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Exploring how key performance indicators influence nursing and midwifery practice: A mixed methods study.

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Table of amendments as per second review

	Reviewer comment	Changes made/clarification provided	Article section
1	Please explain the randomization process used for the selection of what the authors call the 'probability sample' of 77 DoN from the sample of 502.	"This group represented a non-probability sample for the quantitative phase, which ensured equal opportunity of selection and permitted generalisation (Hunt and Lathlean 2015). Seventy-seven of 502 DoN's replied which was a response rate of 15%."	Under Sample
2	The new sentence inserted on P. 7. (line 42-44) is not clear and should be revised for grammar and clarity	"In relation to the findings set out below, respondents were only required to answer those parts of each question that were relevant to them. Therefore, the total number of responses in some cases fell short of the population size of 77. "	Under Phase 1 Findings
3	The reason for differences in denominators (p. 7-8) is not clear- is this due to missing data or non-response? if so, this should be clarified. The addition of a comment about the volume of missing data and how these were managed should be added to the analysis section.	The reason is clarified as per query 2 above. "The response rate for questions in the multiple-choice section varied. If a respondent did not collect data on a particular KPI they did not respond to that question and the response rate was adjusted accordingly."	Under Phase 1 Findings Inserted under Questionnaire Data Analysis
4	Please explain the exclusion criteria referenced (p. p line 44)	"In ROI, community nursing is included within the public health sector, and therefore the term 'public health' was removed from the ROI exclusion criteria."	Under Sample
5	Overall the manuscript would benefit from editing to ensure the correct use of grammar and consistent punctuation. e.g. see p. 8 line 52-55 and 58-59; p 10, line 20; p. 13, line 42; p. 17, lines 15-22. Consistently include n as well as percentages (e.g. P. 13, line 11); use numbers instead of words if the number is greater than ten (e.g. P. 13, line 11).	Amendments made under the sections identified in the column to the right as well as overall editing	Examples of when KPI data were used to improve practice KPIs most valuable for determining the quality of care Aligning KPIs within the practice context Management of KPI data Limitations Closing the loop
6	Avoid anthropomorphisms such as 'organizations in phase 2 reported' -(e.g. p. 16, line 18) the	"interviewees in all organisations"	Collective leadership

	organizations did not report. Rephrase to reflect how the data about organizations were gathered and from whom.		
7	Specify the course of the quote provided on p. 9, lines 5-6, and how respondents provided this specific response.	"[DoN3]" "Within this free text box…"	KPIs most valuable for determining the quality of care
8	Provide a footnote for figure 3 spelling out the acronyms used	Footnote included	Figure 3

Exploring how key performance indicators influence nursing and midwifery practice: A mixed methods study.

Abstract

Aims: To scope the Key Performance Indicators (KPIs) used in nursing and midwifery across the United Kingdom and Republic of Ireland and explore how they influence practice within healthcare organisations.

Design: The study adopted a sequential, exploratory mixed-methods design.

Methods: Phase 1 incorporated a multiple-choice questionnaire completed by 77 Directors of Nursing recruited using voluntary response sampling. Phase 2 utilised semi-structured interviews with 35 nurses and midwives who were working at executive, senior manager and clinical levels. Data collection of both phases was conducted from January 2016 – October 2016.

Findings: Quantitative data revealed over 100 nursing and midwifery specific KPIs. National requirements were a deciding factor in KPI selection, while clinical involvement was mainly through data collection. Respondents stated that they used patient experience KPIs, but only one was assessed as valid. Thematic analysis identified two themes: The Leadership Challenge (including 'voiceless in the national conversation', 'aligning KPIs within the practice context' and 'listening to those who matter'); and Taking Action (including 'establishing ownership and engaging staff', 'checks and balances' and 'closing the loop').

Conclusion: The large volume of KPI measurement taking place makes meaningful evaluation of performance and quality of care difficult, both within and across organisations**.** Nurses and midwives require enhanced knowledge of the nature and purpose of KPIs, as evidence gained from KPI data collection is insufficient to lead to improvements in practice. A practice context that encourages collective leadership, where multiple sources of evidence are gathered and everyone is included in KPI evaluation and subsequent decision-making, is key.

Impact: This study adds to the body of evidence on KPI understanding. It informs the future effective management of indicators that will facilitate the delivery of meaningful care and reduce the cost, time and effort invested in the implementation of KPIs and data management.

Key words: nursing, midwifery, key performance indicators, quality improvement, collective leadership.

Introduction

The universal drive to improve healthcare and the ensuing focus on the measurement of performance have resulted in a proliferation of key performance indicators (KPIs) worldwide (Dubois et al., 2017). KPIs aim to provide a reliable and accurate means to measure, assess and report on outcomes and patient experiences to confirm that services deliver safe and effective patient care (Department of Health (DoH), 2017a). Whilst KPIs are designed to

improve the quality of care, little is known about how the data generated from KPIs influence decisions made throughout healthcare organisations and how they subsequently influence nursing and midwifery practice.

Background

Improving quality and patient safety has historical antecedents, though it is only since the turn of the century that a universal focus on the measurement of performance has become an increasing imperative (Waring et al., 2016). Major service failings, reports of sub-optimal care and increasing public expectation have led to rapid healthcare changes (Francis, 2013; Ham et al., 2016). International healthcare priorities tend to be concentrated on organisational accountability and transparency of performance data to gain insight into the relationship between quality and patient safety (Francis, 2013; Health Information and Quality Authority (HIQA), 2015).

Contemporary literature reveals that numerous Key Performance Indicators (KPIs) are used in the healthcare sector, but with incongruities evident in how quality assurance and accountability are reported across different healthcare sectors (Jones et al., 2017; Koch et al., 2020). One reason suggested for these differences is that healthcare organisations are highly complex, with the provision of care occurring across a wide diversity of services and areas of clinical practice (Ham et al., 2016). This in turn creates many variables that have the potential to impact on care and may lead to challenges in selecting the most appropriate KPIs (National Health Service (NHS) England 2018; Koch et al., 2020). Work has previously been commissioned by governments seeking to assess the scope of KPIs in use in their countries (NHS Quality Improvement Scotland (QIS), 2005; Griffiths et al., 2008). However, no evidence has been found of attempts to clarify the range of KPIs used across the United Kingdom (UK) and Republic of Ireland (ROI), or the various processes involved.

There is little evidence in the empirical literature to demonstrate how the use of KPIs has resulted in improvements in quality of care. Recognising this, there is increasing consensus that a more inclusive discourse relating to the collection of KPI data is required to develop improvement science as a discipline (Marshall et al., 2013; Berwick, 2015). A review of the literature also revealed little evidence on how organisations report and act on their data. This is important when the principal aim of KPI use is to improve practice (DoH, 2008; DoH, 2017a). In addition, despite the prominence placed on KPIs as a means of measuring healthcare performance, the literature reveals that, within nursing and midwifery practice, there is no agreed definition of a KPI (Heslop and Lu, 2014). Essentially, KPIs should offer *"high level snapshots of a business or organisation based on specific predefined measures.*" (Avinash, 2010). In healthcare, an organisation should identify a small set of goals which are agreed to be important in delivering safe, high quality care. Each goal must be clearly defined within a KPI which, when implemented, guides improvement and indicates whether the goal has been attained within a specific time frame. The focus of the KPI should be on driving and evidencing improvement through the metric, which should not overshadow the indicator function (Marr, 2014; Berwick, 2015). Thus, KPIs are not standards, guidelines, benchmarks or audits, although they may be found in each of these.

KPIs pioneered by the Joint Commission on Accreditation of Healthcare and Organisations and the American Nurses Association (ANA, 2019) have been used as tools for national benchmarking to identify and evaluate areas of internal performance that require practice improvement (Aiken et al., 2014; DoH, 2017a). While many healthcare organisations focus on the most commonly reported KPIs, such as the incidence of pressure ulcers, patient falls and medication errors (Griffiths et al., 2008), it is difficult to interpret how other reported KPIs are specific to nursing and midwifery practice - for example, 'length of patient stay' (Dubois et al., 2013). McCance et al. (2020) question if the commonly cited nursing KPIs provide comprehensive constructive information because such indicators do not necessarily measure what matters most to patients, families, carers and nursing teams. Despite nurses making a significant contribution to the delivery of a positive patient experience and outcome, evidence suggests that a greater emphasis is placed on quantifiable measurement rather than qualitative patient experience data (Griffiths et al., 2008; McCance et al., 2020).

