The development of Nursing Quality Care Process Metrics and Indicators for use in Older Persons Care Settings: A Delphi-Consensus Study

Title page

- Short informative title
  The development of Nursing Quality Care Process Metrics and Indicators for use in Older Persons Care Settings: A Delphi-Consensus Study

- Short running title
  Nursing Quality Care Process Metrics and Indicators for Older Persons Care

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This article has been accepted for publication and undergone full peer review (not applicable for Editorials) but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/jan.14126

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- **Acknowledgments**

The Nursing and Midwifery Quality Care-Metrics Project was commissioned by the Office of Nursing and Midwifery Services. The research team has worked closely with the Nursing and Midwifery Project Development Unit (NMPDU) Directors, Project Officers and Work-stream Working Group members. Nurses within the older persons care setting have also contributed tremendously to the project by completing the Delphi Rounds. The team is most grateful to all the NMPDU staff, Work-stream Working Group members and all participants who have helped develop this evidence based suite of quality care process metrics and indicators for the older persons’ care setting.

- **Funding Statement**

This work was supported by the Health Services Executive Ireland.

- **Author contributions**

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ABSTRACT

Aim
To develop a suite of nursing quality care process metrics and indicators for older persons care settings in Ireland.

Background
Regulatory investigations of health system failures highlight non-adherence to clinical guidelines and standards resulting in deficiencies in nursing care delivery. Limited attention has been paid to measuring nursing care processes particularly in the care of older people. Quality care process metrics can facilitate measurement of nurse sensitive measures of care.

Design
A scoping literature review and modified Delphi-Consensus Technique.

Methods
A scoping review of literature published between January 2007 - January 2017 was conducted to identify nursing process metrics and indicators. The Delphi-Consensus phase incorporated a four-round electronic survey of 404 nurses and a consensus meeting with 13 stakeholders working in Older Persons Care Settings in Ireland.

Findings
From the review, 33 potential metrics were identified. After all Delphi survey rounds, 20 metrics and 90 associated indicators were selected by the nurses. Following the consensus meeting, 19 metrics and 80 indicators were included in the final suite of nursing quality care process metrics and indicators.
Conclusion

Developing this suite of Nursing Quality Care Process Metrics and Indicators for use in Older Persons Care Settings provided consensus on what nursing processes should be measured to improve the quality and safety of care delivery.

Impact

The nursing processes identified, provide a framework for future research and educational programmes in the care of older persons. Although conducted in the Irish healthcare system, there is potential for adoption or adaption in other healthcare settings.

Keywords

Consensus, Delphi-consensus study, Delphi technique, indicator development, metric development, nursing, nursing care process, Older Persons Care Settings, quality metrics, quality indicators.

1. INTRODUCTION

The quality and safety of patient care is an international policy issue with care quality requiring improvement (Vincent & Amalberti, 2016). In many countries including Ireland, adverse findings from healthcare regulatory investigations highlight the importance of measuring care quality and have brought public attention to the urgent need to measure, improve and provide data to ensure quality and safety in healthcare (Health Information and Quality Authority, 2012, 2015; Health Service Executive, 2016). One strategy to achieve this, has been the development of nursing metrics. These are quality of nursing care measures with nursing activities and practices identified and formulated as metric statements. For each metric statement a set of indicator statements are also formulated, which facilitate measurement of nurse delivered activities and patient experiences (Griffiths, Jones, Maben, &
Murrells, 2008). Metrics and indicators allow data to be captured, measured against agreed standards and reported. Areas of enabling action planning for improvement are identified with measures taken to increase care standards.

In 2016, dedicated funding from the Irish Health Service Executive enabled a large-scale research study to be undertaken to develop seven national suites of Nursing and Midwifery Quality Care Metrics and Indicators (Health Service Executive, 2018a). These were in the practice areas of Older Persons, Acute Care, Children’s, Midwifery, Intellectual Disability, Mental Health and Public Health Nursing. In this paper, the development of the suite of nursing quality care process metrics and indicators for nurses working in Older Persons Services will be presented.

1.1 Background

1.1.1 Quality care measures and nursing

Nurses as the largest group of healthcare professionals (Department of Health Ireland, 2015; Kurtzman, Dawson, Johnson, & Sheingold, 2010) are central to patient safety and are well placed to optimise care delivery outcomes (Aiken et al., 2014; Maben, Morrow, Ball, Robert, & Griffiths, 2012). Nursing care processes are thought to influence patient outcomes (Griffiths, 2009), but high-quality empirical evidence for this is scarce (Recio-Saucedo et al., 2018). Identifying specific nurse sensitive measures remains challenging internationally and in Ireland (Department of Health Ireland, 2017; McCance, Telford, Wilson, MacLeod, & Dowd, 2012).

Various strategies have been employed to improve healthcare quality; including key performance indicators (McCance et al., 2012), minimum data sets and nursing sensitive indicators (Jeffs, Athlin, Needleman, Jackson, & Kitson, 2018). The Donabedian Structure, Process, Outcome (SPO) model (Donabedian, 2002), has been influential in the quality care
agenda. In this model there should be connections between structure (factors in the care environment such as staffing levels), process (the direct care provided) and patient outcomes (effects on health status). In nursing these connections are hindered unless nursing care processes are identified and measured. Process metrics, therefore, relate to important, measurable care provision activities which influence patient outcomes (Mainz, 2003). In contrast to outcome measurement, process measurement measures the actual process of care delivered to patients. This has the advantage of early detection of issues allowing remedial action to take place preventing occurrence of poor outcomes (Mountford & Shojania, 2012).

For most diagnostic conditions there is insufficient information to adequately adjust outcomes for differences in case mix between providers (Griffiths, Ball, Murrells, Jones, & Rafferty, 2016), therefore, it is more efficient to measure care processes rather than outcomes (Lilford, Mohammed, Spiegelhalter, & Thomson, 2004).

