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How do nurses and midwives perceive their preparedness for quality improvement and patient safety in practice? A cross-sectional national study in Ireland

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ABSTRACT

Background: Although patient safety and quality are cornerstones of healthcare practice, evidence is limited of the knowledge, skills and competence of practicing nurses and midwives in Ireland.
Objectives: To investigate the perceptions of nurses and midwives regarding their continuing professional development-based preparedness for, and participation in quality and safety in the clinical setting.
Design: A cross-sectional survey was undertaken across the Republic of Ireland in 2016 examining nurses and midwives' perceptions of their knowledge and skills in quality and safety methods and tools, their views of competence in this field using the domains from the Quality and Safety Education for Nurses (QSEN) framework (person-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics), and their participation in practice related to their access to quality and safety data.
Settings: 12 Health Service Executive (HSE) Centers of Nursing and Midwifery Education (CNMEs) in Ireland
Participants: Practicing nurses and midwives (n = 654) working in acute hospitals and community healthcare organizations who were undertaking continuing professional development (CPD) education at the time of data collection (March–April 2016).
Methods: Survey methodology. 1787 surveys were distributed. Data were analyzed by IBM Statistical Package for the Social Sciences.
Results: A response rate of 37% (n = 654/1787) was achieved. While respondents were highly trained academically, many reported a lack of confidence in quality and safety methods and tools and QSEN competencies. Frontline staff nurses and midwives reported they were less prepared than their mid and senior level colleagues. Significant numbers indicated they were not engaged in quality and safety in practice.
Conclusions: This first nationwide study in Ireland has discovered that nurses and midwives perceive gaps in their preparedness to engage in quality improvement and patient safety in practice. To safeguard patient care, priority should be given to ensuring front-line staff are appropriately educated, have access to data, and time to competently participate in the continuous improvement of patient care.

1. Introduction

Patient safety and the quality of care are global imperatives at the forefront of policy agendas in health and social care. The factors that influence safe care delivery are complex and multi-dimensional. Healthcare staff go to work each day with the intention to do the best they can. However human error is inevitable, where care processes can be unreliable, and organizations lack consistency in supporting staff to deliver safe care. In Ireland, findings from recent investigations into care and governance failures have highlighted the importance of a "safety first" culture in healthcare, and the crucial requirement for education and training for nurses, midwives and other healthcare professionals to improve the quality and safety of patient care (Health Information and Quality Authority, 2013, 2015; Health Service

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Executive, 2010a, 2010b, 2010c, 2013, 2016).

The delivery of care to patients ('work as done') can be influenced and compromised within clinical care settings and may result in variation from formal policies, procedures and guidelines ('work as imagined') (Vincent and Amalberti, 2016). An increasing debate on the safety of patient care relates to the educational preparedness of healthcare professionals in quality and safety (Boaden et al., 2008; Health Foundation, 2012; deSilva, 2015; Ranjbar and Emami Zeydi, 2016; Vincent and Amalberti, 2016; Lukewich et al., 2015; Usher et al., 2015; VanDenKerkhof et al., 2017). A particular focus of this debate is whether healthcare professionals possess the knowledge, skills, competence and motivation required to safeguard and improve patient care (Health Foundation, 2012; Vincent and Amalberti, 2016). A lack of knowledge and skills among clinicians and managers has been identified as a significant barrier to improving the quality of care (Devitt and Murphy, 2004; Neale et al., 2007; Ham, 2009; Ham et al., 2016); and more recent evidence suggests that healthcare personnel may not be sufficiently skilled, or they may not have received the necessary training in quality improvement and patient safety (Vincent and Amalberti, 2016). Concerns have also been expressed in the literature regarding the quality and safety competence of nursing and other clinical professional graduates, suggesting they are not adequately prepared to safely enter the clinical setting as the higher education sector and the accrediting bodies have not kept up with workforce requirements (Steven et al., 2013; Tregunno et al., 2014). Evidence also suggests that current healthcare practitioners and managers lack basic skills in assessing evidence, measuring care, planning improvements, managing change projects and analyzing data (Ham et al., 2016).