Researchers across the world have highlighted that the influence of nursing practice on the quality and safety of patient care has been largely invisible (Egry, 2017; Liberati et al., 2019). Maben (2008) suggests that this 'invisibility' results in the unmeasured aspects of care that nurses deliver being accorded less importance than the measured aspects. Furthermore, Dubois et al. (2013) argue that there is an inability to capture the nursing contribution due to the profession's inexperience in this developing area of performance science. While researchers and policy makers have highlighted the importance of seeking patient feedback to develop indicators that can measure elements of the patient care experience, this is not without its challenges (Francis, 2013; McCance et al., 2015; Marr, 2018). Difficulties have been described both in trying to quantify "soft intelligence" data and in turning it into a form useful for informing practice (Martin et al., 2015, p.19). Furthermore, the subtle but important changes in practice that result from the implementation of quality improvement projects can be difficult to recognise and measure (Abrahamson et al., 2015). Nevertheless, KPI outcomes specific to nurses' contributions to practice are needed to make their unique contribution visible and provide explicit evidence of the difference they make to quality of care (Dubois et al., 2017; McCance et al., 2020).

In response to these challenges, McCance et al. (2020) have demonstrated the value nurses and midwives place on being involved in gathering data that is meaningful to them, using this to evidence the high standard of care they deliver and to implement changes within practice. The use of person-centred KPI data alongside existing quality indicators has the potential to deliver the three key components of high quality care: patient safety, clinical effectiveness and patient-centredness (Health Information and Quality Authority (HIQA), 2013; DoH, 2014; Marr, 2018). However, the literature indicates that currently there is limited knowledge of how KPI data are communicated within organisations and the effect this has on decisions made about nursing and midwifery practice. KPIs and the data that result from their use are simply information; how these data are translated into useable knowledge that produces demonstrable improvement in care is unclear. Furthermore, there is little discussion between nursing at the organisational and clinical levels regarding the strategic management of KPI data and its relationship to performance accountability (Sorensen and Iedema, 2010). This paper reports on the findings of a study investigating factors that influence nursing and midwifery teams in relation to KPIs.

The Study

Aim and objectives

The research seeks to answer the following overarching question:
• How does the use of KPIs influence nursing and midwifery practice?

More specifically the following three objectives were identified:
1. To scope the range of KPIs used in practice.
2. To identify the processes for implementation of KPIs and mechanisms for monitoring and reporting.
3. To explore the influence of KPIs on nursing and midwifery practice in an organisational context, identifying factors to maximise their impact.

Design

This study used a sequential, exploratory mixed methods approach – a preliminary quantitative input to a core qualitative method (Morgan, 2014). Figure 1 provides an overview of the research design that illustrates the sequencing of the methods applied and highlights that data integration occurred once the data from both phases had been analysed. Quantitative questionnaire data were collected from 77 Directors of Nursing (DoNs) across the UK and Ireland between January and April 2016. Qualitative interviews were conducted between July and October 2016. The study's mixed methodology was developed based on the recommendations of the Good Reporting of a Mixed Methods Study (GRAMMS) statement (O'Cathain et al., 2008).

Sample

Directors of Nursing (n=502) were deemed to be the richest source of information based on their knowledge of KPIs in their respective healthcare organisations. This group represented a non-probability sample for the quantitative phase, which ensured equal opportunity of selection and permitted generalisation (Hunt and Lathlean 2015). Seventy-seven of 502 DoNs replied, which was a response rate of 15%. This clearly defined population also reduced sampling error and potential researcher bias in participant selection (Hunt and Lathlean, 2015; Patton, 2015). Exclusion criteria for the UK included ambulance trusts, public health, general practitioner practices and private/voluntary healthcare organisations. In ROI, community nursing is included within the public health sector, and therefore the term 'public health' was removed from the ROI exclusion criteria. Table 1 presents a sample breakdown per country.

Based on phase 1 analysis, it was determined that interviews undertaken with nurses and midwives working at executive, senior manager and clinical levels would be of the most benefit for phase 2. While 39 DoNs volunteered to support phase 2, it was not feasible to conduct interviews in all of their organisations. Purposive selection with the defining of criteria (Morgan, 2014) was chosen as the most appropriate fit for both the initial selection of organisations and then of their participants. Eight organisations were included and 35 volunteers, who were involved in the management of KPIs, were interviewed.

Quantitative data collection

The phase 1 questionnaire was designed using Qualtrics (2015), a secure display and data collection platform, and comprised three sections.
Section one requested demographic information of the organisations such as country, size of population covered, services provided and the number of nurses and midwives employed. Section two sought information on KPI management processes and was adapted from the Performance Measurement Process Model (Artley and Stroh, 2001) which corresponded to processes identified in studies exploring KPI use. Essentially this is a loop process involving: (i) the identification of need and development of KPIs; (ii) implementation; (iii) data collection and analysis; and (iv) evaluation and onward reporting. Section two focused on which KPIs were in use at organisational level, within clinical practice and those relating to the patient experience. To reduce participant burden the KPIs most frequently reported in the literature – four organisational and seven clinical – were included as multiple-choice options. This section consisted mainly of multiple-choice questions with some open text boxes provided for participants to list KPIs used in their organisations.
Section three included open-ended questions in recognition of the fact that individual contextual factors would result in unique KPI processes and procedures within each organisation. Two final subjective questions were designed to gain an overview of how KPIs were used to influence practice.
The questionnaire ended with an invitation to participate in phase 2. As a unique questionnaire the questions were derived from the literature on the topic (Timmins 2015). Face and content validity were tested using a pilot study, when the questionnaire was disseminated to DoNs in eight comparable healthcare organisations in Australia. Based on seven responses minor modifications were made, such as the question on population size being set to allow only numerical data to be entered.

Dissemination of the questionnaire was initiated through an email sent to the Chief Nursing Officers of each country (n=5). This email included a request that it be forwarded to the DoNs for each healthcare organisation in their respective jurisdictions via their email distribution lists. The email took the form of a letter of invitation and a participant information sheet. Participants had the option to complete and return a Microsoft Word copy of the questionnaire or to follow a hyperlink embedded in the body of the email that provided access to the online questionnaire.

Qualitative data collection

Phase 2 took priority (Morgan, 2014), given that it explored the influence of KPIs on nursing and midwifery practice in an organisational context. Three semi-structured interview guides were developed from the literature and key findings of the quantitative phase. The questions were tested with two nurses who had managerial knowledge of KPIs. Questions were largely the same and contextualised during the interview according to the level of the participant.

DoNs appointed a local collaborator to liaise with the researcher for governance processes and to identify potential participants. Based on the large number of maternity KPIs identified in phase 1, and a lesser number of community KPIs, the local collaborators were asked to include clinical managers working in maternity and community settings (where such services

were provided). Selection criteria for participants included willingness to take part and involvement with KPIs. Local collaborators were provided with a participant invitation and information leaflet to disseminate to those nurses and midwives who met the criteria. They were asked to forward contact details of potential participants to the researcher. This helped to minimise researcher bias in the selection of participants, whilst collaborator bias was minimised pre-interview by participants being contacted by the researcher to confirm their willingness to participate. Digitally recorded interviews took place at locations chosen by the participants (n=33) with a further two interviews conducted by telephone. Interviews lasted between 35 and 85 minutes. Guba's (1981) assessment criteria were employed to verify the rigour of the second phase. The authors met frequently to establish the authenticity and trustworthiness of the research. Interview transcripts were coded by the first author and reviewed by the second and third authors to allow for an assessment of coding validity.

Ethical considerations

Approval for this study was granted by the Ulster University Research Governance Filter committee and by the host NHS organisation (182245/977040/14/937). In addition, approval was also sought from the regional NHS research coordinating bodies in phase 2. Following this, approval was sought from and granted by the Research and Development offices of the organisations involved, following their research governance protocols. In phase 1, return of the completed questionnaire was deemed as providing consent. Anonymity of the organisations was assured through deletion of the IP that was automatically recorded by the Qualtrics (2015) system. In phase 2 all participants provided written consent. Data were anonymised during verbatim transcription. All participants were informed of their right to withdraw from the study at any point.