1.1.2 Quality care for older people

Nursing care processes in the care of older people are also thought to influence outcomes but again empirical evidence to support this is scarce (Richards, Hilli, Pentecost, Goodwin, & Frost, 2018). As there is considerable variation in the quality of nursing care processes in services for older people, stronger regulatory frameworks have been implemented (Australian Government Department of Health, 2017; Care Quality Commission, 2018; Health Information and Quality Authority, 2016). The potential vulnerability of an ageing population highlights the need for increased accountability in delivering quality nursing care in care settings for older people. Internationally, there has been some activity in the development of metrics, indicators and associated standards for the care of older people particularly from North America, such as the National Database of Nursing Quality Indicators (NDNQI). Other examples include the American Nurses Association (ANA) (2017), US Nursing Home Compare (Castle & Ferguson, 2010), US Nursing Home Standards (US Nursing Home
Quality Measures, 2017) and the Collaborative Alliance for Nursing Outcomes (CALNOC) (2015) (which have outcome rather than process measures). Because of the type of healthcare system in North America including the MAGNET hospital movement, there has been much work around identifying and quantifying nurse sensitive-outcome indicators with less emphasis however on process measures.

Guidance for the development of nursing sensitive indicators is available (National Database of Nursing Quality Indicators, 2018). First, an indicator should be developed based on literature evidence and represent a nursing care process. Once the empirical evidence is gathered from the literature, a group of nursing experts should review the potential indicator. Following determination of the indicator’s validity by the experts, it should be tested whether the indicator is supported to be meaningful in clinical practice (National Database of Nursing Quality Indicators, 2018). This guidance framed the design of the study.

2. THE STUDY

2.1 Aim

To identify a national suite of Nursing Quality Care Process Metrics (QCPM) and relevant indicators (QCPI) for use in Older Persons Care Settings in Ireland.

2.2 Design

A two-phase approach was adopted with phase one being a scoping review of the literature. Phase two was quantitative, using a modified Delphi-consensus technique incorporating a four-round electronic survey and consensus meeting.
2.2.1 Phase One - broad scoping literature review

A broad scoping review of the literature using a systematic process was conducted. Aims were to identify nursing QCPM and QCPI in the literature, map key concepts and identify types of evidence underpinning older person nursing QCPM and QCPI (Mays, Roberts, & Popay, 2001). Scoping reviews are useful in areas where there may be a lack of empirical research evidence and conceptual ambiguity (Feo, Kitson, & Conroy, 2018). Conceptual ambiguity was evident from an initial scan of the literature, in that there was a lack of consensus on how nursing metrics and indicators may be defined (Heslop & Lu, 2014). Before proceeding to the main review, working definitions were formulated. A QCPM was defined as a quantifiable measure that captures quality in terms of how (or to what extent) nursing care is being performed in relation to an agreed standard. A QCPI was defined as a quantifiable measure that captures what nurses are doing to provide that care in relation to a specific tool or method.

2.2.2 Review search strategy

The scoping review was conducted using established and robust processes (Moher et al., 2015) using the Covidence online systematic review platform (Covidence, 2018). The search was not limited by study design but widened to include all types of sources including grey literature. The specific inclusion and exclusion criteria are detailed in Figure 1.

As this was part of a national project, the initial search was conducted for all seven areas of practice. These were: Older Persons Services, intellectual disability nursing, mental health nursing, acute nursing, public health nursing, children’s nursing and midwifery. The search limits were studies published between January 2007 - January 2017, in English language with full text. Search terms were indicator*:ab,ti OR metric*:ab,ti OR 'quality measure*':ab,ti)
AND [english]/lim AND [2007-2017]/py were employed to search eight databases (Figure 1). The search relating to all seven areas of practice resulted in 15,304 references (Figure 1). All titles and abstracts were reviewed independently by two reviewers. After full text review again by two reviewers, 112 publications met the inclusion criteria. Included publications were then tagged for relevance to older people with eight articles identified.

Additional searches included grey literature relevant to older people and publications identified from hand searching. From this, 55 documents from grey literature and six articles from hand searching were identified and included in the review. This resulted in 69 pieces of literature included after full text screening (Figure 1). A data extraction form was designed and where appropriate, literature was independently critically appraised by two reviewers using the Crowe Critical Appraisal tool (CCAT) (Crowe, 2013).

2.2.3 Review findings

As a result of the scoping review, 33 nursing QCPM related to the care of older people were identified (Supplementary file 1). A previous initiative to develop nursing QCPM for use in older person’s services was conducted in Ireland in 2014-15 (Health Service Executive, 2015). The scoping review conducted then in 2014 also found a paucity of nursing QCPM related to this field of nursing in the empirical literature. The suite of nursing QCPM for Older Persons Services developed in 2015 were included with the process metrics found in the current scoping review. Hence 20 were new metrics and 13 were the existing metrics extracted from the 2015 project Standard Operating Procedure for Older Persons Services Nursing (Health Service Executive, 2015) (Table 1).
2.2.4 Phase 2: Delphi-Consensus

Once the metrics had been identified from the literature, a modified Delphi-consensus technique was used to build expert consensus to finalise the suite of nursing QCPM and QCPI. This was to facilitate nurses working in Older Persons Services nationally to select which metrics and indicators they felt were most relevant to their professional clinical practice.

The Delphi technique has been defined as “a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem” (Linstone & Turoff, 1975, p.3). The Delphi technique includes engaging expert opinions and gathering their feedback to reach consensus (Hanafin, 2004). A classical Delphi technique consists of the following features: anonymity, controlled feedback, iteration, statistical group response and stability (Van Zolingen & Klaassen, 2003).