Ireland is acknowledged as having a highly trained professional healthcare workforce (Behan et al., 2009). However as with many other countries across the globe, Ireland is facing challenges relating to unsafe practices such as poor hand hygiene and medication errors, noncompliance with care standards, and mistakes in diagnosis and treatments (Health Information and Quality Authority, 2013, 2015; Health Service Executive, 2010a, 2010b, 2010c, 2013, 2016; Campbell, 2008; Department of Health and Children, 2008; Health Information and Quality Authority, 2012). The contribution of nurses and midwives to provide quality care and patient safety is frequently cited in the literature (Aiken et al., 2011, 2012, 2014, 2017; Scott et al., 2013), and their professional development in quality improvement and safety is advocated as the bridge to safer care (Sherwood and Barnsteiner, 2012). Quality care is considered a key principle for conduct in the Nursing and Midwifery Board of Ireland Code of Professional Conduct and Ethics for Registered Nurses and Midwives, and therefore it is important for these healthcare professionals to follow the professional guidelines, and understand and apply the requirements for safe and quality care in practice.

Quality improvement and safety education has an important role to play to achieve safe patient care (Dixon-Woods et al., 2014; Illingworth, 2015). Globally, compared to other high-risk industries such as aviation, the healthcare sector has been relatively slow to embrace and embed knowledge and competence in the theory and practice of safety science and this may account for why quality and safety initiatives and the key principles are often misunderstood (Batalden and Davidoff, 2007; Walshe, 2009; Taylor et al., 2013; Staines et al., 2015). Although the World Health Organisation (2011) developed a Patient Safety Curriculum Guide, evidence is limited on the adoption of this guide by healthcare professional educators (Health Foundation, 2012), and of its visibility in the continuing professional development of nurses and midwives (Steven et al., 2013; Kovner et al., 2010; Tella, 2014). Empirical evidence on the quality and safety preparation given to nurses and midwives is limited (Kovner et al., 2010; Tella, 2014). In Ireland, while a few studies offer useful data concerning nurses and midwives (Scott et al., 2013; Kirwan et al., 2013), a gap remains in the literature when it comes to the profile of nurses and midwives (Scott et al., 2013), and in particular their own perceptions of competence related to their quality improvement and safety knowledge in the practice setting and their own professional development.

This study therefore aims to examine the perceptions of practicing nurses and midwives in the Health Service Executive (HSE), the provider of public health services in Ireland, with regard to their preparedness for, and participation in quality improvement and patient safety. The study explores preparedness in policy, regulation and practice-related quality and safety best practice guidance, implementation methods and tools, and in the competency-related variables of the QSEN (Quality and Safety Education for Nurses) framework. Participation is conceptualized as nurses' and midwives' perceptions of their involvement and opportunities to engage in quality and safety practice, and on their access to quality and patient safety data.

2. Data and methods

Given the focus of this study, a cross-sectional survey design was employed, and the data were collected, collated and analyzed between March 2016 and February 2017.

2.1. Survey questionnaire

A validated survey questionnaire from research conducted in the United States by Kovner et al. (2010), exploring new nurses' perceptions of quality improvement education and their engagement in quality and safety in their clinical practice environments was used (Kovner et al., 2010). This survey tool was chosen as the research variables identified by Kovner et al. (2010) reflected the research objective of this study. The survey examined nurses' knowledge and skills in quality and safety methods and tools, and in the QSEN competency domains. The authors of the survey tool were contacted, and permission was granted to adapt it to the Irish context in order to reflect nursing terminology used in Ireland such as roles, titles, organizations and preparedness variables. An expert panel was convened to establish face validity of the questionnaire and to enable pilot testing to ensure reliability. A total of 35 nurses and midwives were recruited and participated in the pilot, and provided feedback regarding the reliability, appropriateness and acceptability of the adapted survey. Respondent feedback was entered into SPSS version 23 and confirmation of reliability was achieved via a Cronbach Alpha coefficient result of 0.9. Only minor changes to wording were recommended and the survey tool was re-issued to the expert panel. No further changes were recommended by the expert panel. The final version of the modified questionnaire resulted in a 30-item survey. Seven questions captured demographic information, nine questions related to quality and safety preparedness, eleven questions related to participation, two questions related to enablers/barriers and one question facilitated participants to add any additional comments.

2.2. Study setting

Practicing nurses and midwives were accessed through the 12 HSE Centers for Nursing and Midwifery Education (CNMEs) across Ireland. The HSE CNMEs provide nurses and midwives with continuing professional development (CPD) education. The field of work of the study participants was classified as either acute hospital care (includes midwifery) (AHC), or within a community healthcare organization (CHO). Nurses employed in CHOs provide patient care in areas such as community hospitals for older people, intellectual disability services, mental health services, and public health and community nursing services.