Questionnaire Data Analysis

Questionnaire data (n=66) were exported from Qualtrics into the Statistical Package for Social Sciences ((SPSS) Version 22). Eleven mailed responses were manually added. Analysis focused on cleaning the data, ensuring KPIs met pre-determined criteria (Table 2) and analysing frequency and descriptive statistics for all variables. The response rate for questions in the multiple-choice section varied. If a respondent did not collect data on a particular KPI they did not respond to that question, and the response rate was adjusted accordingly. The qualitative data which identified the KPIs utilised were transferred to a spreadsheet in Microsoft Excel. The KPIs were grouped into organisational, clinical, field-specific and patient experience KPIs. This provided an overview of the KPIs measured across the UK and ROI. Finally, the descriptive qualitative data related to organisational processes were transferred into a second Excel spreadsheet. Summative content analysis was then applied to the data whereby the content of the open text box responses were colour coded and message elements such as words or phrases were counted to determine emphasis and themes of various topics, followed by the interpretation of the underlying context (Hsieh and Shannon, 2005). This data provided analytic paths of inquiry to gain the perspectives of nurses and midwives working at executive and managerial (meso) and clinical (micro) levels in phase 2.

Qualitative Data Analysis

The six-step thematic analysis framework devised by Braun and Clarke (2013) (Table 3) was used as an inductive approach to analysis, allowing the exploration to stay as closely linked to the data as possible. This also ensured that the full breadth of participant perceptions of KPIs was captured. Audio-recorded data from the semi-structured interviews were transcribed verbatim by the researcher. Finally, data sets from both phases were integrated.

Findings

Phase 1 findings

The response rate for completed questionnaires (n=77) was 15% with representation from all five regions across the UK and ROI, which included hospital and community organisations. This provided a spread of responses that reflected the target population (Cook et al., 2000). The organisational profile is presented in Table 1. Findings from the multiple-choice and open text boxes were integrated where relevant and are presented below following the order laid out in the KPI performance process model (Artley and Stroh, 2001).

In exploring the range of KPIs, questionnaire respondents listed 1058 data items in the open text boxes. However, not all of these could be defined as KPIs. For example, data items included data collection and reporting methods, data suggestive of care planning tools and statements of opinion such as “too many to list” and “too many and even more coming”. To remove items that were not measurable or particular to nursing and midwifery, criteria were developed from the literature against which the listed KPIs were assessed (Table 2). Following grouping and cleaning, the number of KPIs was reduced to 132.

There were 40 KPIs identified as specific to nursing and midwifery practice. Examples of KPIs deemed not specific to nursing and midwifery included “caesarean section rates” and “percentage of stroke patients admitted to stroke unit within four hours”. In addition, quasi-KPIs were identified – data items which almost, but not completely, resemble the criteria due to lack of a defining measurement or that were not high-level (Table 4). Of the 23 KPIs identified across the specified fields of practice, most were reported in maternity. Two respondents each listed over 100 maternity data items, which were reduced to 14 KPIs after cleansing and grouping. Of the 14 respondents who provided data from community services, six community-specific KPIs were identified. On average, 84% (n=65) of the 77 organisations collected the four organisational and seven clinical KPIs which were included in these multiple-choice questions (Figure 2 and Figure 3 respectively).

In relation to the findings set out below, respondents were only required to answer those parts of each question that were relevant to them. Therefore, the total number of responses in some cases fell short of the population size of 77.

Factors influencing organisational KPI selection

70% (n=37) of 53 respondents indicated that meeting national requirements was a factor in deciding which KPIs to measure, with quality and safety issues being notable as factors influencing KPI selection (55%, n=29). When asked if they used patient experience KPIs, 78% (n=60 of 77 respondents) answered positively. However, many of the KPIs listed as examples

were in fact methods of collecting patient experience data such as surveys, questionnaires and audits. Only one of the original 118 patient experience data items was identified as a measure of patient experience (Table 4).

KPI data collection and analysis

When asked how frequently KPI data were collected, 92% (n=71) of respondents indicated this was monthly. Managers were largely responsible for collecting organisational data (91%, n=70), while clinical or clerical personnel were responsible in 9% (n=7) of cases. When asked who analysed the organisational KPI data, 76% (n=59) of respondents identified managers as being responsible, while clerical staff were least likely to analyse the data and 13% (n=10) of organisations employed an "other" to analyse KPI data.

Clinical KPI data were primarily collected by clinical staff (88%, n=68) through a combination of both paper and computer-based methods. In contrast to the organisational KPIs, clinical nurses and midwives (69%, n=53) as well as managers (64%, n=49) were the main analysts of clinical KPI data. Custom designed IT systems were the main method by which KPI data were presented (65 %, (n=42/65)).

Reporting and involvement of clinical nurses and midwives in KPI use

61% (n=34) of respondents identified reporting structures where clinical nurses and midwives had the opportunity to discuss KPI results. In contrast, three responses indicated a top down approach to the reporting of KPI data, where information was "reported to front line staff". Data collection was by far the most frequent way in which clinical nurses and midwives were involved in KPI use (Figure 4), with only 4% (n=2) reporting the involvement of nurses throughout the process from KPI development to performance reporting.

Mechanisms to support and encourage action on KPI data

The majority of respondents (94%, n=53 of 56) identified a range of strategies to encourage action on KPI data. These included mechanisms to enhance communication such as display boards, action plans and organisational groups including nurse practice committees, divisional quality meetings and a range of specialist teams. In contrast, one respondent identified only "admin and IT resources" as support mechanisms and described these as "inadequate", while another simply stated "nil". When the communication strategies were analysed in more depth, some form of practice monitoring was reported by 68% (n=38) of respondents. This took the form of reviews, audits, tracking change and action plans.

Shared learning and comparing performance were reported as ways to encourage action on KPI implementation such as "visible comparative performance between teams/wards". In addition, 29% (n=16 of 56) of respondents identified some form of challenge or being held to account as a support mechanism. These were captured in responses such as "performance management", "Confirm and Challenge meetings" and "presentation of action plans for non-compliance". 20% (n=11 of 56) stated that practical support measures were available such as additional funding, reconfiguring of services, specialist services, quality improvement staff and practice development staff. A further 11% (n=6) identified some form of staff training to help them understand KPIs.

Examples of when KPI data were used to improve practice

Of the 44 examples specifically related to nursing and midwifery KPIs, most related to clinical practice as opposed to organisational, community or midwifery practice. Table 5 provides the examples.

KPIs most valuable for determining the quality of care

Within this free text box 88% (n=39 of 46) identified at least one KPI they considered valuable for measuring quality care. However, 22% (n=10) highlighted that they could not, or found it difficult to, select just one KPI. Five respondents (n=10) stated that more than one source of information was needed to provide the "triangulation of information across clinical and workforce indicators that gives the richness of data necessary" [DoN3]. Figure 5 demonstrates the range of KPIs identified as being of value.

Phase 2 findings

In phase 2, participants included directors of nursing (n=7), senior managers (n=8) and clinical managers (n=20). Table 6 provides an overview of participant profiles. Although interview responses were gathered from meso and micro levels of nursing and midwifery it was noted that there were many commonalities within their responses. Therefore, their responses were woven together to articulate the perspectives of each level within two themes and six sub-themes.

The leadership challenge

Analysis of the data suggested that a connection existed between the choice and effective application of KPIs, and the leadership from those setting the strategic direction for KPIs nationally for nurses and midwives working in clinical practice. However, there were numerous challenges reflected in the sub-themes.

Voiceless in the national conversation

While the intention of the national bodies was generally believed to be "noble" [DoN5] and the KPIs were "there for a reason" [DoN8], senior nurses and midwives reported that the mandated KPIs did not necessarily evidence their work and they felt powerless to influence this agenda:

> "the national ones are mandated, you have to do it…" [SM6].

Participants expressed frustration and concern that some KPI data were collected for statistical purposes rather than care improvement. While the cost to the health service was clear, there was no reported benefit in terms of feedback:

> "We are accountable to three [councils]… different information and they call them KPIs. We submit a huge amount of data each quarter… If we were to cost that… it'd be staggering. Some is nationally driven in terms of understanding demographics, the cause of trends… we're being asked to...achieve x, y and z... How does that translate to improvements?' Often the people that we submit to can't answer that question" [DoN8].

