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Systematic review: 'missed care' and the impact on patient safety in primary, community and nursing home settings

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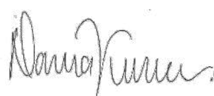
Foreword

If the stated ambition of politicians and system leaders is to have care 'delivered closer to home' – in your own local community – then those services will come under increased strain and scrutiny. The public is already well-accustomed to seeing nurses lead their care in a variety of places away from the hospital and it will rapidly become the norm as our profession advances too. The myriad of community-based nursing professionals – general practice nurses, psychiatric nurses, district nurses and those in care homes to name a few – carry out work of inestimable importance. If supported correctly, they not only deliver world-class care with similar outcomes, but enable the sensible and efficient use of all too limited resources. The inescapable truth is that every person successfully treated in primary care or their own home is one less hospital admission – or worse, re-admission – with all the associated costs and stresses for the individual and system alike.

This Systematic Review is one of the first public outputs from the University of Sheffield as part of our new Research Alliance to identify and fill gaps in the evidence base around nursing – an alliance that I believe will shape a better understanding of what is needed to deliver safer healthcare. The review shines a light on the harm done through 'missed care' in primary and community care settings. When it is hoped that more patient contacts take place in these contexts, policymakers must understand that when we talk of a staffing and resourcing crisis in the nursing profession hospitals are only part of the picture.

Personally, I spent much of my career in community nursing – health visiting and child protection – and know only too well that this work is carried out under unsustainable pressure. This paper delves further into what I saw myself. A lack of time, resources, equipment or facilities, sub-optimal communication between nurses or with other staff, and inadequate record-keeping, documentation and information systems are many of the reasons for care being 'missed'. This is rarely the fault of nursing staff themselves, and could be addressed with the right interventions from government and employers. There is no way to meaningfully address it that doesn't include significant financial investment to ensure the right numbers of staff in the right places – and with the right levels of training too. The Royal College of Nursing is campaigning for accountability for ensuring sufficient numbers of staff in health and care services to be enshrined in law in every country of the UK.

Nurses working in these specialties though also suffer from negative perceptions around the professionalism and status of care providers and the report makes clear that much more is needed to address those concerns. It is frankly unacceptable that those who serve their local communities in this way should be left demotivated or with low morale because the importance of this work is not more widely understood, nor reflected in their working conditions. Helping politicians and others to make good on their rhetoric is a top priority for the College and its partners.



Dame Professor Donna Kinnair
Chief Executive and General Secretary, Royal College of Nursing

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Executive Summary

This report follows up a previous scoping review (Sworn & Booth, July 2018) which examined the quantity, quality and design characteristics of studies that explored the relationship between nursing skill mix and safety outcomes. Following consultation, a need was identified for a systematic review that specifically analysed the relationship between the phenomenon of "missed care" and staff and patient safety outcomes.

Missed care is defined as the omission of any aspect of required patient care. Reasons for missed care are diverse and include lack of time, resources, equipment or facilities, sub-optimal communication between nurses or with other staff, and sub-optimal record-keeping, documentation and information systems. Missed care is important because, potentially, it could lead to negative patient outcomes (increased morbidity or mortality), increased resource use (through delayed discharge or re-admission) and negative perceptions of the professionalism of care providers, affecting motivation and morale.

Systematic literature searches were conducted across CINAHL and Google Scholar. Retrieved records were reviewed by a single reviewer with a sample of records being checked by a second reviewer. All cases of uncertainty, in relation to potential inclusion, were also referred to the second reviewer and inclusion resolved through consensus.

Included studies related to:

(1) Conceptualisations of missed care (n = 12)
(2) Empirical studies of missed care in a primary care, community or nursing home setting (n = 8 papers; 5 studies)
(3) Papers specifying metrics to be used when monitoring missed care (n = 7)

Compared with missed care in an acute setting, the concept is underdeveloped and underexplored within primary, community and nursing home care. Empirical studies are not common and relate to a few specific initiatives (e.g. in Australia). A large range of variables has been explored within a primary, community or nursing home care setting; adding to the standard measures used within the acute sector. The diversity of these measures likely reflects the prematurity of the concept within this particular setting. Although the evidence base is potentially useful more work is required in conceptualising and evaluating missed care in a primary, community or nursing home care setting. Qualitatively, nurses express concerns that metrics cannot capture important aspects of nursing care, such as continuity and communication between the care provider and the patient.

Introduction

This systematic review, conducted between August and October 2018, takes forward the Royal College of Nursing/University of Sheffield Strategic Research Alliance programme of work on missed nursing care and its connection to safety. A focused systematic review protocol was created following discussion of options emerging from a previous scoping review on safety and skills mix in nursing care (July 2018) and input from a stakeholder group. The scoping review (Sworn & Booth, 2018) identified a dearth of literature on skills mix and safety in relation to nursing skills mix and supplied the impetus for a more focused systematic review. The research gap surrounding missed care and community settings has also been noted by experts in the field (Bagnasco and Timmins, 2018). Preliminary findings from this report have been presented at the Royal College of Nursing on October 12th 2018.

This report has been organised according to:

(i) a synthesis of relevant theory;
(ii) a critical examination of metrics related to missed care and the implication for the contexts examined in the review
(iii) a narrative review of empirical studies relating to missed care and primary care/community care and nursing home settings
(iv) a technical appendix with details of methods and included studies.

(An "empirical study" is a research study that analyses primary or secondary data, as opposed to a commentary or review of the literature.)