2.3. Sampling technique

The sampling frame was based on the average annual footfall of nurses and midwives in attendance in the 12 HSE CNMEs, and equated

to a total population of 18,000. Probability sampling was employed which involved selecting participants who were collectively representative of the population and large enough to establish representativeness. The total cohorts of practicing nurses and midwives employed in HSE acute hospitals and CHO settings, and in attendance in the CNME's over a designated time period of 4 weeks were invited to participate in the study and this was the inclusion criteria. Exclusion criteria related to any nurse or midwife employed outside of the HSE to include the voluntary settings. A power analysis was conducted prior to the commencement of the study to ensure statistical significance of the sample and the likelihood of the effect on the full population. With a 95% confidence level, and a confidence interval of 5%, a sample size of 376 was required to ensure statistical significance.

2.4. Data collection

Ethical approval was gained from the research institute associated with the University College Dublin and the HSE. Data were collated between March and April 2016. In order to ensure a systematic collection of the nationwide questionnaires, directors of nursing and midwifery in the 12 CNME locations were informed of the research study taking place and that their staff would be invited to participate. The 12 directors of CNME provided their commitment to disseminate and collect the surveys from the practicing nurses and midwives while they were in attendance in the educational centers.

2.5. Analysis

The IBM Statistical Package for Social Sciences (SPSS) Version 23 was used to process and analyze the data. The environmental variable of field of work, and the professional profile variables of years in practice and grade were examined. Years in practice were defined in three categories: – 1 to 10 years, 10–20 years, and 20 + years; and grade was defined in three categories – frontline, mid-level and senior level.

As the impact of missing data is a serious consideration that can lead to biased estimations, misleading results and weakened generalizability of the findings (Dong and Peng, 2013), for this study Missing Completely at Random test was undertaken on the full dataset. Calculation of the 74 variables for each case found random distribution of missing data ($\chi^2 = 21.639$, df = 21,007, $p < 0.001$). Three bands were created to explore the degree of missing data: 10% signified 7–8 missing variables; 20% signified 14–15 missing variables, and 30% signified 20–22 missing variables. A dataset based on a 20% missing data value was adopted.

3. Results

3.1. Demographic profile of respondents

A total of 1787 surveys were distributed, and a response rate of 42% ($n = 744$) was achieved. The elimination of missing data resulted in a final dataset of 654 participants, which equated to a response rate of 37%, further reducing the margin of error and giving greater certainty of the accuracy of the calculations. Ninety-two percent of the sample was female (602) which is reflective of the gender balance in nursing and midwifery in Ireland. The largest group of respondents ($n = 232$, 35.5%) were aged between 41 and 50 years indicating a high response from an early middle age workforce. Almost half of the respondents (49%) had 20 + years of practice experience and this pattern of response was consistent across the HSE CNME locations. Respondents' field of work indicated that just less than half ($n = 304$, 47%) were from AHC, with the slightly larger response ($n = 350$, 53%) from CHO's.

Table 1 below outlines the grade distribution which demonstrates the largest group of respondents was front-line staff-nurses and midwives and this finding was noted across the 12 HSE CNME locations.

Table 1
Nursing and midwifery: grade distribution.

Front-line Staff nurses and midwives	Mid-level CNM/CMM 1, 2, 3, and CNS/CMS	Senior level ANP/AMP, ADON/M, DON/M, other	Total
344 (52.5%)	195 (29.9%)	115 (17.6%)	654

Abbreviations: CNM/CMM = Clinical nurse/Midwife manager; CN/MS = Clinical nurse/Midwife specialist; ANP/AMP = Advanced nurse/midwife practitioner; ADON/M = Assistant director of nursing/midwifery; DON/DOM = Director of nursing/midwifery; Other = Respondents currently not working in the above clinical roles, but aligned to these pay scales (CNMEs/NMPDs/Education).