The need to meet national KPIs for financial benefit was of concern in most organisations, especially when mandated KPIs competed with organisational KPIs for limited resources.

Furthermore, it was reported that sometimes the financial imperative was what drove improvement leading to issues with sustaining practice, especially if a KPI was not seen as relevant:

> "The harsh reality sometimes is as soon as that target and that money goes, people resort back to old practice. That's the challenge… because often it's been the money and that focus that's related to the improvement" [DoN4].

Overall, it appeared that there was a reluctance to stop or reduce KPI data collection, despite participants' concerns about the growing number and resultant pressure it placed on nurses and midwives. The failure of people in positions of leadership to address this resulted in frustration, especially for those who were aware that it is "false reassurance, that because you're monitoring everything that it will deliver what you need" [DoN6]:

> "Everyone wants their own KPIs, but for a nurse on the frontline they all become completely accumulative and unmanageable and it's sometimes unclear why they're doing it" [SM4].

Aligning KPIs within the practice context

At both national and organisational level, there was a need for those in senior leadership positions to listen to the "people on the floor… they'll know what's gonna make a difference" [CA1]. The lack of collective agreement in terms of which type of data were deemed valuable was compounded by reporting that clinical nurses and midwives had limited involvement in the selection of KPIs. This was a concern as they stated there was a lack of consideration given to how some KPIs aligned to practice contexts. Where KPIs did not align with practice need, participants said they tolerated data collection but did not use the data for improvement work:

> "You tick the boxes on the ones that aren't [relevant]… and everyone gets off your back. Then you do the ones that are… the most meaningful" [CM4].

Questioning why so many midwifery KPIs had been identified and how these could all be actively used to improve practice led to opinions that midwifery had the "highest amount of litigation" [DoN3] and that midwives acted as "independent practitioners" [DoN5]. Thus, there was a belief that:

> "The hospital has produced a very negative, very risk averse, very scary place for midwives to work… and KPIs have become a comfort blanket without a real understanding of whether they are leading to an improvement" [SM4].

In contrast, only seven per cent (n=9) of the KPIs listed were specific to community practice. The limited use of community-specific KPIs was commonly stated to be influenced by challenges in identifying which aspects of practice to measure and lack of role clarity, with district nurses finding it difficult to align KPIs to their practice:

> "We are involved in so many different areas that criss-cross with GPs, social services and other teams. Plus, the complex issues that we deal with... It will be informal… there's no set pattern to what we do" [CC7].

Listening to those who matter

Inviting service users and clinical staff to specific committees was employed by leaders as a method to inform "the development of organisational service strategies" [DoN4] or to

provide feedback on designing KPI systems. When nurses felt they were not being listened to, they over-ruled the KPI target:

> "No KPI target can do the individual patient assessment… if we breach the target, we breach the target... my contract says that I act in the best interest of the patient" [CC2].

While aspirations to listen to those who matter was a consideration for KPI selection, measures of patient experience were mainly limited to surveys. Participants described a desire for constructive service user feedback, but surveys were discounted as ineffective due to potential patient physical or cognitive impairment, a desire not to offend staff, delayed feedback, response apathy and a lack of detail useful for improvement:

> "the generic comments at the end maybe 'had a good experience', something that you wouldn't get a lot more data out of" [CA8].

The perceived reluctance of service users to provide critical feedback provided limited information which could be used for improving practice: "if I'm not doing something okay, tell me, so that I can make a difference for you" [CM6]. Interviewees reported that complaints often acted as proxy patient experience KPIs. Despite this, phase 2 interviewees considered that it was important to use a set of KPIs that captured the totality of the patient's experience. For example:

> "Unless you're also measuring the patient experience, you could have been very efficient in hitting the target about getting them in and out of the department, but they could have had a dreadful experience" [DoN3].

To achieve enhanced feedback a range of activities were described: the use of social media; collection of patient stories/diaries; and patient/client engagement in development work. However, there was a perception that, at Board level, professional colleagues may disregard narrative data:

> "We could raise the profile of patient feedback. At Board meetings they have a patient's story but I'm not 100 per cent certain that it's there with the finance figures… on a par" [SM7].

Taking action

Taking direct action on KPI findings was stated to be the responsibility of the clinical leaders, who were held accountable for their own KPI data, although few DoNs stated that clinicians were involved in driving improvement. Participants described how, if KPIs were meaningful to their practice and patients, they would be more likely to own and engage in their use and act on data.

Establishing ownership and engaging staff

The challenge of sustaining staff interest in KPIs was reported by all participants, with it being noted that when people are doing the same thing continually, "it stops meaning much" [DoN3]. This along with a focus on KPI targets was also reported to cause healthcare professionals to forget the overarching purpose of improving practice. Methods to ensure sustainability included involving nurses in the introduction of KPIs and the related development of their practice:

> "The more that we can generate this kind of activity from the bottom up rather than top down, the more likelihood there is of ownership and sustainability round it" [DoN3].

Participants described how, if KPIs were meaningful to their practice and patients, they would be more likely to own and engage in their use and act on data. Feedback, and their ability to understand it, also made a difference to whether they engaged in improvement work:

> "I understand the dashboard, I think it's important that we're reviewing our rates, that we're constantly looking at how we can improve our care." [CM7].

In contrast, participants reported various difficulties with the management of their data including few IT systems that could communicate with each other, causing frustration in locating and viewing KPI data as a whole: "we use loads of different spreadsheets; how can we bring it together?" [SM4]. However, understanding KPI measures relies on more than the use of numeric data alone. Participants reported needing to "see" the impact of that data. If evidence of patient impact was available, such as hearing a family's story as a live experience following a root cause analysis, or wider group discussion following a complaint, then this resulted in greater learning opportunities:

> "We got the team to come and present their experiences... Whilst that's difficult for some people, it's part of our philosophy about being open and transparent so we can learn" [DoN6].

Checks and balances

Providing the organisations' Executive Boards with assurance that KPIs were being used and acted upon was reported as a check and balance mechanism, and increased confidence in the KPI data produced. However, participants highlighted that the level of understanding of KPIs varied and that comprehending what a KPI was and was not, presented them with difficulties:

> "I find a bell curve distribution… people who really get KPIs - use them pro-actively, get people ingrained in understanding them. A good group in the middle who get most of them, use them intuitively to support improvements…, and there are some people who just don't understand KPIs full stop" [DoN6].

Clinicians reported that their preparation to record, analyse and action KPIs was often informal and provided by their direct line manager. Consequently, training quality varied, with clinical managers resorting to the use of online resources. There was uncertainty, with individuals commenting: "I think I'm reporting the right things" [CM7].

Using the audit process as a means of measurement for KPIs seemed to be the most common tactic employed. However, this placed demands on nurses and midwives through the effort involved. Some organisations were reportedly in the process of identifying how heavy their audit commitment was, with one organisation employing "over 500 audits" [DoN4]. This also led to confusion as to whether "you're auditing or whether this is a performance indicator that we need to be measuring ourselves against" [DoN1]:

> "People are spending inordinate amounts of time writing the biggest load of rubbish. And then other poor people are spending inordinate amounts of time auditing the biggest load of rubbish" [DoN3].

Closing the loop

Performance feedback is an important means of motivating nurses and midwives to take ownership of and act on KPI data. However, interviewees revealed that while managers stated that "they're not having to collect [KPI data] for it to fall into some sort of bottomless pit, they get this information back" [DoN3], clinicians reported issues in receiving or accessing this feedback:

> "It's collected… and then it goes off into the wide blue yonder, we get very little feedback. We get feedback if it's not done... Whether it makes any difference to the patient outcome, I'm not sure" [CC3].

Thus, the data were limited in application to practice, meaning that the full cycle of KPI employed, from development through to identification of practice improvement, was lost and the loop was not closed. In contrast, participants representing 50% (n=4) of the organisations in phase 2 reported adopting formal facilitated support as a way of converting the raw KPI data into action to enrich practice – for example, working with the multi-professional team and with management support to release nurses and midwives.