The supplementary documents to which this report refers are:

- Protocol (Appendix 3)
- Data extraction forms (Available as Excel spreadsheets from the team on request)
- Quality appraisal (Appendix 4)
- Confidence in findings analysis (Table 3)

The protocol for this review was approved by School of Nursing and the Royal College of Nursing partners on 13th August 2018.

The overview of timescales can be found in the protocol in Appendix 3. This report represents work achieved according to the timetabled milestones for the period August-October 2018.

Research Questions:

Following discussion of the scoping review (July 2018), the need for further literature-based research was identified. The aims were:

- To explore concept of "missed care" as it relates to safety in primary and community care, including nursing homes.
- To build an understanding of the implications of missed care for patients, and for the system relevant for the public, politicians and policy makers.

Therefore, the review sought to address the following central research question:

- **How does 'missed care' impact on safety in primary, community and nursing home settings?**

First, the review would explore the concept of missed care by examining theoretical frameworks in the wider literature in order to judge relevancy. Second, it would examine papers that critique the metrics surrounding missed care to contextualise the issue and to understand the implications for research in primary and community care settings. Finally, the report would provide a commentary on included empirical papers within a primary and community care context; examining theoretical frameworks and metrics applied in the light of these findings.

'Missed care' theoretical models identified in the wider literature

Theoretical models were identified in order to systematically compare generic models of missed care against empirical studies identified within the specific context of interest to this review (i.e. primary, community and nursing home care). This would enable us to examine the concept of missed care and identify theories that could be adapted for appropriate use within non-acute settings.

For the purposes of this review the concept of missed care was interpreted broadly. The key concepts within missed care which were included were: missed care, unfinished care, care left undone and (implicitly) rationed care.

Table 1 - Concepts relating to Missed Care

Concept	**Definition**
Care left undone	Necessary nursing activities that were missed due to a lack of time (Ausserhofer et al, 2014)
Missed care	The omission of any aspect of required patient care (Kalisch et al, 2009a)
(Implicitly) Rationed care	Rationing that takes place at the point of service delivery where the care provider 1) withholds, withdraws, or fails to recommend a service that is in the patient's best interests; 2) acts primarily to promote the financial interests of someone other than the patient [including an organization, society at large, or the provider himself or herself]; and 3) has control over the use of the beneficial service (Adapted from Ubel and Goold, 1997).
Unfinished care	Three-pronged phenomenon consisting of a problem (resource/time scarcity), a process (clinical decision making to prioritize and ration care), and an outcome (care left undone) (Jones et al, 2015)

The preliminary mapping of the scoping review had underlined the rapidly emerging concept of “missed care” or “care left undone”. The previous scoping review noted the potential breadth of the definition of missed care e.g. missed care can include missed opportunities for communication with the patient or missed opportunities to engage in education with patients or carers. Jones et al (2015) engage with this wider context for considering the domain of patient safety in their review of missed care definitions and concepts -distinguishing between unfinished nursing care, missed care, and implicitly rationed care. They state *“Unfinished care is conceptualised as a three-pronged phenomenon consisting of a problem (resource/time scarcity), a process (clinical decision-making to prioritise and ration care), and an outcome (care left undone)”* (p1122).

Examination of theoretical models identified several relevant to missed care. In contrast to the specific focus of empirical studies, no restriction was placed on the setting for theoretical papers in order to capture more generic theories and conceptualisations of missed care which have emerged from other settings, such as acute care.

In order to identify theory, reviewers screened search results within a database and Google Scholar search (details in Appendix 2). Supplementary searches were conducted for reviews or references in empirical papers. The review team also sifted the results from the scoping review for relevant frameworks. The methods used were as follows: A full-text search of Google was conducted via the Publish or Perish^{TM} software using a published strategy and a search was conducted in the database CINAHL (search terms in appendix 2). A total of 1268 hits were retrieved from the database searches and references prioritised according to the relevance of

their titles. This facilitated a brief overview of the main conceptual models associated with missed care together with identification of graphical or tabular models where available. The section below provides an overview of identified theoretical models.

A description of relevant theoretical models for missed care

This section describes theoretical models relating to missed care. Several models relating nursing skill mix to safety were previously described in the scoping review. However, this report specifically examines the relevance of models previously identified to the phenomenon of missed care. The theoretical model identified within the scoping skills mix review that was considered most appropriate to this review was adapted by Griffiths et al (2014) from a previous version by Shamliyan et al (2009). This framework demonstrated that nurse staffing levels may be measured and analysed across multiple levels and sought to describe both costs and patient outcomes within a hospital environment. The models (listed in Table 2) are ordered in perceived relevance to community contexts.

Table 2 - Models relating to the concept of missed care

Model Identifier	**Reference**
The Missed Care Model	Kalisch et al (2009)
Causes of Missed Care	Bagnasco et al (2017)
The Patient Care Delivery Model	O'Brien-Pallas et al (2001, 2002-) community setting; O'Brien-Pallas et al (1997)
Principal Variables Model	Duffield et al (2011)
Logic Model of Nurse Staffing and Patient/Nurse Outcomes	Subirana et al (2013)
Process of Care and Outcomes Model	Lucero et al (2009-)
Missed Nursing Care Model	Tschannen et al (2010-)
Stacking Model	Patterson et al (2011)
Caseload Model	Wright et al (2015)
Conceptual Model for Patient Outcomes and Organisational Features	Ausserhofer et al (2013-)
Missed Nursing Care Theory	Castner et al (2015-)
Missed Care and Burnout: a Complexity Science Perspective	Thompson (2014)