3.2. Preparedness in quality and safety

Over three quarters of respondents (77%) identified themselves as being either “reasonably well” or “very well” prepared through CPD education in quality and safety methods and tools. Further exploration of this theme sought to elicit more detailed information of their perception of their preparedness, specifically related to seven quality improvement and safety methods and tools frequently cited in the literature (Fig. 1) (Health Foundation, 2012); PDSA cycles (Plan, Do, Study, Act); Six Sigma (Define, Measure, Analyze, Improve, Control); Root Cause Analysis; Key Performance Indicators/Metrics; Data Measurement, Monitoring and Analysis; Run Charts and Safety Cross; and Organizational Reporting Systems for error, near miss or adverse event reporting (e.g. National Incident Management System).

In contrast to the earlier positive responses about preparedness in the methods and tools for quality and safety, when asked more specifically, the findings revealed in five of the seven areas, greater numbers of respondents indicated they perceived themselves to be unprepared, as opposed to prepared in patient safety and quality improvement in practice.

Regarding the six QSEN competency domains (patient-centered care, teamwork and collaboration, quality improvement, evidence-based practice, safety and informatics), as Fig. 2 suggests, quality improvement (67.1%) and informatics (42.6%) received the lowest rating in relation to perceived preparedness. Respondents also scored these two QSEN competency domains highly in the field of “neither unprepared nor prepared” at 23% and 35% respectively, indicating they were unsure of their preparedness in these areas. Across the entire suite of QSEN competency areas, > 50% of respondents outlined their perception was that they had not received any CPD in these areas in the previous two years.

3.3. Preparedness and field of work

Nurses and midwives in AHC settings identified higher levels of perceived preparedness in the quality improvement and safety methods and tools of PDSA and key performance indicators/metrics whereas respondents from CHO settings indicated higher levels of perceived preparedness in the QSEN competency domain of person-centered care (Table 2).

3.4. Preparedness and years of practice

Cross-tabulation of preparedness and years in practice demonstrated statistical significance in a range of quality and safety methods and tools and in the QSEN competency domains, as shown in Table 2. Prior to analysis of the research data, it was anticipated that as nurses' and midwives' years of practice experience increased, their perceptions of preparedness would also increase. This form of upward trend was noted in relation to PDSA, Root Cause Analysis and Key Performance Indicators/Metrics. For the QSEN competency-related variables of Quality Improvement and Informatics, the pattern of response revealed a

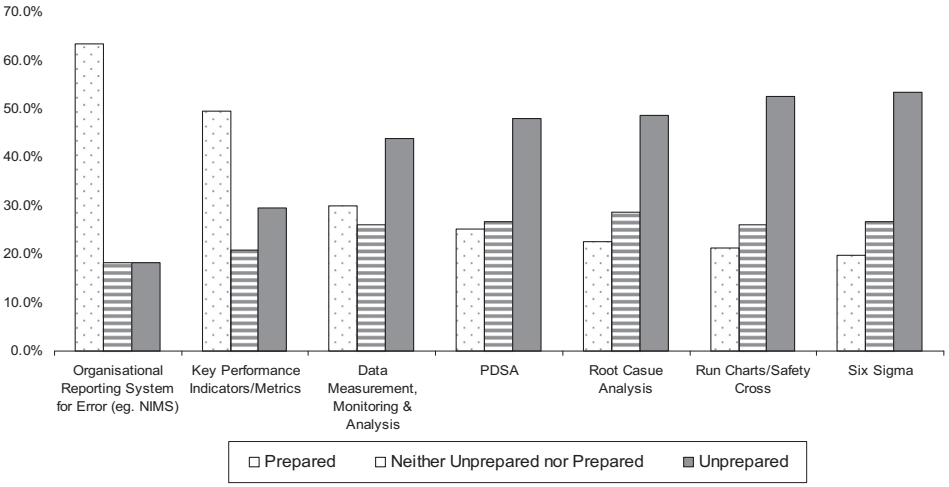

Fig. 1. Percentage frequency responses to quality improvement and safety methods & tools.

decreasing level of perceived preparedness from 20 + years which would suggest nurses' and midwives with greater years of practice experience were less confident in these areas.

3.5. Preparedness and grade

Cross-tabulation of perceptions of quality and safety preparedness and grade identified frontline staff nurses and midwives as the professional grade whose perception of preparedness capability was lower than both their mid-level and senior-level colleagues. This finding was noted in both AHC and CHO settings. This indicates that the largest proportion of the workforce, frontline staff nurses and midwives in both fields of work perceive they have a lower level of preparedness in the quality and safety methods and tools of PDSA, root-cause analysis and KPIs/metrics, and in the competency-based QSEN domains of person-centered care, teamwork and collaboration, evidence-based practice and quality improvement.

