organisational approach and unknown percentage of e-mails received and opened, rather than sent. The low numbers of paediatric nurses contributing to the survey was disappointing, although this was somewhat offset by those who indicated that they dealt with both paediatric and adult patients. It is worth noting that despite the

importance within the survey, as evidenced by the large volume of comments made by respondents, Topics 3 ("Pulmonary rehabilitation"), 4 ("Psychological interventions") and 6 ("Family and unpaid carers") were not included in the top 10 ranked research priorities across all items in the survey. The contemporary nature of issues concerning organisation and delivery of care, particularly in relation to investment and value of the workforce, may have guided respondents to rank these delivery models above clinical issues. This may mirror some of the professional challenges facing nurse specialists today, *e.g.* defining the role/remit and cost-effectiveness of services. The survey identified respiratory nurse research priorities; further research with patients and carers could strengthen the empirical evidence for research priorities in respiratory nursing.

Conclusions

This Delphi study has successfully identified the key research priorities for respiratory nursing, by respiratory nurses, for the first time in the UK setting. The findings will serve to inform the ARNS research strategy, and will provide direction and priority for those wishing to undertake respiratory research. It will provide a focus for the support needed and produce opportunities for new collaborative research partnerships. Having a clear strategic direction, along with the appropriate support, research training and mentoring, is important for the future of the specialism; ultimately for empowering and providing opportunities for nurses to lead research that will enhance the respiratory care delivered to patients, their families and carers in the future.

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