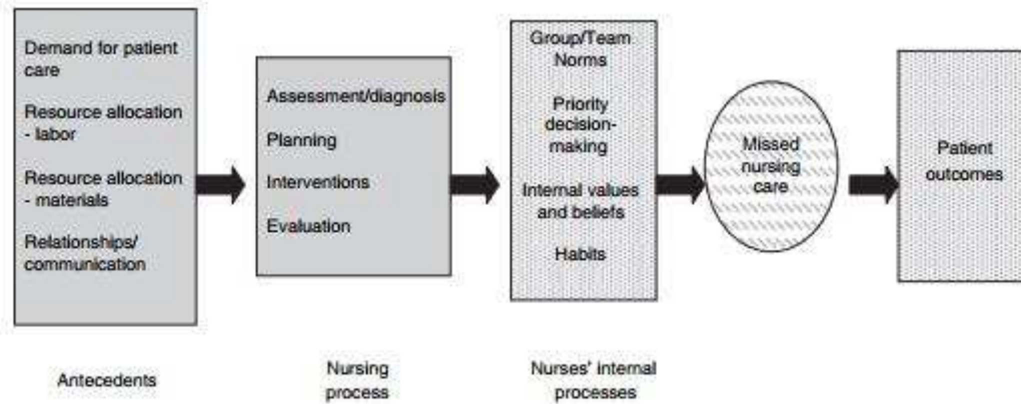
The Missed Care Model (Kalisch et al 2009)

The Missed Care Model is conceptualised as a middle range explanatory theory with universal applicability. The authors utilise a concept analysis methodology and use the quantitative MISSCARE survey tool (Kalisch 2006) to develop the model.

- Missed care is defined as an error of omission
- A model locates missed care in relation to antecedents and consequences

- Antecedents are - labour, resources, material resources, and communication and team work which interact with the nursing process and are filtered by the nurses internal processes
- *Consequences present threats to patient safety*

Figure 1 - Missed Nursing Care Model (Kalisch et al, 2009; 1512)



The model was developed in the context of acute care, and has been applied in other settings (see included studies in Table 3).

Causes of Missed Care (Bagnasco et el, 2017)

The model seeks to provide an explanation for the core conceptualisation of causes of about missed psychosocial care. This broad model has applicability to primary/community care contexts. It is a social psychology-based conceptualisation of contributory causes of missed care (organisational, social and individual dimensions containing factors such as: modelling, observational learning, social pressure, compliance, conformity and obedience). These factors are viewed as potential mechanisms causing and perpetuating missed care.

Figure 2 – Core conceptualisation of causes of missed care

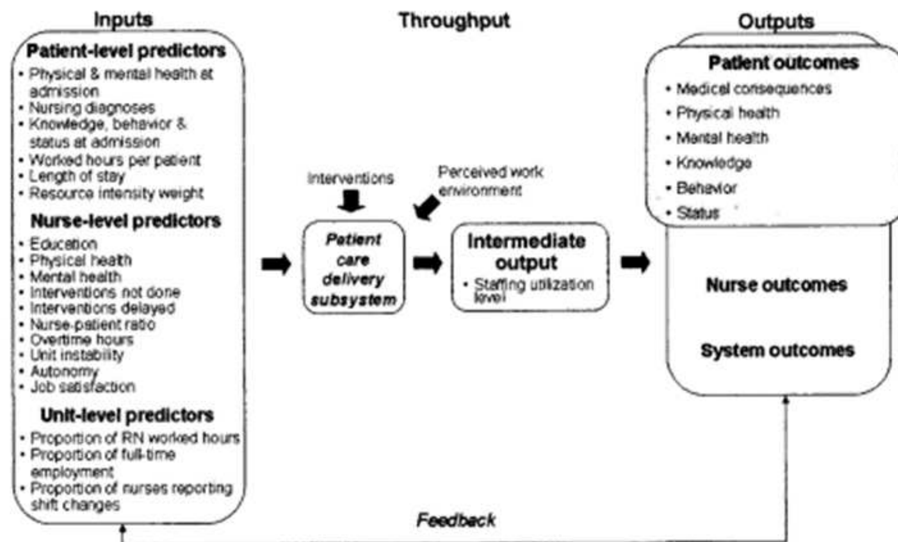
Core conceptualisation of causes of missed care.

Organisational	Social	Individual
• Cost-quality trade-off • Weak safety culture • Prioritisation of practical tasks	• Conformity • Modelling • Obedience • Compliance	• Cognitive dissonance reduction through justification, trivialisation, denial, diversion of blame • Erosion of nursing values

The Patient Care Delivery Model (O'Brien-Pallas et al (2001, 2002-community setting; O'Brien-Pallas et al 1997)

The Patient Care Delivery Model is a systems theory which explores the relationship between system, nurse and environmental factors (involves inputs, throughputs as well as outputs- tasks delayed or not done). It has been tested in acute and community contexts. The unpredictability of care needs is dealt with because the model explores the outcomes and factors known to influence variability in nursing work. Patient outcomes include medical consequences, physical health, mental health, knowledge, behaviour and status. The model below is from the acute care example, the papers reflecting community care setting (a nursing home) have adjusted the model in the following ways (model not available as graphic): inclusion of agency behaviour in Inputs (e.g. caseload, skills mix, continuity of care). Outputs include visit time. Environmental complexity factors have been added and linked to care delivery e.g. competing demands/nurse safety, unanticipated case complexity, formal information exchange, voicemail, travel, unanticipated admissions. (fig 1 p.269 O'Brien –Pallas et al 2001). However, it is worth noting that interventions not done or delayed are not included in the model in this setting. The emphasis of the community study was on average visit time and number of visits as opposed to explicitly missed care- therefore this study was not included in the empirical review.