Discussion

The findings suggest that organisations collect and monitor an extensive number of nationally mandated KPIs. Data indicate that an increasing number of KPIs have been developed since a previous report by the National Nursing Research Unit (Griffiths et al. 2008). This proliferation of KPIs is contrary to the recommendations for parsimony laid out in government papers and policies (Francis, 2013; DoH, 2017a). Despite the strategic call for a shift in culture from command and control to collective leadership, nurses and midwives considered their views were not embedded in conversations relating to which KPIs should be monitored and measured (DoH, 2017b; Cardiff et al., 2020). Alongside this, there is limited incorporation of patients' views into organisational practice, which is contrary to the advice of the National Advisory Group on the Safety of Patients in England (2013). Thus, participants questioned if current KPIs really measured what mattered most to patients and clinical teams (Berwick, 2015; McCance et al., 2020)

Management of KPI data

Findings reveal that collecting data for a high number of KPIs, without considering how the data will be used to inform practice, is contrary to policy recommendations (DoH, 2008; HIQA, 2013; DoH, 2017a). Participants claimed that data collection was performance focused and burdensome, particularly when they perceived that the mandated data were not always reported on or were not provided in time to drive improvement. This mirrors the observations made by Heslop (2014) who raised concerns that data may be used for monitoring purposes rather than with the aim of reducing patient risk. A contributory reason for the proliferation of KPIs is the directive for development of measures that evidence safety, quality and compassion in care arising from national enquiries into healthcare failings (Francis, 2013; Bubb, 2014; Heslop and Lu, 2014). However, this increase in public organisational accountability has resulted in negative behaviours (as surmised by Ossege, 2012) including a culture that emphasises performance monitoring and holding to account. Due to the centralisation of national monitoring and its distance from the practice setting, there is a

misguided sense that having big data will provide the requisite assurance of performance. However, it is not the quantity of data, but rather the quality of the questions asked of that data that is important (Marr, 2018). This is then replicated within organisations, with reports of data being collected unnecessarily. This study suggests that the importance of burden not exceeding benefit, as stipulated in national guidance for nursing and midwifery KPIs (DoH, 2017a), has been outweighed by nurses' anxiety about performance management.

These findings resonate with those of other researchers who unearthed that it can be challenging to ensure large volume KPI measurement translates into action and enhanced quality of care, both within and across organisations (Mannion et al., 2016). This is problematic given the cost, time and effort involved, not only in the implementation of KPIs but also in the management of KPI data (Grimshaw et al., 2012; Mannion et al., 2016). Efforts have been made to address the associated workload of KPI implementation through the development of core measures or minimum data sets. This study identified that computer-based systems are chiefly used, except in community settings, which is contrary to previous reports that refer to the under-use of computer systems (DoH, 2008; Donaldson et al., 2014). It was noted that all organisations employed several systems. However, phase 2 respondents revealed that current IT systems were rarely capable of 'talking' to each other to merge the required information into one KPI database. This caused duplication, confusion and frustration rather than aiding understanding and decision-making (Parlour et al., 2013). Furthermore, participants considered that those working at a macro level desired KPI data mainly for monitoring or statistical, health and socio-demographic purposes. This was inconsistent with their view of KPIs having a practice improvement role, which was overshadowed by the chase for the metric.

Despite respondents confirming that their organisations provided methods of displaying KPI results, many nurse and midwife participants reported a lack of understanding of what the data were telling them and failed to see its relevance to their practice. Burston et al., (2013) support these findings suggesting that, notwithstanding progress in the collection and reporting of KPIs, they remain at the periphery of clinical practice. It has been argued that staff being responsible for data collection potentially has merit in aiding the ownership and understanding of KPI data (Dubois et al., 2013; Sim et al., 2018). However, participants in this study considered that being responsible for KPI data collection was insufficient *per se* for aiding their understanding of KPIs, as it offered limited engagement with the full KPI process. Rather, they highlighted that having opportunities to select relevant KPIs, and meeting to discuss KPI data as a team, would offer greater insight and ownership and lead to greater service improvements. Notably, the facilitative support provided by a few organisations offered opportunities for shared learning and engagement in decision-making regarding the use of KPIs.

Measuring what matters

Berwick (2015) called for a 50 per cent reduction in KPIs. Nevertheless, the pressure to collect data was found to be immense. Furthermore, the qualitative findings revealed that DoNs were not always aware of all the data that were being collected – for example, some interviewees stated that intensive care and midwifery data were reported through medical channels – and consequently the volume of KPI data collected from responses provided by the DoNs may have been underestimated. Reflective of other studies, the concept of being

more discerning and measuring what matters was important for nurse and midwife participants (Cardiff et al., 2020; McCance et al., 2020). However, the discrepancy between what organisations measured and what nurses and midwives valued as feedback to improve practice offered a challenge for all. Nurses and midwives stated they valued narrative feedback from service users as it provided additional insight to the numeric KPI data collected. This is in keeping with the observation that the strength of caring can best be found in qualitative data, while also increasing opportunities for improvements (Marr, 2018). Patient experience KPIs were outlined in the questionnaire as being the second most valuable KPI for determining the quality of care. Despite this, interviews revealed that the fear of litigation and adverse negative publicity for an organisation play a role in defining what is important and requires attention. The need to obtain and use multiple evidence sources in order to improve the quality of care, including research, policy, clinical experience and patient preferences/experience, has been identified by a variety of researchers (Harvey and Kitson, 2016; Turner et al., 2017; McCance et al., 2020). Findings from this study suggest that there may be a requirement for organisations to extend their thinking on sources of evidence to gain a more eclectic form of measurement to improve practice.

The argument for engagement of clinical staff and service users in all aspects of KPI management is strengthened given the scarcity of indicators in primary care identified in this study. While research has yet to demonstrate what best practice is for certain aspects of community care, the significant increase in focus on person-centredness in recent years (Ward et al., 2018) presents an opportunity to develop KPIs which are sensitive to the experiences and feelings of patients being cared for in their own homes. KPIs that are meaningful to this group are crucial for their engagement if their experience of care is to improve (McCance et al., 2020). Research undertaken with nurses and service users has led to the development of person-centred KPIs (McCance et al., 2012). Tested in a range of different clinical settings, these eight KPIs and measurement tool have been shown to generate evidence that enhances the engagement of nurses to make changes in practice (McCance and Wilson, 2015, McCance et al., 2020). KPIs such as these would help to ameliorate the struggle experienced by district nurses in trying to identify what should be measured, and contribute to an enhanced care experience.

Collective leadership

The Royal College of Nursing (RCN) in Scotland (2016, p.5) have highlighted the necessity for an “exit strategy” to be built into KPIs, acknowledging the need identified in this study to consider their ‘retirement’. Despite this, only the requirement for regular KPI review is reported (RCN Scotland, 2016; DoH, 2017a). There is a deficit of advice or mechanisms on stopping or reducing the frequency of data collection. Consequently, the findings reported here indicate that effective KPIs, which are well embedded in practice and achieve consistent compliance, continue to be collected at monthly intervals, years later. Some organisations had taken steps to review and reduce the internal data they collect, but the findings revealed little evidence of organisational leaders being able to influence decision-making at a macro level. This suggests that a key role of macro leaders, in terms of transforming cultures and shaping the context to prepare it for change (Kitson et al., 2008; Rock and Cross, 2020), is not being realised to its full potential.

By virtue of their role, DoNs as organisational leaders, have a unique advocacy responsibility for nursing and midwifery, through which they can not only raise concerns on behalf of staff but can influence change for improvement. However, phase 2 findings revealed that, although DoNs were aware of staff concerns relating to the high number of KPIs gathered, when it came to influencing change external to their organisations, they often felt powerless. Participants held that external bodies curtailed organisational and clinical risk-taking for practice innovation and improvement by encouraging instead a culture focused on monitoring for assurance, contrary to guidance (National Advisory Group on the Safety of Patients in England, 2013). Whilst they did challenge the usefulness of some KPIs, there was limited evidence of constructive negotiation with the mandating bodies. Why this occurred is beyond the remit of this study and may be an important area for further exploration. This resonates with the key messages discussed by Berwick et al. (2017) who argue that speaking as a collective voice to policy makers can result in leaders discovering that most obstructive, non-regulatory rules are within their power to change.