3.6. Participation in quality and safety

Participation in quality and safety practice was measured from the perspective of respondent's perception of their involvement in quality and safety within their organizational work area, and their access to data on errors, near misses and adverse events, and to data on healthcare associated infections specific to their practice area.

Two thirds of the total sample (n = 409) indicated they were not currently involved in any quality improvement or safety initiative. In relation to access to data to enable them to participate in safety improvement within their clinical practice areas, 51% indicated they had never received information on errors, near misses or adverse events; and 42% indicated they had never received information on healthcare associated infections. Respondents were also asked regarding their awareness of a reporting system for errors, near misses and adverse events and 42% confirmed they were unaware or did not know if such a reporting system existed.

Cross tabulation of participation, grade and field of work revealed

Table 2
χ^2 tests for preparedness variables.

Preparedness variables	Title	Pearson's chi-squared value	df	p-value
Field of work				
Quality & safety methods & tools	PDSA	15.980	4	.003
	Key performance indicators/metrics	22.427	4	.000
QSEN	Patient/person-centered care	17.421	1	.000
Years in practice				
Quality and safety methods and tools	PDSA	21.064	8	007
	Root cause analysis	18.241	8	.019
	KPIs/metrics	21.524	8	.006
QSEN	Quality improvement	27.737	8	001
	Informatics	18.946	8	.015
Grade				
Quality and safety methods and tools	PDSA	27.783	8	.001
	Root cause analysis	28.493	8	.000
	KPIs/metrics	54.715	8	.000
QSEN	Person-centered care	21.968	8	.005
	Teamwork and collaboration	19.460	8	.013
	Evidence-based practice	18.280	8	.019
	Quality improvement	19.155	8	.014

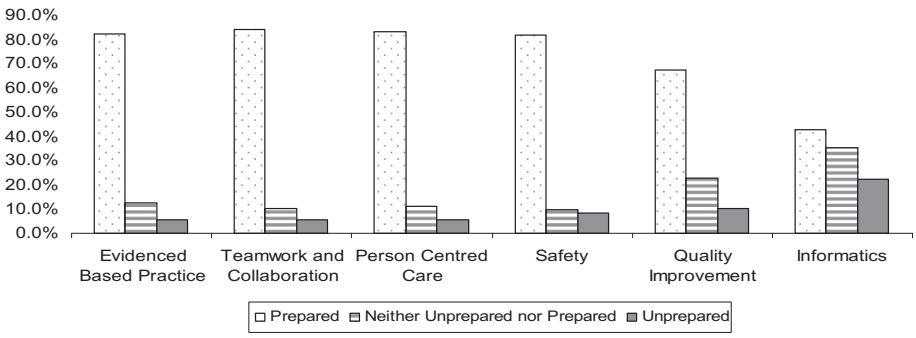

Fig. 2. QSEN competency domains.

front-line staff nurses and midwives in both AHCs and CHOs as the professional grade whose perception of their participation in quality and safety was lower than their mid and senior level colleagues.

4. Discussion

The empirical evidence presented in this study is based on the perceptions of the respondents ($n = 654$) who were practicing nurses and midwives, mainly of a middle age group, highly trained academically, and employed in public sector HSE acute hospitals and CHOs across Ireland.

The findings provide original information on a subject never previously examined in an Irish context. The evidence from the study sheds light on a nursing and midwifery workforce, particularly front-line staff nurses and midwives with perceived preparedness gaps in their quality and safety knowledge, skills and competence; and also, in their participation in this field within their clinical practice environments. The evidence indicated perceived preparedness gaps in the methods and tools to undertake quality and safety improvement, gaps in their CPD-based preparedness in the QSEN competency areas of quality improvement and informatics, and gaps in their participation in quality and safety aligned to access to data, and their active involvement in this field within their clinical practice locations.

In the examination of preparedness, the results are consistent with other studies that suggested healthcare professionals have a knowledge gap relating to quality and safety (Boaden et al., 2008; deSilva, 2015; Ranjbar and Emami Zeydi, 2016; Vincent and Amalberti, 2016; Usher et al., 2015; Devitt and Murphy, 2004; Mansour, 2012; Tregunna et al., 2017; Hussey and Kennedy, 2016; Wong et al., 2010; Wilkinson et al., 2011). The literature suggests that few clinicians in healthcare have a mastery of the theory and practice of improvement science, and few can recognize or utilize process control charts or Plan/Do/Study/Act (PDSA) cycles as systematic tools for the continuous improvement of patient care (Berwick, 2016; Scoville et al., 2016).