The Delphi-consensus technique included four electronic survey rounds of nurses and was modified by the addition of a face to face consensus meeting at the end of the fourth survey round. The first two rounds of the survey focused on prioritising metrics derived from the literature review and also for participants to suggest other potential metrics. Once these were agreed, survey rounds three and four focused on prioritising and identifying indicator statements for these metrics. Following this, a single consensus meeting was held with key stakeholders to discuss and vote on the prioritised list of metrics and indicators.

2.3 Participants

For the Delphi surveys, a purposive, total population sample was used. The target population were nurses working in Older Persons Services (OPS) across Ireland. OPS in Ireland are configured in nine Community Healthcare Organisations (CHOs). CHOs include all services outside of the acute hospital system and comprise community mental health, primary care and...
social care services (including older person residential services). The most common unit of residential service for older people is the community nursing unit of which there are 135 nationally (Health Service Executive, 2018b).

Inclusion criteria were that participants were Registered Nurses, working in OPS as defined above and could complete the survey electronically. Sample size was calculated as 300 to be representative of a given total population using 95% confidence level and a confidence interval of five (Noordzij et al., 2010). A non-probability sampling approach was employed since opt-in sampling is known as a suitable method for online surveys as it ensures higher response rates (Blair & Blair, 2015; Fricker, 2012). 11.8% (404) OPS nurses of the total population of 3400 (Central Statistics Office, 2017) expressed interest in participating.

For the consensus meeting, 13 stakeholders were selected who were representative of the key stakeholders in the services with consideration to grade and geographical representation. These included practice development co-ordinators, directors of Nursing and Midwifery Planning and Development Units (NMPDU), NMPDU project officer leads and co-leads, steering group chairs, directors and assistant directors of nursing, clinical nurse managers, advanced nurse practitioners, clinical nurse specialists, staff nurses, one patient advocate and one international academic expert.

2.4 Data collection

In the first Delphi stage, the method used was an anonymous online survey. All four survey rounds collected participants’ demographic information (workplace, grade and years of nursing experience). Rounds one and two included the list of identified metrics. In rounds three and four, the list of metrics emerging from rounds one and two together with their indicators were distributed. Participants were asked to rate the importance of each metric or indicator between 1 and 9 on a Likert scale. 1-3 was not important, 4-6 was important but not
crucial and 7-9 was very important. In Rounds 1 and 3, participants could add their suggestions and comments for other potential metrics and indicators to be included.

A pilot study was carried out with minor amendments made to the survey tool, with the survey conducted between June - October 2017. To enable controlled feedback and iteration, responses to each round were collated, analysed and redistributed in the next round. Participants therefore had knowledge of the group results from the previous round.

Stage two was the consensus meeting held in November 2017. Attention was paid to identifying the optimum way to conduct the consensus meeting to ensure anonymity and stability, with a further review of the literature undertaken to identify good practice guidelines (Gagnier et al., 2013; McMillan, King, & Tully, 2016). An electronic voting system was used to ensure anonymity and record the outcomes of the voting process.

2.5 Ethical considerations

Ethical approval was obtained from the University Faculty Research Ethics Committee (No: 2016_12_12_EHS). This was obtained prior to the 2018 European Union General Data Protection Regulation (GDPR), but in keeping with that regulation, participation in the survey and the consensus meeting was by an ‘opt-in’ informed consent approach reflecting GDPR principles.

2.6 Data analysis

The Delphi survey data were statistically analysed using simple descriptive statistics (frequencies) to summarise data using Microsoft Excel (2016). Consensus on whether a metric or indicator was to be included, was determined where 70% or more of participants (Hsu & Sandford, 2007) scored the metric or indicator between 7-9 (very important) and less than 15% of participants scored the metric or indicator as 1-3 (not important). A similar analytical approach was used in the consensus meeting.
The free text comments from participants for Rounds 1 and 3 were included in the qualitative analysis as first order constructs (Butler, Hall, & Copnell, 2016). They were pooled into a spreadsheet, read and reviewed in detail. If a comment matched a metric or indicator that currently had a high rating, it was mapped under that metric or indicator and not included in further analysis. If there were comments supporting a metric or indicator that had not reached 70% agreement, the metric or indicator was then re-circulated in the following round. Remaining comments were counted to generate codes summarising frequently occurring metric or indicator suggestions. These codes were categorised as themes and then circulated in the next round as new metrics or indicators.

2.7 Validity and reliability

Guidelines for using and reporting Delphi studies (Boulkedid, Abdoul, Loustau, Sibony, & Alberti, 2011) framed validity and reliability. Consideration was given to the composition of the panel in both the survey rounds and the meeting to ensure heterogeneous composition with wide geographic spread. The survey items were derived from a systematically conducted review of the literature and also offered participants the opportunity to contribute.

The survey rounds used Likert scales with a consistent cut-off point of 70%. Participants had feedback from the previous survey round of their own and the group response. It was recognised that offering a consensus meeting might affect the process through dominant individuals and their particular viewpoint (Boulkedid et al., 2011). Therefore, as Boulkedid et al. (2011) recommend, the meeting was well structured, moderated with conduct guidelines prepared and agreed. Voting was anonymous and for consistency the 70% cut-off point used in the survey rounds was also used in the consensus meeting. A framework developed to aid participants in evaluating each individual metric and indicator before voting. The framework consisted of four domains; ‘Process Focused’; ‘Important’; ‘Operational’ and ‘Feasible’ (Supplementary file 2) (Murphy et al., 2019, in press).
3. RESULTS

404 nurses working in Older Persons’ Services agreed to participate with between 219 - 181 participating in each survey round. Most participants were graded at Clinical Nurse Manager 2 level with an average of 23 years of nursing experience ranging between 2-47 years. Participants represented all four regions of the country (Table 2).