Irrespective of the challenges, interviewees in all organisations in phase 2 reported providing some form of quality improvement support to aid cohesive team-working and decisions that translated into action. As highlighted previously, this often fell short of what nurses and midwives perceived they required to influence practice in an effective and consistently meaningful way. Nonetheless, in organisations where KPIs appeared to have a strong impact on driving improvement, there was evidence of a collective leadership culture, with those interviewed displaying the traits and behaviours of transformational leaders (Kouzes and Posner, 2002; West et al., 2014). Interviewees in these organisations clearly articulated the role KPIs played in their practice, acknowledging their role in leading the development of high-quality care. They reported being familiar with their KPI data and could relate to how it drove practice change. In these organisations, nurses perceived themselves to have autonomy to act in the best interests of their patients; they challenged authority and adapted practice on their patients' behalf even if it deviated from KPI compliance (Rambur et al., 2013; Greenhalgh et al., 2014; Phelan et al., 2020). Several authors emphasise that it is those people making the changes in healthcare who know most about the context and the mechanisms that will work to effect change (Berwick, 2015; DoH, 2017b; Cardiff et al., 2020). However, they stress that equipping clinical staff to actively and objectively study their practice is reliant on a culture that is supportive of collaboration and collective leadership. As supportive collaboration and collective leadership were not evident in all organisations, it is apparent that, if KPIs are to realise their aims, ongoing change is required across healthcare organisations.

The findings of this study reveal that applying specific nursing and midwifery KPI evidence to practice is challenging. Nurses and midwives remain unaware of the benefits that can be gained from improvement science despite calls for a more inclusive approach (Berwick, 2015; Sierras-Davo et al., 2021). Based on the evidence from this study it would appear that the successful implementation of KPIs for quality improvement would benefit from being underpinned by theories of implementation science (Greenhalgh et al., 2004; Burston et al., 2013). The innovation of practice is by its nature unique, requiring implementation designs to be flexible programmes of action where nurses and midwives are encouraged and supported to take calculated risks and try new ways of doing things (Berwick, 2015; DoH, 2017b). Given that KPIs, quality assurance and safety are embedded in the culture and context of an

organisation, it is essential that any implementation science tool takes account of these factors if sustainable changes in practice are to be realised.

Limitations

A chief limitation of this study was that only 77 valid questionnaires from all five countries across the UK and ROI were received providing an overall response rate of 15 per cent. Although low, Anseel et al. (2010) argue that this is the anticipated response rate from participants at a directorial level. Additionally, as the questionnaire was not designed to allow conclusions to be drawn about the sample itself, the response rate was less important than obtaining a spread of responses that reflected the target population (Cook et al., 2000).

In phase 2, recruitment was organised by a local collaborator within each of the participating organisations in line with ethical protocols. However, the potential for collaborator bias is acknowledged: all participants volunteered but they may not be representative of the wider nursing and midwifery population. Also, registered nurses working at ward level were not included in this study, and while this would have helped to confirm the perspectives expressed about the lack of understanding regarding KPIs, it is debatable whether more insight into KPI use would have been gained by their inclusion.

Conclusion

This study has identified a large number of KPIs currently in use across the five jurisdictions in the UK and Ireland. Findings also reveal the lack of a strategic overview nationally and organisationally, resulting in a failure to address the growing number of KPIs in use at the clinical level which is negatively impacting on nursing and midwifery workload, patient care and healthcare cost. Although policy stipulates that choice of KPI is crucial and measurement should be based on those aspects of care that are important to nursing staff and patients, the evidence indicates that this is not happening. Findings confirm that inconsistent leadership is a barrier to successful practice improvement, and the expectation that KPI implementation will lead to improvement in practice is not supported. Nurses and midwives struggled to understand how all the KPI data they collected were relevant to their practice. They highlighted the need for support to understand KPI data as a mechanism for generating evidence to improve practice, and their involvement in decision-making regarding all aspects of the KPIs they use. Where organisations foster a culture of continuous quality improvement with visible collaborative leadership and accessible facilitated support and resources, findings show that KPI data advances beyond assurance to become a positive influence for improvement.

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Table 1. Organisational profile characteristics

		Number	Per cent of total
Responses per region	England (165 Foundation and non-Foundation Trusts)	32	42
	Northern Ireland (5 Health & Social Care Trusts)	5	6
	Scotland (14 Health Boards)	7	9
	Wales (8 Health Boards and Trust)	2	3
	Republic of Ireland (310 Public and voluntary health care including primary care)	31	40
Population size served	≤ 1000	33	56
	1001 - 10,000	2	3
	10,001 - 50,000	2	3
	50,001 - 100,000	2	3
	100,001 - 500,000	15	25
	500,001 - 1 million	2	3
	> 1 million	3	5
Population served	Rural	7	9
	Urban	10	13
	Both	60	78
Services provided	Acute	15	21
	Community	19	26
	Both	39	53
Areas of practice[1]	Adult	70	91
	Midwifery	57	74
	Children's	60	78
	Learning disability	34	44
	Community	48	62
	Mental health	31	40
Total staff employed	≤2000	31	40
	2001-5000	14	18
	5001-10000	15	19
	10001-15000	10	13
	15001-20000	2	3
	≥20001	5	7
Number nurses employed	≤ 1000	36	47
	1001-3000	21	27
	3001-5000	10	13
	5001-7000	6	8
	7001-9000	0	0
	≥9001	4	5
Number midwives employed	≤1000	49	91
	1001-3000	5	9
	≥3001	0	0

[1] Organisations may provide more than one area of practice therefore the aggregate response rate exceeds one hundred.

Table 2. Criteria used to define KPIs

Criteria	
1.	Evidence the nursing and midwifery contribution
2.	Define what is to be measured
3.	Have an evidence-based rationale
4.	Contribute to meeting an organisational goal
5.	Have a defined target
6.	Be easily understood and provide context
7.	Require information which is straightforward to collect from a legitimate source
8.	Lead to action, either to maintain consistency or to improve performance.

Table 3. Phases of thematic analysis (Braun and Clarke 2013)

Phase	Description of the process
1. Familiarisation with your data:	Transcribing data (if necessary), reading and rereading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic "map" of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 4. Nursing and midwifery specific and quasi KPIs

Organisational nursing and midwifery specific KPI's	Organisational nursing and midwifery quasi KPI's
The number of compliments (n=10)	Preceptorship of nursing students (n=1)
Actual daily staffing percentage achieved against the planned level of staffing (n=1)	Special leave. Maternity leave. Study leave (n=3)
Number of nursing absences (n=59)	Agency and nurse bank usage (n=52)
Incidence of complaints specific related to nursing (n=55)	New graduate retention (n=2)
Validation of RN/RM professional registration with NMC (Nursing and Midwifery Council) (n=3)	
Nurse/midwife supervision ratios (n=1)	
Number of incidents (n=59)	
The percentage of staff in post up to date with their mandatory training, by course name (n=15)	
Number of nursing vacancies (n=59)	
Staff turnover rates (n=3)	
The percentage of employees who completed their pre- Personal Appraisal Development Review and PADR in the month due (n=6)	
Clinical nursing and midwifery specific KPI's	**Clinical nursing and midwifery quasi KPI's**
Incidence of medication errors (n=56)	Compliance with care bundles (n=4)
Prevalence of infections/HCAI (any of the following: urinary catheters, ventilator pneumonia, central lines, MRSA, C Diff) (n=55)	Right Patient, Right Blood Competency Assessment (n=1)
Incidence of falls (n=57)	Compliance with documentation standards (n=9)
Number of nurse prescribers who prescribe (n=1)	Compliance with completion of NEWS (n=46)
Incidence of pressure ulcers (n=58)	Nursing assessment compliance (n=2)
	Assessment of nutritional requirements (n=51)
	Continence screening (n=2)