Figure 3 - Patient Care Delivery Model (Meyer, 2009)



Principal Variables Model (Duffield et al, 2011)

Duffield and colleagues (2011) identify four types of variable relating to nurse staffing, workload, working environment, and patient outcomes, as well as identifying the data requirements that accompany each type. This offers a useful static framework but makes little attempt to depict causal relationships between variables. However, it does include a wider conceptualisation of patient outcomes by including nursing tasks delayed and nursing tasks undone (Sworn and Booth, 2018).

Figure 4 – Principal Variables Model

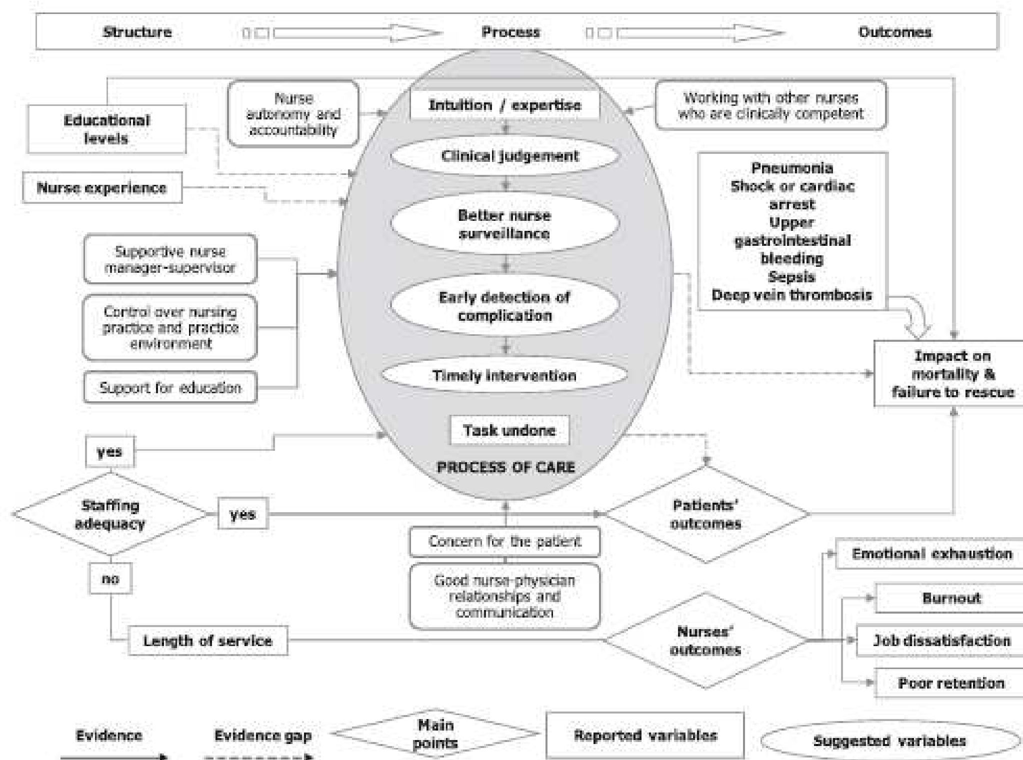
	Nurse Staffing	Nursing Workload	Working Environment	Patient Outcomes
Administrative Data	▪ Number of RN's ▪ Nursing hours worked ▪ Nursing hours per patient day ▪ Skill mix (% RN)	▪ Patient turnover (churn) ▪ Case mix (number of DRGs/ward)	▪ Rural/urban ▪ Ward type	▪ Length of stay (LOS) ▪ Failure to rescue ▪ Outcomes Potentially Sensitive to Nursing (OPSN)[a]
Primary Data Collection	▪ Percent BSN ▪ Presence of CNS ▪ Presence of nurse educator ▪ Years of experience of nursing staff ▪ Nurse overtime hours ▪ Percent nurses on permanent contracts ▪ Percent nurses that usually work on this ward ▪ Percent nurses practicing at high clinical level	▪ Patients per bed ▪ Hours of care required per patient day ▪ Nursing demand/supply - (hours of care required per patient day / nursing hours per patient day) ▪ Housekeeping support hours ▪ Amount additional time needed for patient care per shift	▪ Organizational Factors - Practice control - Nurse autonomy - RN/MD relationships - Nursing leadership - Resource adequacy ▪ Environmental complexity ▪ Perceptions of violence ▪ Job satisfaction ▪ Number patients waiting for care facility ▪ Number planned admissions ▪ Clinical pathways ▪ Clinical/technical assistance on ward (PT, OT, etc)	▪ Falls ▪ Medication errors ▪ Nursing tasks delayed ▪ Nursing tasks undone

[a] UTI; Decubitus; Pneumonia; DVT/PE; GI bleed; CNS complications; Sepsis; Shock/cardiac arrest; Surgical wound infection; Pulmonary failure; Physiological/metabolic derangement (Needleman, et al., 2001).

Logic Model of Nurse Staffing and Patient/Nurse Outcomes (Subirana et al, 2013)

Recent application of methodologies for exploring causative links, grounded in realist logic, have been used to explore the relationship between nurse staffing and patient nurse outcomes, including safety (Subirana et al, 2013). This model particularly makes explicit mechanisms otherwise implicit in more structural interpretations of causality. The realist approach recognises the role of increased surveillance and more timely intervention when adequate staffing levels and expertise are maintained (interpretation from Sworn and Booth, 2018). This model holds relevance for missed care (which includes delayed care) through the use of concepts tasks undone, timely intervention, early detection of complication and surveillance. Causal factors are explored such as staffing adequacy, environmental and communication factors (such as managerial support or good nurse physician relationships).