3.1 Survey rounds 1 and 2

Survey rounds 1 and 2 were to allow participants to prioritise metrics. Round 1 had an overall response rate of 53.71% (N=217). Nurses responding to the first round were invited to complete round 2 with a response rate of 85.71% (N=186). At the end of Round 1, 21 of the 33 metrics identified from the scoping review went through to Round 2 of the survey (Table 3).

In round 1, participants were given the opportunity to add suggestions for new areas of practice to be included as potential new metrics in the next round of the survey. The 200 comments were analysed, categorised under 17 common themes and mapped to either an existing metric or included as a new metric.

In Round 1, 12 of the 33 metrics were not rated between 7 and 9 by 70% or more thus they were initially excluded. However, four of these metrics were specifically mentioned in the comments. This enabled four metrics to reach 70% (Table 3) increasing the number of metrics to 25. The ‘Patient Experience’ metric was an example of this. It was part of the existing suite of metrics (Health Service Executive, 2015) and included aspects such as patient satisfaction with privacy, hygiene, receiving information and support, pain management, discharge planning and other care related processes. After Round 1, it did not
meet the 70% threshold, but after analysis of the free text comments it reached the threshold and was therefore included in Round 2.

Other comments that did not match with the metrics already rated in Round 1 were mapped under 17 newly generated codes summarising frequently occurring comments. The most frequently repeated metric suggestions were then categorised into four themes, edited and included as new metrics in Round 2 (Table 3). Thus, on completion of Round 1 of the Delphi survey, the total number of metrics presented for Round 2 was 29.

At the end of Round 2, 26 of the 29 metrics were rated at 70% and over and were therefore included. After discussions by the project steering group, these 26 metrics were re-formulated into 20 metric statements (Supplementary file 3). Part of the role of the national project steering group was to ensure that metrics were useful to residential settings and did not overlap or measure the same construct more than once. If in the opinion of the steering group there was overlap, the metrics were then merged under a single heading.

However, 13 of these 20 metrics required indicator development as there was little or no supporting literature. The national project steering group were tasked to draw on clinical expertise nationally to derive indicators for these metrics. The group members based on their expertise, were allocated to teams consisting of at least two members. Each team were responsible for deriving indicators for one to three metrics. The members consulted with the managerial and clinical staff in their area and identified national and local policies, procedures and clinical guidelines currently used in their practice areas to develop indicators. 95 indicators were then collated, reviewed and presented for the third round of the Delphi survey.
3.2 Survey rounds 3 and 4

404 nurses were initially recruited, however 17 withdrew in the first two rounds. 387 nurses were sent invitations for round 3 with an overall response rate of 56.58% (N=219). Respondents of round 3 were then invited to round 4 with a response rate of 82.64% (N=181).

The set of 20 metrics now with 95 indicators were presented to the participants in Round 3. 92 of the 95 indicators relevant to the 20 metrics achieved the 70% threshold with none of these indicators being rated between 1 and 3 by more than 15% of the participants. These indicators were therefore included. The excluded indicators related to the continence assessment, promotion and management metric.

As in Round 1, survey participants could add their suggestions for additional indicators. In Round 3, 71 comments were received and following analysis of these comments, the indicators were further reviewed, refined, collapsed or separated where necessary by the national project steering group. Following this, the final number of indicators presented in Round 4 was 90.

In round 4, using the analysis rule as before, all 90 indicators were rated between 7 and 9 (very important) by all participants. None of the indicators were rated between 1 and 3 (not important) by more than 15% of the participants. No indicators were excluded following round 4. The final result after the four rounds of the Delphi survey was the identification of 20 metrics and 90 associated indicators. Each indicator was then rigorously appraised in a pre-consensus meeting by the national project steering group with particular reference to relevance and wording. As some indicator statements were composites, these were separated into two or more indicator statements. Further to this, the number of indicators was slightly increased from 90 to 94 (Supplementary file 4).
3.3 Consensus meeting results

The purpose of this face to face meeting was to facilitate robust discussion by the consensus group members of the 20 metrics and 94 indicators. In the meeting, every metric and every indicator was discussed and voted on. The discussions were centred on the four elements of the framework in evaluating the metrics and indicators. While the first two domains of the framework (Process focused and Important) were readily agreed for most metrics/indicators, domain three (Operational) and four (Feasible) generated much discussion. The discussions centred on how to measure, for example, what tools/frameworks were acceptable in delivering care and timelines, such as whether three or four-monthly reviews required. This was particularly true of the elements of care where guidance from national regulators was non-specific as care practices varied from one setting to another. Consensus was achieved by discussion followed by majority vote (Supplementary file 5).

Some metrics provoked considerable discussion, for example “Mobility, Dexterity and Rehabilitation”. Arguments were proposed and debated for the inclusion or exclusion of this metric. However, it failed to reach the 70% threshold to be included in the final suite as only 4 of the 11 members present at the time voted for it. In total, 19 of the 20 metrics and 80 of the 94 associated indicators reached the 70% threshold required and thus were included in the final suite of nursing QCPM and QCPI for Older Persons Services (Figure 2).

4. DISCUSSION

In this study, a national suite of 19 nursing QCPM with 80 associated QCPI for nurses caring for older people in older persons care settings was developed. This was in response to a need to develop, refine and standardise nursing process measures as a strategy to improve nursing care quality (Heslop & Lu, 2014). Using metrics and indicators in practice can provide strong signals about where quality improvement is needed, acting as a stimulus to target efforts to
improve care. It is acknowledged that the development of measures reflecting the complexity of nursing is challenging and there must be evidence that changes in the measure reflect or are sensitive to a primary contribution by nurses (Griffiths et al., 2008). Such measures may then legitimately be described as nurse-sensitive indicators and can be used to identify both the structure and processes of care that influence patient outcomes which are distinct and specific to nursing (Montalvo, 2007). In this study it was considered critical that the nurse QCPM and QCPI developed would reflect optimal professional practice standards and guidelines in the care of older people. They needed to be effective for monitoring and evaluating aspects of care for which nurses have key responsibility. The use of the Delphi technique enabled nurses working in Older Persons Services to articulate areas of their professional clinical practice that they felt were important in the nursing care of older people.