	Blood transfusion errors (n=2)
	NMC Referrals (n=1)
	Pain scores (n=5)
	Compliance with hand hygiene (n=61)
Field specific nursing and midwifery KPI's	**Field specific nursing and midwifery quasi KPI's**
Mental health KPI's	**Mental health quasi KPI's**
Number of service users and staff who are participating in WRAP (recovery focused initiative) (n=1)	Mental health advocacy (n=1)
Number of special observations (n=1)	Therapeutic interventions 1:1 (n=1)
Children's KPI's	**Children's quasi KPI's**
Workforce establishment holding an accredited post registration qualification in specialist neonatal care (n=1)	Prevention of over infusion of intravenous fluids in neonates(n=59)
Midwifery KPI's	Children's Triage Score (n=59)
Smoking rate at time of birth (n=1)	**Learning/intellectual disability quasi KPI's**
Number of bookings for antenatal care (n=2)	Compliance with our policy around use of passport (n=1)
Midwife to births ratio (n=1)	Health needs assessment on an annual basis (n=1)
PPH rate (post-partum haemorrhage) (n=2)	**Midwifery quasi KPI's**
Rate of booking BMI -various classifications (n=2)	Newborn hearing screening (n=1)
Number and type of perineal tears (n=1)	Health and Social Assessment (n=1)
Percentage of VTE forms completed on admission and after 3 days (n=1)	Electronic fetal monitoring (n=1)
Number of mothers seen within 72 (or 48hrs) following discharge from hospital (n=7)	Normal Births without intervention (instrumental) (n=1)
Percentage of women receiving 1:1 care in labour (n=5)	Neonatal bloodspot screening (n=4)
Percentage of times co-ordinator is supernumerary (n=1)	
80% of women get access to antenatal checks before week 12 (n=1)	
Suturing commenced within 1 hour of delivery (n=1)	

Number of mothers exclusively breast feeding on discharge from hospital (n=11)	
Number of mothers not exclusively breast feeding on discharge from hospital (n=1)	
Community KPI's	**Community quasi KPI's**
Breast feeding rates at three months (n=2)	Child immunisations (n=2)
Breast feeding rates at nine months (n=2)	**Other KPI's**
Percentage of early years health reviews carried out by health visitors within the timescale (n=1)	Compliance with end of life care plan (n=1)
Number of children reaching 10 months who have had a developmental assessment (n=3)	
Number of mothers not exclusively breast feeding at 3 months (n=1)	
Neonatal blood spot screening results received by 12 days post sample taken (n=1)	
Nursing and midwifery patient experience KPI's	**Nursing and midwifery patient experience quasi KPI's**
Call bell response time (n=2)	Were you treated with care and compassion? (n=1)
	Patient satisfaction with: emotional support; comfort; nutrition and eating experience; communication; information provided; hand hygiene; respect; pain control; attitude (n=3)
	Percentage of person-centred plans (n=1)

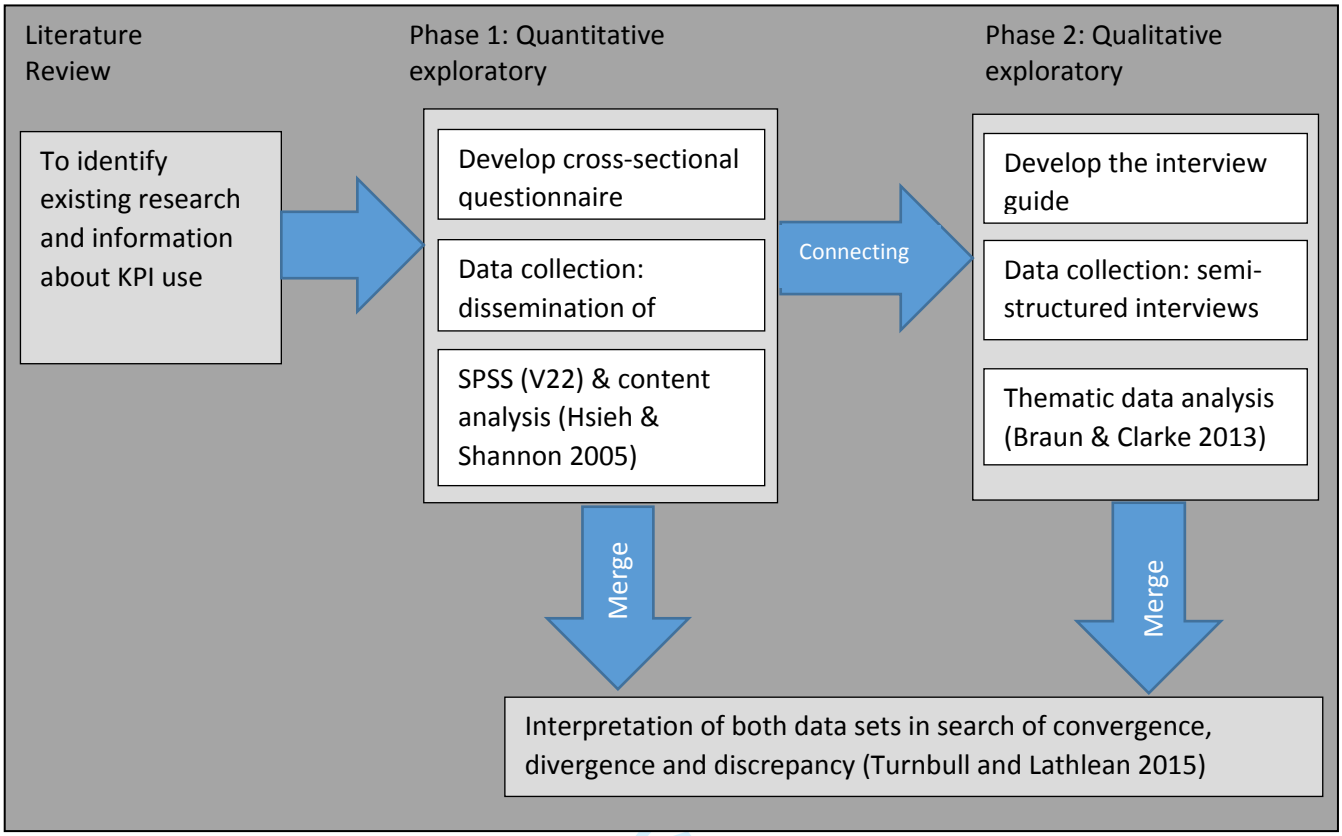
Table 5. Nursing and midwifery clinical practice improvements resulting from the use of KPI data

Aspect of practice measured and number of examples	Action taken and/or improvement achieved
Number of infections n=5 Time taken to isolate patient n=1	• Reduction in bloodstream MRSA • MRSA reduced through use of the Saving Lives audits • Increase in infections triggers use of root cause analysis (RCA) • Training and education. Extra resources. Equipment. • RCA used to improve dressings and care of peripheral and central lines • Reduction in time to isolate – decreased delays
Number of hospital-acquired pressure ulcers n=10	• Informed use of risk assessments in reporting and management • Implementation of new reporting system and staff training • Implementation of a skin bundle • Implementation of pressure ulcer collaborative • Root cause analysis resulted in Trust wide action plan • Implementation of specific campaign • Escalation process devised • Development of tissue viability team and implementation of '300 days without pressure ulcers' initiative
Number of prescribed medications not administered n=2	• Strengthened training in relation to diabetes • Omitted medications-an action plan/learning programme was put in place leading to a reduction in "blanks" doses
Delay time in recording observations n=1	• Implementation of RCA reduced delay in recording of cardiovascular observations
Number of falls n=6	• Prevention – significant improvement • Reduction due to use of Improvement Methodology • Reduction following introduction of improvement plan and review of compliance • Focused initiatives in identified areas of need • Escalation process devised • Strengthened compliance with assessment and interventions
Compliance with hand hygiene n=1	• Multi-disciplinary taskforce established
Number of delayed notifications of post-natal discharges n=2	• New system of e-reporting of discharge notifications • Late notification of birth – improvement plan between hospital and community led to reduced incidents and targets being met

Table 6. Phase two participant profiles

Participant roles	*DoNs n=7, senior managers (SMs) n=8, clinical managers n=20*
Clinical manager areas of service	*Acute sector (CA) n=8, Midwifery (CM) n=7, Community (CC) n=5*
Length of time participants had worked in their current posts	*Four months to eighteen years*
Length of time registered as a nurse and or midwife	*Two years to thirty-six years, with the mean being twenty-two years.* *One senior manager was not a nurse or midwife*
Registered midwives	*Ten*
Nurses or midwives working in the community setting	*Six*