Competence-related quality and safety variables were explored in this study using the QSEN framework. Evidence of the success and widespread dissemination of quality and safety competency frameworks is limited (Tella, 2014). However within the United States it would appear QSEN has made some traction to become embedded in undergraduate and post-graduate nursing education (Sherwood and Barnsteiner, 2012; Lyle-Edrosolo and Waxman, 2016). The findings here reveal that nursing and midwifery in Ireland has significant work to do to develop knowledge in the QSEN domains, as the perception of > 50% of respondents indicated they had not received any CPD education in any of these domains in the previous 2 years, which suggests there is room for educational improvement.

Moving to the examination of perceptions of participation, this study demonstrated a significant proportion of respondents who reported they were not currently engaged in quality and safety initiatives, nor were they provided by their organization with the appropriate information or data to enable them to lead and participate in quality and safety practice improvement in the practice setting. These findings highlight an implementation gap between quality and safety policy and the reality of frontline clinical practice. Recently in Ireland, the HSE commenced a national initiative to make quality and safety data more accessible to nurses and midwives, entitled Quality Care-Metrics (Gallen, 2015). However, as well as requiring access to data, nurses and midwives need the ability to understand and interpret the data. This can only be achieved through effective leadership and governance, education, time and resources (Needleman, 2015).

In addition, the finding in the study that two thirds of the total sample perceive themselves as not currently involved in any quality improvement or safety initiative raises questions with regard to their interpretation of quality and safety and whether they perceive it as separate to their role in the field of professional nursing. The Nursing and Midwifery Board of Ireland Code of Professional Conduct and Ethics for Registered Nurses and Midwives, outlines Quality of Practice as one of the key principles for conduct (NMBI, 2014). From a corporate HSE perspective, consideration should be given to how a critical mass of nursing and midwifery quality and safety education requirements can be established at the front-line of clinical practice; in the nursing and midwifery roles who work with patients delivering care twenty-four seven, and who will be well positioned to competently influence change for safer patient care in all clinical settings.

5. Conclusions

Although this study has generated important findings regarding the quality and safety preparedness and participation perceptions of nurses and midwives in Ireland, there were some limitations. Firstly, this study only focused on what nurses and midwives described in the survey response as their perceptions of preparedness for, and participation in, quality and safety practice. Future research should consider a qualitative analysis of their perceptions, and also an ethnographic study to observe participation in quality and safety practice in various clinical settings. A more in-depth analysis to explore quality and safety preparedness from the perspective of educational providers at undergraduate, postgraduate and CPD levels would also be valuable. The second limitation relates to nurses and midwives that were not included in this study. Due to access challenges, nurses and midwives employed in the voluntary sector healthcare organizations were not included. Future research should explore their perceptions of quality and safety preparedness and participation to examine the degree of similarity or variance from these analyzed findings.

The findings from this study are of significant value, and provide important baseline evidence never previously available in an Irish context. For those responsible for the development of healthcare quality and safety at both policy and regulatory level, a review from the perspective of effectiveness should be considered in order to improve nurses and midwives' competence and application of recommended quality and safety best practice guidance. The findings suggest that there are gaps in the translation, dissemination and implementation of quality improvement and safety knowledge, skills and competence to the practicing nurses and midwives in the HSE who participated in this study. For healthcare organizations and managers, it is crucial to reconsider the conditions under which quality and safety knowledge, skills and competence of nurses and midwives can be enhanced and translated into practice. Finally, for educationalists, the findings of this research provide rich evidence of the work yet to be done in the field of nursing and midwifery to find new and innovative educational solutions that will support the HSE to build a critical mass of nursing and midwifery quality and safety improvers at the front-line of practice.

Contributors

The corresponding author led the data collection and analysis. All of the named authors participated in data analysis and the writing of the manuscript.

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Competing interests

None declared.

Ethics approval

Ethical approval was given by the University College Dublin's Office of Research Ethics (Humanities: HS-E-15-116-Gallen-Kodate) and the

Health Service Executive, Ireland.

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