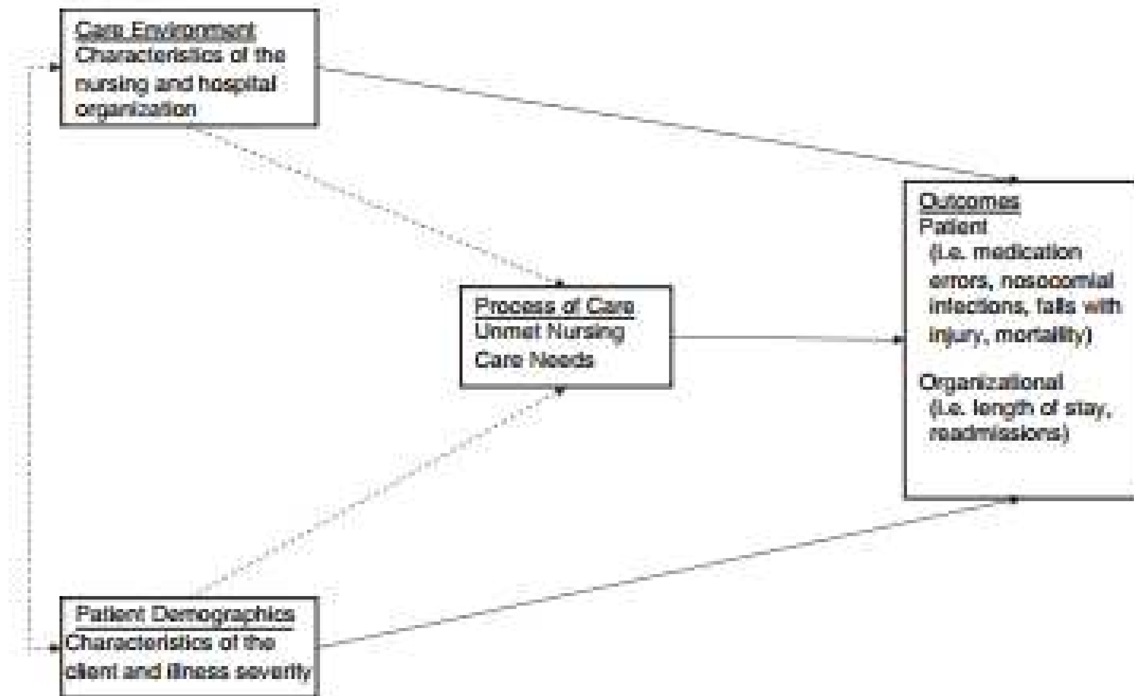
Figure 5 - Logic Model of Nurse Staffing and Patient/Nurse Outcomes (Subirana et al, 2013)



Process of Care and Outcomes Model (Lucero et al 2009-)

Unfinished care was identified as a component of the care process juxtaposed between organizational system structures and outcomes in eight models by Jones et al (2015) review (Ausserhofer et al., 2013, 2014; Castner et al., 2014; El-Jardali and Lagace´, 2005; Kalisch et al., 2009a; Lucero et al., 2009; Schubert et al., 2007; Tschannen et al., 2010 cited p.1128) The conceptual framework that guided the Lucero et al 2009 study, the Process of Care and Outcomes Model (Figure 6), has origins in Donabedian's (1966) quality paradigm. While Donabedian emphasizes a linear relationship between doing things right (i.e. processes) and having the right things happen (i.e. outcomes), in this study the authors explored the quality of nursing care by examining necessary 'things' left undone by nurses. The study was informed further by the Quality Health Outcomes Model (QHOM) (Mitchell et al. 1998). The model posits a temporal relationship among the care environment, patient factors, the process of care, and outcomes (p.2301).

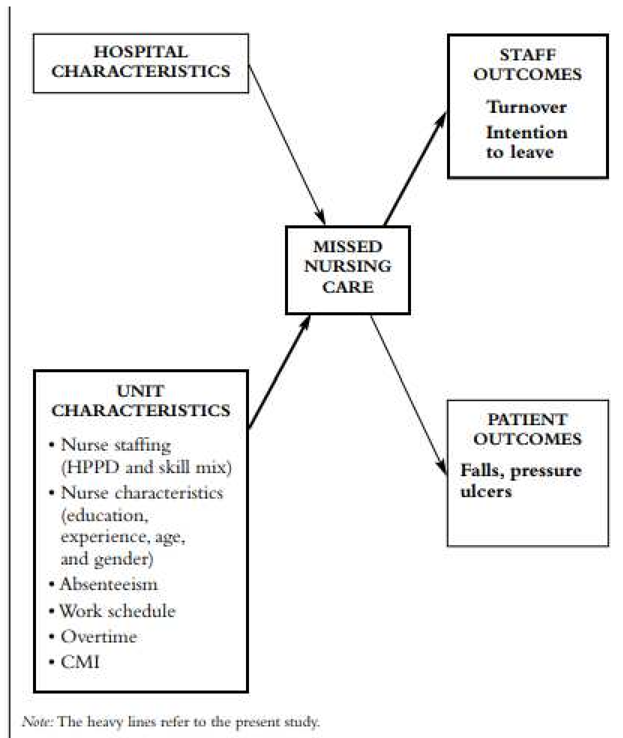
Figure 6 – Process of Care and Outcomes Model (Lucero et al, 2009; p. 2300)



Missed Nursing Care Model (Tschannen et al 2010-)

This framework is based on structure, process, and outcome (Donabedian, 1988). The study focused on the relationship between missed nursing care and the staff outcomes of turnover and intention to leave, however, this model is hospital – focused.