Figure 1. Overview of the research design



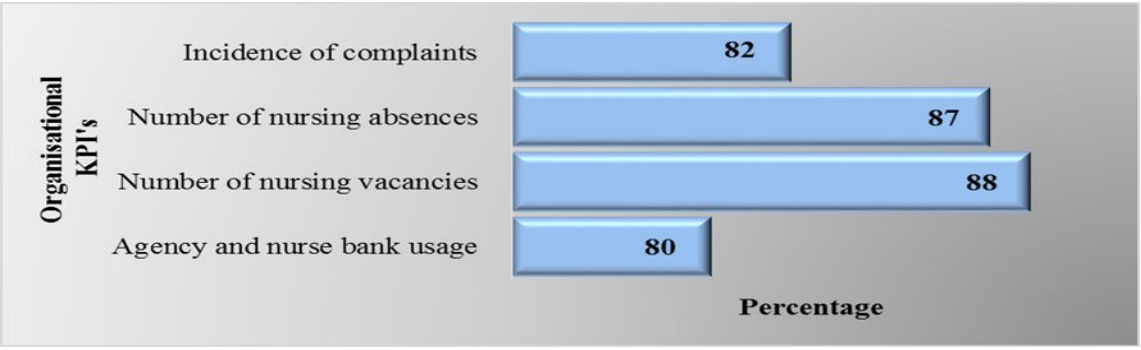


Figure 2. Percentage of organisations using the frequently cited organisational KPIs

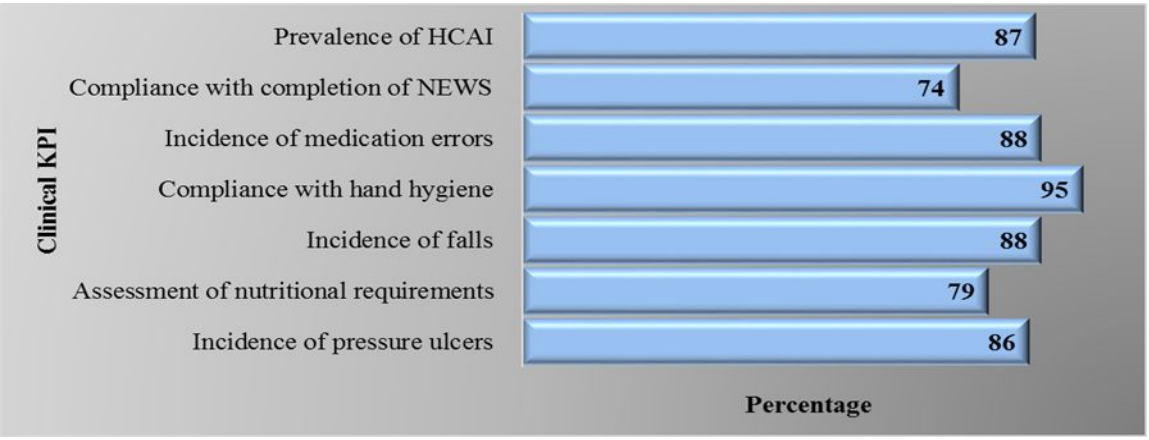


Figure 3. Percentage of organisations using the frequently cited clinical KPIs[1]

[1] HCAI = Healthcare Acquired Infection. NEWS = National Early Warning Score.

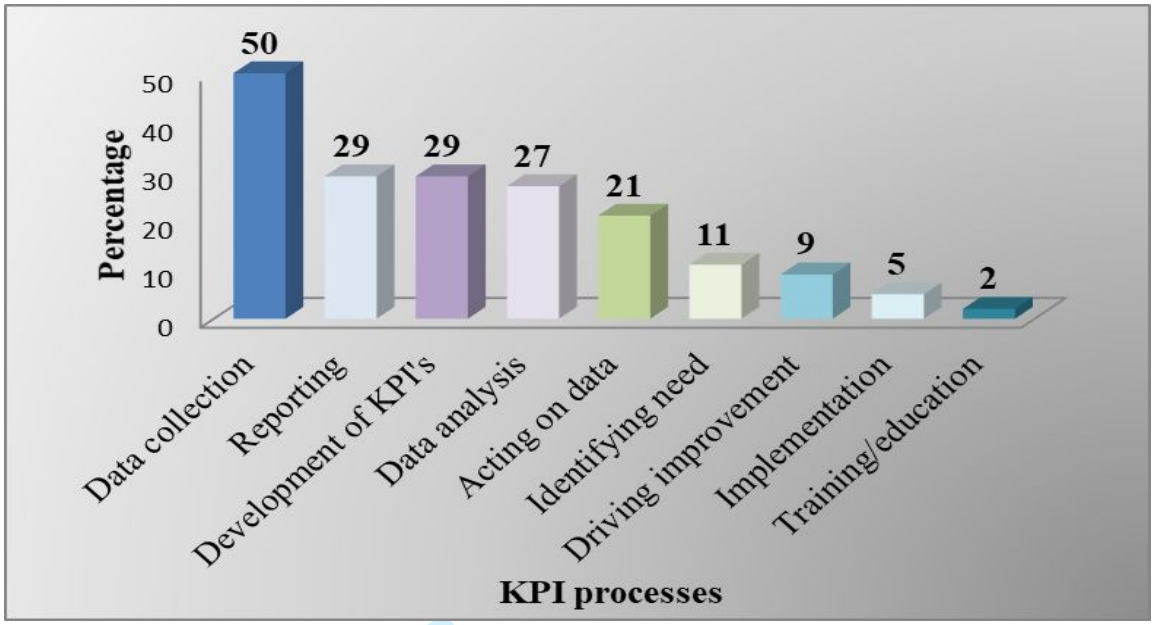


Figure 4. KPI processes in which clinical nurses and midwives are involved

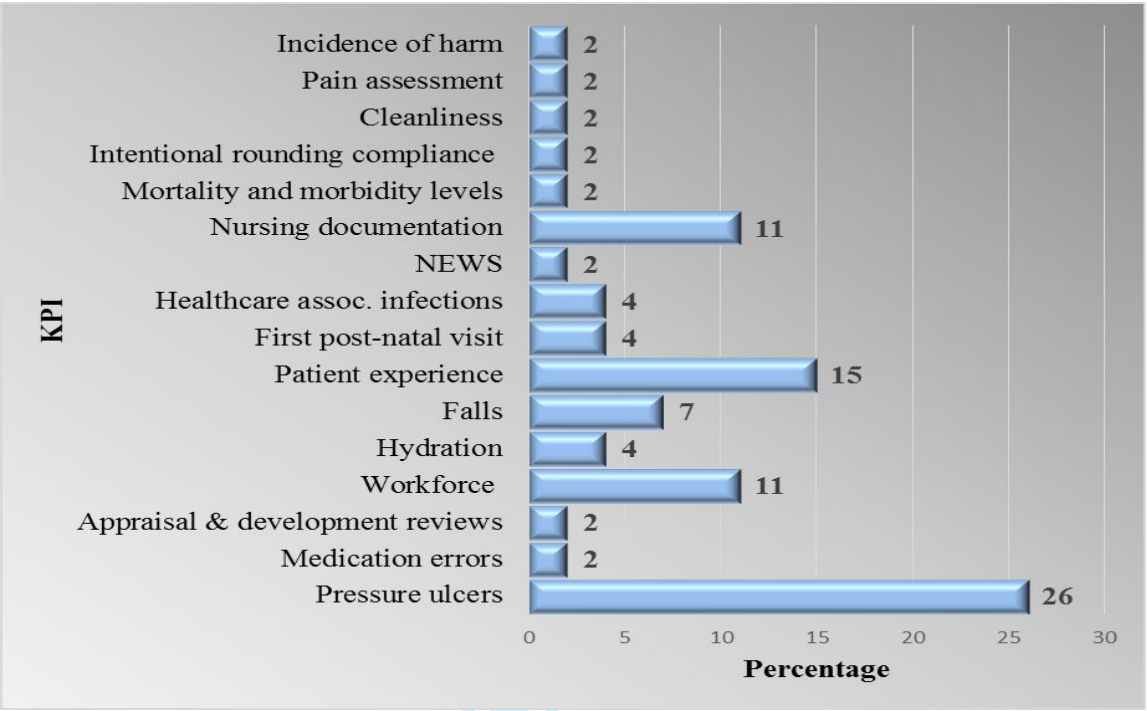


Figure 5. KPIs stated to be of value in determining the quality of care