The final suite of metrics identified closely resembles aspects of the fundamentals of care described by Kitson, Conroy, Wengstrom, Profetto- McGrath and Robertson- Malt (2010). Kitson et al. identified 14 aspects of fundamental care and these have formed the basis of a body of work around refining and further conceptualisation into a framework and point-of-care nursing theory (Kitson, 2018). Feo et al. (2018) in a scoping review explored the main ways the fundamentals of care are defined in the literature. They point to a dichotomy between the fundamentals of care conceptualised as a list of nursing activities or alternatively as a ‘complex, multidimensional construct that emphasises nursing tasks; the need to develop trusting, positive relationships with patients; and the care context’ (Feo et al., 2018, p. 2225). Feo et al. (2018) further distinguished between fundamentals of care and compassionate care with the latter having greater emphasis on values, attitudes and behaviours of nurses. The metrics and indicators identified in this study fall into the first category as a list of nursing activities. An apparent absence of aspects of compassionate care and the more complex conceptualisation of fundamentals of care is partly explained by the requirement that the
metrics and indicator statements need to be concise and precise to facilitate measurement. As these measures are intended for use nationally across many older person care settings, the need for reliability of measurement across different settings dictated that they are not open to differing interpretation.

The steps taken to identify the metrics and indicators in this study were consistent with steps suggested for the development of nursing sensitive indicators (National Database of Nursing Quality Indicators, 2018). The design of this study, including the scoping review of the literature, Delphi surveys and consensus meeting of the nursing experts, were compatible with this development process. However, the types of evidence found to underpin these metrics and indicators was interesting. It is recognised that there are different forms of evidence including research evidence, practice evidence and patient evidence (Kötter, Schaefer, Scherer, & Blozik, 2013). However, metrics and indicators for healthcare should aim to be underpinned by higher order research evidence such as from randomised controlled trials and meta-analyses (Campbell et al., 2011; Maben et al., 2012). The metrics and indicators forwarded through the Delphi rounds were mostly derived from practice evidence since there was insufficient research evidence in the literature related to nursing in older persons care settings. The areas of nursing practice identified are similar to the fundamentals of care (Kitson et al., 2010) which are also poorly defined and lack conceptual clarity (Feo et al., 2018). In addition, the lack of clear operational definitions for QCPM, QCPI and fundamentals of care, may partly explain the apparent lack of underpinning high-quality empirical evidence. Not all of the metrics and indicators identified either through the literature review or the consensus process had reference standards and a research evidence base although they had a strong practice evidence base. The grey literature was very useful in identifying important practice areas, of concern to practitioners and regulators in the Irish context. Within this however, there was considerable variation ranging from full guidelines.
with underpinning evidence through to checklists with no supporting evidence base. The remaining non-grey literature as identified earlier, included papers that would have one or sometimes two but not all of the defining attributes of a metric. The grey and non-grey literature successfully identified practice evidence, but there was little higher-level research evidence supporting the identified metrics. As they were closely linked to the fundamentals of care around which there is a lack of high-quality research evidence (Muntlin Athlin, 2018; Richards et al., 2018), this is unsurprising. Similarly, there was little patient and public evidence to further support which areas of practice might be considered relevant. Likewise, input from allied health professionals, medical practitioners, families and carers is also of importance. It is strongly recommended that the evidence base is continually reviewed and strengthened and that metrics and indicators are tested with further evaluation undertaken to avoid unintended and adverse consequences (Campbell et al., 2011).

### 4.1. Limitations

The study aimed to be inclusive by inviting all nurses working in Older Persons Services nationally to participate. However, only around 6% of the total Older Persons Services nurse population in Ireland participated in the various survey rounds. This was partly the result of some nurses working in these services not having access to work email and partly the result of non-participation. Additionally, there was some attrition in the sample achieved between survey rounds 1 and 2 and between rounds 3 and 4. It is possible therefore, that the overall sample is not representative of the underlying population and that there may be a response bias arising from those deciding to participate in the study.
5. CONCLUSION

In this study, we describe the development of a suite of nursing QCPM and associated QCPI for future implementation in Older Persons Services (OPS) in Ireland. The 19 nursing QCPM and 80 QCPI when implemented in clinical practice can support nurses to embed the concept of measurement for improvement in their care of older people. The development of this suite of metrics and indicators incorporated the expert knowledge of nurses working in OPS, enabling them to work towards assuring and embedding safer, quality care. Further debate about what is valued by nurses, patients and other stakeholders in the care of older people is required to further recognise gerontological nursing as a distinct and valued area of nursing practice (Nursing and Midwifery Board of Ireland, 2015). The significance and influence of the nursing contribution to patient outcomes in older person care settings is under recognised. The identification of nursing QCPM and QCPI can help to support and demonstrate nurses’ contribution to patient safety.

Conflict of interest

No conflict of interest has been declared by the authors.
6. REFERENCES


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Health Information and Quality Authority. (2012, November 30). Investigation into the safety, quality and standards of services provided by the Health Service Executive to patients, including pregnant women, at risk of clinical deterioration, including those

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**Figure 1.** PRISMA Flow Diagram for the Literature Review

**Figure 2.** Final Suite of Older Persons’ Services Nursing Quality Care Process Metrics and Associated Indicators

**Table 1.** Quality Care Process Metrics identified from the literature review

**Table 2.** Demographic profile of sample for Delphi survey rounds

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**Supplementary files**

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File 2: Judgement framework guided the voting in consensus meeting

File 3: Quality Care Process Metrics re-formulated into 20 metrics statements

File 4: Quality Care Process Metrics and indicators presented to the consensus meeting

File 5: Ratings of each metric and indicator at the consensus meeting.