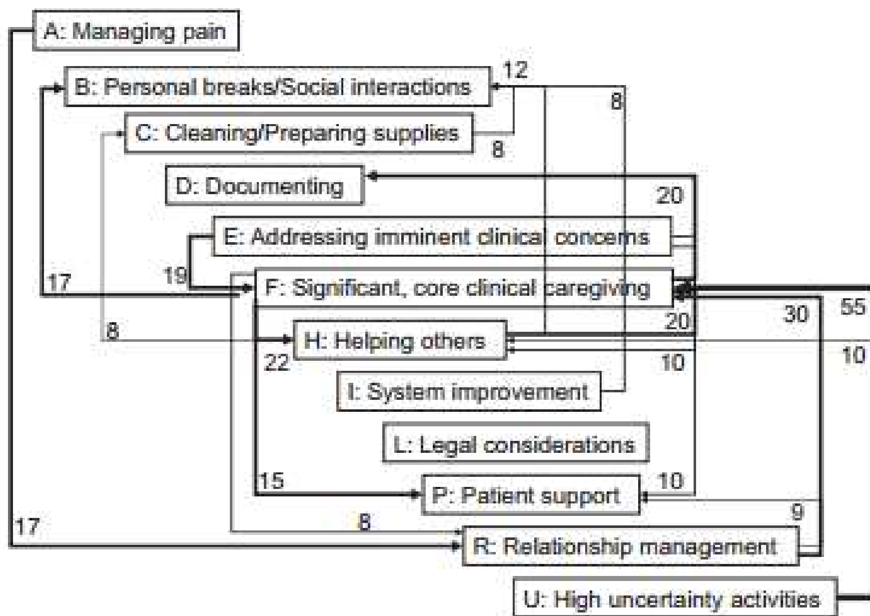
Figure 7 - Missed Nursing Care Model (Tschannen et al, 2010; p. 25)



Stacking Model (Patterson et al 2011)

The theory is a conceptualisation of prioritisation of nursing tasks in real time called 'stacking'. The model presented from the study is a 'summary of prioritisation relationships'. The model explores how nurses planned their activities and made adjustments according to unexpected events. The model asks what do nurses do when they cannot do two tasks simultaneously. Therefore, the delay of tasks has relevancy to missed care. It is based on the concept of re-planning a macro cognitive work system (that is, a system where people use advanced technology to collaborate). Authors purpose a normative hierarchy of priorities and suggest re-design of some hospital environments. However, they do not suggest rigid application of the model.

Figure 8 – Stacking Model (showing summary of prioritization relationships)

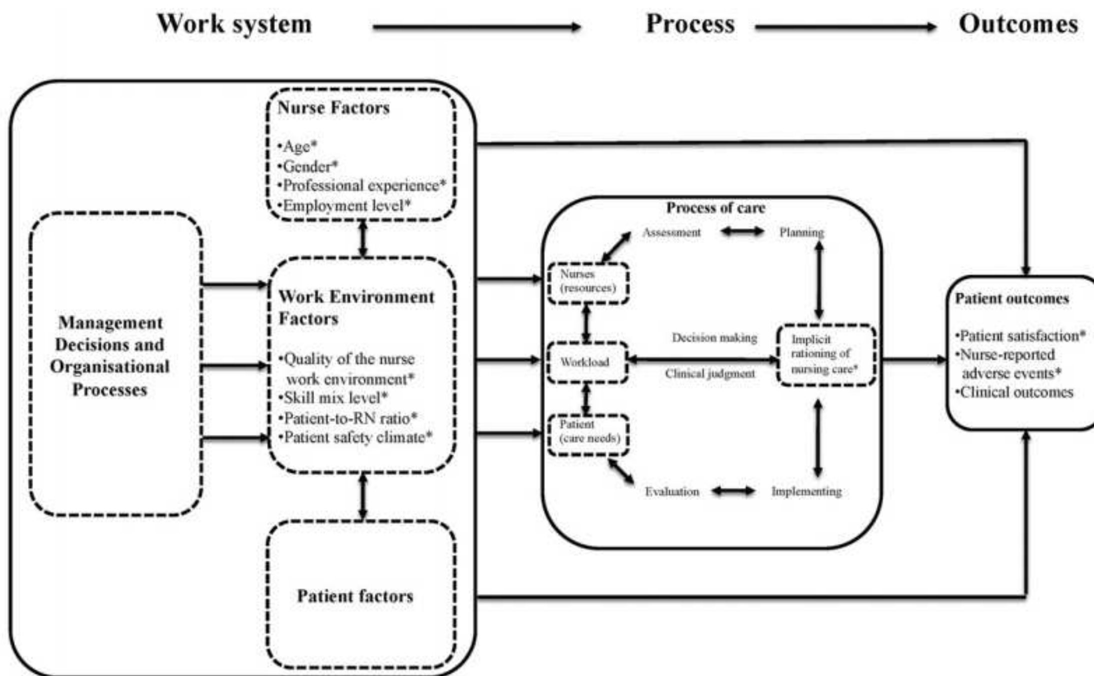


Caseload Model (Wright et al, 2015)

This paper provides an adaptation of The Cassandra Matrix © tool. The is a caseload model for community and district nursing (UK) to reflect the complexity of this setting. However, this is quite a narrow model for improving caseload management through IT. Pressures on district and community nursing teams are described as: heavy caseloads, poor/inappropriate referrals, an inability to state when capacity has been reached (p.2).

Conceptual Model for Patient Outcomes and Organisational Features (Ausserhofer et al, 2013-)

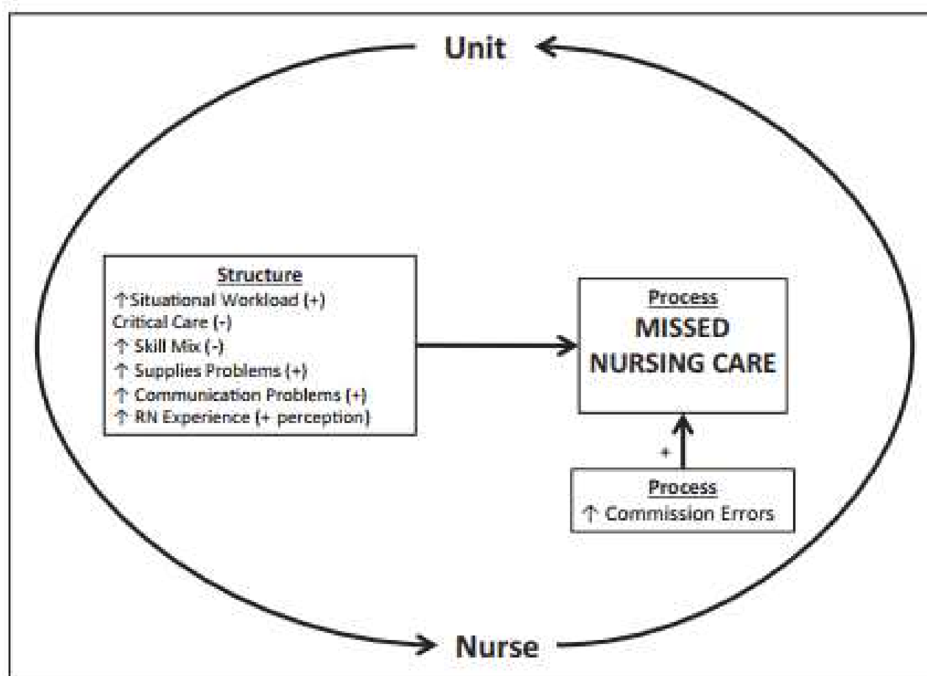
Figure 9 - Conceptual Model for Patient Outcomes and Organisational Features



Authors state "*the conceptual framework for this study (see Figure 9) describes how organizational features are related to patient outcomes and builds on the System Engineering Initiative for Patient Safety model (Carayon et al., 2006) and the Rationing of nursing care in Switzerland model (Schubert et al., 2007, 2008), adapted from the International Hospital Outcomes Study model (Aiken et al., 2002a,b)*". This model could be useful for studying outcomes in relation to rationing as interpretation of missed care. However, organisational factors are specific to acute, not community, settings.

Missed Nursing Care Theory (Castner et al 2015-)

Figure 10 - Missed Nursing Care Theory (Castner et al 2015-)



The aim of this study was to delineate the multi-level relationships of individual registered nurse (RN) and nursing unit factors on missed nursing care. Statistical findings led the authors to conclude that missed care related to contextual factors rather than individual nurse characteristics or other factors at the individual level.

Missed Care and Burnout: a Complexity Science Perspective (Thompson, 2014)

This PhD explores missed care and burnout from the perspective of Complexity Science. This study thus depicts another disciplinary theoretical framework which could be further explored.

Key findings from examination of theory

Theoretical models have been identified for the concept of missed care.
For the purposes of this review, most existing models are limited, having been designed for acute care settings, although examples of community nursing care models do exist. Most theoretical models are broad covering a systems-based approach to patient outcomes, however we identified examples where the role of technology was expressed theoretically (Patterson et al 2011; Wright et al 2015). Models tend to reflect the working environment together with processes to convey relationships. This approach offers an insight into links between concepts but also potential pressures on the system. The most explicit model to express this shift in unexpected demand is arguably the Patient Care Delivery model with its emphasis on inputs and predictors of care and the Principle Variables model with its emphasis on

workload. Higher level theoretical dimensions are present in a model e.g. social-related factors from a social psychology perspective (Bagnasco et al 2017). However, on the whole models are pragmatic and tied to organisational and individual level factors. It is worth noting that the MISSCARE survey is underpinned by the Missed Nursing Care model (Kalisch et al 2009) which frames omissions of care through threats to patient safety in a process of antecedents and consequences. The detail of outcomes is missing from some models but made explicit by O'Brien-Pallas et al (2001, 2002); this is potentially a useful target for further exploration where this resonates with the consequences of missed care identified in empirical papers in primary and community settings.

These findings from the wider literature on theoretical models will be contrasted with the models used in the empirical studies identified in the review for primary and community care settings.

A critical examination of 'missed care' metrics

Features of metrics

An emerging body of literature critically examines nursing metrics - previously identified in the scoping review in relation to skills mix (e.g. scales such as *Practice Environment Scale of the Nursing Work Index* or *Nursing Hours Per Patient Day* (Sworn and Booth 2018, p.19). This literature provides a useful tool for examining how concepts in nursing care are operationalised. This section of the review sought to identify metrics and measures for missed care and associated critical commentary within the literature.