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**Table 1.** Nursing Quality Care Process Metrics identified from the literature review

<table>
<thead>
<tr>
<th>Existing metrics (Health Service Executive 2015)</th>
<th>New metrics identified from 2017 review</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Misuse of Drugs Act drugs</td>
<td>15. Wound care</td>
</tr>
<tr>
<td>3. Medication administration</td>
<td>16. Chemical restraints</td>
</tr>
<tr>
<td>4. Medication prescription</td>
<td>17. Emotional support</td>
</tr>
<tr>
<td>5. Standardised needs assessment as basis for care plan</td>
<td>18. Mobility, dexterity and rehabilitation</td>
</tr>
<tr>
<td>6. Assessment and management of pressure ulcers</td>
<td>19. Oral and dental care</td>
</tr>
<tr>
<td>7. Fall risk assessment</td>
<td>20. Sensory loss (e.g. hearing or vision) is identified and managed</td>
</tr>
<tr>
<td>8. Fall prevention</td>
<td>21. Optimising nutrition and hydration</td>
</tr>
<tr>
<td>9. Invasive medical devices (e.g. indwelling urinary catheters)</td>
<td>22. Meals and mealtimes</td>
</tr>
<tr>
<td>10. Physical restraints</td>
<td>23. Tube feeding</td>
</tr>
<tr>
<td>11. Discharge planning</td>
<td>24. Infection control</td>
</tr>
<tr>
<td>12. Environment (hygiene and safety)</td>
<td>25. Safeguarding vulnerable adults</td>
</tr>
<tr>
<td></td>
<td>27. Pain assessment</td>
</tr>
<tr>
<td></td>
<td>28. Pain management</td>
</tr>
<tr>
<td></td>
<td>29. Continence assessment, promotion and management</td>
</tr>
<tr>
<td></td>
<td>30. End of life and palliative care</td>
</tr>
<tr>
<td></td>
<td>31. Delirium screening, prevention and management</td>
</tr>
<tr>
<td></td>
<td>32. Depression screening, prevention and management</td>
</tr>
<tr>
<td></td>
<td>33. Responsive (challenging) behaviours</td>
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Table 2. Demographic profile of sample for Delphi survey rounds

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Round 1 n=217</th>
<th>Round 2 n=186</th>
<th>Round 3 n=219</th>
<th>Round 4 n=181</th>
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<tr>
<td>Grade</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Staff Nurse</td>
<td>49 (23.4)</td>
<td>27 (14.5)</td>
<td>42 (19.1)</td>
<td>27 (14.9)</td>
</tr>
<tr>
<td>*CNM1</td>
<td>14 (6.4)</td>
<td>11 (5.9)</td>
<td>15 (6.8)</td>
<td>10 (5.5)</td>
</tr>
<tr>
<td>*CNM2</td>
<td>47 (21.6)</td>
<td>54 (29)</td>
<td>49 (22.3)</td>
<td>41 (22.6)</td>
</tr>
<tr>
<td>*CNM3</td>
<td>3 (1.3)</td>
<td>4 (2.1)</td>
<td>3 (1.3)</td>
<td>4 (2.2)</td>
</tr>
<tr>
<td>*CNS</td>
<td>11 (5)</td>
<td>12 (6.4)</td>
<td>15 (6.8)</td>
<td>17 (9.3)</td>
</tr>
<tr>
<td>Director of Nursing</td>
<td>28 (12.9)</td>
<td>23 (12.3)</td>
<td>26 (11.8)</td>
<td>23 (12.7)</td>
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<tr>
<td>Assistant Director of Nursing</td>
<td>32 (14.7)</td>
<td>36 (19.3)</td>
<td>34 (15.5)</td>
<td>34 (18.7)</td>
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<tr>
<td>Educator</td>
<td>3 (1.3)</td>
<td>2 (1)</td>
<td>6 (2.7)</td>
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<td>**Other</td>
<td>22 (10.1)</td>
<td>12 (6.4)</td>
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<tr>
<td>Not specified</td>
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<table>
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<tr>
<th>#Average years of experience</th>
<th>n=96</th>
<th>n=98</th>
<th>n=96</th>
<th>n=95</th>
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<tr>
<td>Range</td>
<td>23.3</td>
<td>24.9</td>
<td>23.2</td>
<td>23.7</td>
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<table>
<thead>
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<th>#Health Service Regions</th>
<th>n=154</th>
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<th>n=99</th>
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<tr>
<td>Region 1</td>
<td>7 (4.54)</td>
<td>4 (3.30)</td>
<td>7 (5.30)</td>
<td>6 (6.06)</td>
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<tr>
<td>Region 2</td>
<td>41 (26.62)</td>
<td>41 (33.88)</td>
<td>36 (27.27)</td>
<td>32 (32.32)</td>
</tr>
<tr>
<td>Region 3</td>
<td>49 (31.81)</td>
<td>37 (30.57)</td>
<td>39 (29.54)</td>
<td>22 (22.22)</td>
</tr>
<tr>
<td>Region 4</td>
<td>57 (37.01)</td>
<td>39 (32.23)</td>
<td>50 (37.87)</td>
<td>39 (39.39)</td>
</tr>
</tbody>
</table>

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*CNM1= Clinical Nurse Manager 1, CNM2= Clinical Nurse Manager 2, CNM3= Clinical Nurse Manager 3, CNS= Clinical Nurse Specialist.

**Other= Advanced Nurse Practitioner, Senior staff nurse, Practice development facilitator, Quality and Patient Safety Manager, Acting CNM1, Practice development nurse, Nursing Midwifery Planning Development Unit Officer at Assistant Director of Nursing grade, Nursing Midwifery Planning Development Unit Officer, Project officer, A/Clinical Development Co-ordinator, Practice facilitator, Clinical practice support nurse, CNM2 Quality and Patient Safety Manager, Policy development/nurse facilitator (as reported by the participants).

# The figures indicate those participants who provided information on years of experience and which region they worked in.

Table 3. Comparison of results of Quality Care Process Metrics from rounds 1 and 2

<table>
<thead>
<tr>
<th>Metric</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication administration</td>
<td>95.55</td>
<td>98.84</td>
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<tr>
<td>Safeguarding vulnerable adults</td>
<td>94.06</td>
<td>94.74</td>
</tr>
<tr>
<td>Pain management</td>
<td>93.57</td>
<td>97.66</td>
</tr>
<tr>
<td>End of life and palliative care</td>
<td>93.07</td>
<td>97.67</td>
</tr>
<tr>
<td>Assessment and management of pressure ulcers</td>
<td>93.07</td>
<td>98.25</td>
</tr>
<tr>
<td>MDA Drugs</td>
<td>92.08</td>
<td>94.77</td>
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<tr>
<td>Fall risk assessment</td>
<td>91.59</td>
<td>95.35</td>
</tr>
<tr>
<td>Pain assessment</td>
<td>90.10</td>
<td>96.49</td>
</tr>
<tr>
<td>Fall prevention</td>
<td>88.62</td>
<td>95.35</td>
</tr>
<tr>
<td>Medication prescriptions</td>
<td>88.62</td>
<td>89.53</td>
</tr>
<tr>
<td>Infection control</td>
<td>88.61</td>
<td>91.86</td>
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<tr>
<td>Wound care</td>
<td>88.12</td>
<td>91.86</td>
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<td>Medication storage and custody</td>
<td>87.63</td>
<td>92.45</td>
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<tr>
<td>Privacy and dignity</td>
<td>84.66</td>
<td>89.48</td>
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<tr>
<td>Optimizing nutrition and hydration</td>
<td>84.16</td>
<td>93.02</td>
</tr>
<tr>
<td>Chemical restraints</td>
<td>81.68</td>
<td>84.30</td>
</tr>
<tr>
<td>Responsive (challenging) behaviours support</td>
<td>80.09</td>
<td>86.55</td>
</tr>
<tr>
<td>Physical restraints</td>
<td>79.70</td>
<td>80.81</td>
</tr>
<tr>
<td>Metric</td>
<td>Average Rating</td>
<td>Percentile</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------</td>
</tr>
<tr>
<td>Standardised needs assessment as basis for care plan</td>
<td>75.74</td>
<td>82.56</td>
</tr>
<tr>
<td>Continence assessment, promotion and management</td>
<td>74.25</td>
<td>84.21</td>
</tr>
<tr>
<td>Invasive medical devices (e.g. indwelling urinary catheters)</td>
<td>70.80</td>
<td>77.33</td>
</tr>
<tr>
<td><strong>Metrics that made it through after analysis of qualitative comments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient experience</td>
<td>70.00</td>
<td>76.75</td>
</tr>
<tr>
<td>Environment (hygiene and safety)</td>
<td>70.00</td>
<td>72.09</td>
</tr>
<tr>
<td>Cognitive assessment</td>
<td>70.00</td>
<td>72.68</td>
</tr>
<tr>
<td>Mobility, dexterity and rehabilitation</td>
<td>70.00</td>
<td>76.02</td>
</tr>
<tr>
<td><strong>Additional metrics identified from qualitative comments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities (physical, social, recreational and sensory)</td>
<td>Not available</td>
<td>58.24</td>
</tr>
<tr>
<td>Social/engagement (family centred/included, social engagement and support)</td>
<td>Not available</td>
<td>57.65</td>
</tr>
<tr>
<td>Person centred care (individual plan/assessment, self-care, self-management, decision making)</td>
<td>Not available</td>
<td>83.53</td>
</tr>
<tr>
<td>Health Screening (Sensory, Depression and Delirium)</td>
<td>Not available</td>
<td>69.99</td>
</tr>
</tbody>
</table>

*Rated by 70% and above*
Figure 1: PRISMA Flow Diagram for the Literature Review (Adapted from: Moher et al., 2015)
<table>
<thead>
<tr>
<th>Metric statement</th>
<th>Indicator statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comprehensive geriatric assessment</strong></td>
<td>• On admission, there is evidence of a full physical assessment of the individual. • Four monthly regular reviews. • On admission, there is evidence of a full assessment of activities of daily living. • Four monthly regular reviews. • On admission, there is evidence of a full psychological (cognition, mood, delirium) assessment of the individual. • Four monthly regular reviews. • On admission, there is evidence of a full social assessment of the individual. • Four monthly regular reviews. • Evidence of frailty assessment. • Four monthly regular reviews.</td>
</tr>
<tr>
<td><strong>Person centred care planning</strong></td>
<td>• After a comprehensive assessment, appropriate interventions including record of specialist referral. • Involve in decisions made about his/her care by the individual. • Individual is supported to care for him/herself. • Provision of intimate personal care is planned in accordance with individual wishes. • The individual’s preferences and choices are documented.</td>
</tr>
<tr>
<td><strong>Falls risk</strong></td>
<td>• A falls risk assessment is completed on all individuals within 24 hours of admission. • Individuals are reassessed at least every 4 months or sooner if indicated (e.g. following a change in status or a fall). • There is evidence of a documented falls risk assessment and reassessment before any form of restraint is considered.</td>
</tr>
<tr>
<td><strong>Fall prevention</strong></td>
<td>• A care plan has been initiated for all individuals identified as medium or high risk of falls. • A falls prevention programme is in place in the organization. • All staff have received education on falls prevention. • Where the individual has fallen, they have been reviewed using the BIBAn analysis format.</td>
</tr>
<tr>
<td><strong>Optimizing nutrition and hydration</strong></td>
<td>• Nutritional screening undertaken on admission. • Four monthly regular reviews. • There is a completed nutritional care plan for individuals identified as moderate to high risk. • The individual has access to fluid and varied dietary options. • The diet provided is suited to the assessed needs of the individual. • An oral cavity assessment is completed on admission. • Four monthly reviews of oral cavity.</td>
</tr>
<tr>
<td><strong>Assessment and management of pressure ulcers</strong></td>
<td>• A Pressure ulcer risk assessment is conducted on admission and transfer. • If pressure ulcer is present, the grade is documented. • Pressure ulcer risk is re-assessed as required. • For all risk individuals, commencement on B:U:LN bundles for pressure ulcer prevention &amp; management are evident. • Pressure reducing devices and alternative pressure therapies are used if indicated in risk assessment.</td>
</tr>
<tr>
<td><strong>Continence assessment, promotion and management</strong></td>
<td>• A continence assessment is conducted on admission, transfer and discharge. • Four monthly regular reviews or more frequently. • A continence promotion care plan is in place by continuity assessment.</td>
</tr>
<tr>
<td><strong>Pain assessment and management</strong></td>
<td>• On admission an appropriate pain assessment tool is completed. • Individual’s pain is measured. • A pain management care plan including pharmacological and non-pharmacological interventions is evident.</td>
</tr>
<tr>
<td>Activities (physical, social, recreational and sensory) Social/engagement (family-centred/included, social engagement and support)</td>
<td>• The individual’s interests and hobbies are documented in a social activity plan. • Four monthly reviews of the social activity plan. • The care plan demonstrates evidence of the individual’s involvement in the development of their social activity plan. • There is evidence of individual’s participation in the social activity plan.</td>
</tr>
</tbody>
</table>

Figure 2. Final Suite of Older Persons Services Nursing Quality Care Process Metrics and Associated Indicators
<table>
<thead>
<tr>
<th>Metric statement</th>
<th>Indicator statements</th>
</tr>
</thead>
</table>
| Skin Integrity                         | • Skin care assessment on admission, transfer and discharge is completed.  
• Modifiable risk factors associated with impaired skin integrity e.g. incontinence,  
  pressure ulcer, mobility are identified and managed                                |
| Medicines administration               | • The medicines administration record provides details of individual's legible name, unique identifier.  
• The Allergy Status is clearly identifiable on the front page of the prescription  
  sheet and/or medication administration record.  
• All prescribed medications are administered or have an omission code entered and  
  appropriate action taken.  
• There are no unassessed prescribed medicinal products in the individual's  
  environment.  
• The Frequency of Medicines Administration is as prescribed. |
| Medicines prescribing                  | • There is evidence of medicines reconciliation on admission, transfer or discharge.  
• There is evidence of 3 monthly review of medicines.  
• The complete prescription is legible with correct use of abbreviations.  
• The minimum dose interval and/or 24 hour maximum dose is specified for all  
  FEN medicines.  
• Discontinued medicines are crossed off, dated and signed by person with  
  prescriptive authority.  
• The Generic name is used for each medicine unless the prescriber indicates a  
  branded medicine and states 'do not substitute'. |
| Misuse of Drug Acts Medicines          | • MDA Medicines are checked & signed at each changeover of shifts by nursing  
  staff (fly number and Day shift & Night shift).  
• Two signatures are entered in the MDA Medicines Register for each  
  administration of an MDA Medicines.  
• The MDA Medicines onboard is locked.  
• A designated nurse holds MDA keys, reports from other medication keys. |
| Medicine storage and custody           | • A registered nurse who is in possession of the keys for Medicinal Product Storage.  
• All medicinal products are stored in a locked cupboard and trolleys are  
  locked and secured as per local policy.  
• An up-to-date medicines formulary resources is available and accessible. |
| Responsive behaviour support           | • An assessment of responsive behaviours is carried out upon admission. If evidence of  
  responsive behaviours is identified an assessment has been completed.  
• Four monthly review.  
• A responsive care plan is in place.  
• FEN psychotropic medication is evidenced to be given as a last resort only after review  
  has taken place and employment of non-pharmaceutical interventions prior to  
  administration of FEN medication.  
• A member of the FEN Psychotropic Medication administered is untasted. |
| Safeguarding vulnerable adults         | • Safeguarding vulnerable adults procedures are well publicised, easy to access and  
  at an appropriate level to promote understanding.  
• Easily accessible information is available to the older person on their rights  
  advocacy. |
| End of life and palliative care        | • Individual’s end-of-life care preferences are identified and documented.  
• A holistic palliative care plan including spiritual needs and symptom management  
  is evident and updated accordingly.  
• The individual’s resuscitation status is clearly documented. |
| Infection control                      | • All invasive medical devices are managed in accordance with local policy / Care  
  bundle.  
• Infection and sepsis alert status are recorded in the nursing record. |
| Person experience                      | • Current delivery of care against identified needs is evident.  
• What is important to the individual is known and documented in care plan.  
• Person states there is opportunity for privacy.  
• Individual reports timely response to their care needs.  
• A process is in place to capture peoples experiences of its services. |

Figure 2. Final Suite of Older Persons Services Nursing Quality Care Process Metrics and Associated Indicators (continued)