Metrics identified can be grouped according to metrics and associated scales or instruments. Critical commentary on the limitations of metrics can be mapped against the metrics. Findings are summarised in Table 3 below.

Key findings

Table 3- metrics and critical commentary

Metric /scale/tool	Source that introduces/explains metric	Critical commentary
Missed care measure Including a Single-Item, Global, Estimate of Missed Nursing Care measure	Kalisch et al 2006 Tested tool to create MISSCARE survey- widely applied. Psychometric evaluation undertaken to evaluate. Applied in acute care contexts (medical surgical). Compiled through retrospective nursing accounts. Hamilton et al 2017 tested a single-item, global, measure using data from a large study of missed care in Australia found to be valid with strong sensitivity and specificity for identifying poor quality care	Kalisch and Williams 2009, the development and psychometric testing of a tool to measure missed nursing care Castner and Dean-Baar (2014) Used combination of MISSCARE and Practice and Professional Issues to measure nursing error but this was for various in-patient types **Hamilton et al 2017** Current measures of missed nursing care employ inventories of tasks which are rated for the frequency with which each is missed. These lists have shortcomings for research and clinical evaluation. Identifies need for measures with less response burden, wider generalizability, and greater sensitivity and specificity for identifying poor quality care. **See also unfinished care below for examination of MISSCARE instrument (Jones 2016)**
Unfinished care (including as a performance indicator)	VanFosson 2016 a performance indicator for nursing care systems- reflects the complexity of the nursing care environment	*Jones et al 2015* compared conceptual definitions and frameworks associated with unfinished care and related synonyms (i.e. missed care, implicitly rationed care; and care left undone) determined they were comparable or interlinked. They concluded: *"Our synthesis of conceptual frameworks suggests that unfinished care is conceived as a problem of time scarcity that precipitates the process of implicit rationing through clinical priority setting among nursing staff resulting in the outcome of care left undone. The most notable difference in the frameworks reviewed pertains to the process component of unfinished care and is most accurately portrayed as a difference of terminology rather than substance. The theoretical and qualitative evidence reviewed support implicit rationing as a form of clinical priority setting" p.1134* They also critique the method of obtaining data for unfinished care indicators: *"The gold standard for estimating unfinished care is arguably direct observation. The accuracy of estimates of unfinished care obtained through self-report compared to this gold standard is unknown and the potential for response bias must be considered." P.1134* **Jones et al 2016** Paper discusses what to consider when choosing and scoring surveys. Authors identified that unfinished nursing care is common in the inpatient setting and is associated with negative patient outcomes. They state "*this indicator is being assessed with increasing frequency to determine the quality of nursing services. Measurement bias was identified in this comparison of unfinished care surveys. Potential sources of bias should be considered when selecting and scoring unfinished nursing care surveys for quality assessment*" (ab). Relevant components to unfinished care operationalised through missed care survey are: • Comparison of MISSCARE and PIRNCA survey instruments • Description of components of MISSCARE and PIRNCA components

		• PIRNCA is designed for medical surgical in-patient settings. Respondents indicate when they were unable to complete tasks in the last 7 days due to lack of resources (indicated on a Likert scale) However, the PIRNCA survey underestimated number of activities. Whilst MISSCARE did not have items for evaluation of care, supervision of care or physical comfort. Nor, did it have items for items such as surveillance or communication with external agencies for discharge planning. Both were considered applicable and valid due to low incidence of items N/A. Both instruments are based on self-report and require respondents to estimate the frequency of unfinished care from their recollection of past events. This can introduce a type of recall bias. Moreover, no instructions related to a time frame or considerations of delegated activities are provided. Therefore, metrics do not reflect the cumulative frequency of patients cared for by multiple nurses Both measures were considered reliable for measuring missed care (for medical surgical population). However, certain forms of bias prevent the instruments being used interchangeably. They recommended the use of 'never' in scale
Implicit rationing of care	Schubert et al 2008	McKelvie (2014)- commentary piece referring to study about rationing of care in acute ward settings. Suggests form of data is needed: ""*intelligent information that tells us how are patients are today, or how staff are feeling about the workload or how the organisation is performing against targets and requirements*"".p.8
Care tasks left undone	Ausserhofer et al 2014; Sochalski 2004	None identified
Omitted care	Poghosyan et al (2017) present qualitative research on primary care provider perspectives on errors of omission (nurses and physicians) in the US. (Data from nursing perspective is not distinguishable therefore not included as an empirical paper.) PCPs reported the following errors of omission: omitting patient teaching, patient follow-up emotional support, addressing mental health needs. Factors contributing to omissions included: time constraints, unplanned patient visits and emergencies and administrative burden.	None identified

An overlap exists between some concepts and applications of terms which makes mapping of metrics challenging. Missed care, for instance has been defined as errors of omission (see Theoretical models section). Jones et al (2015) have questioned the use of the terms as discrete concepts. Missed care and unfinished care emerge as two of the most significant metrics. Key points from the critique of the metrics convey the importance of testing measures, the setting they were designed for and how data was collected.

Other notable papers pertaining to the interpretation of data and concepts to consider in this field are briefly outlined below. These concepts are important when considering either the likely quality of secondary data or the validity of measurements.

Dataset limitations are reviewed by Muntlin Athlin et al (2017). They explore methods, metric and research gaps around minimum datasets. They retrieved 20 studies. Settings were mainly nursing homes or hospitals. They established 14 fundamental aspects of care. Eleven of these aspects of care were identified in included studies but their frequency varied. The most commonly identified elements concerned: safety prevention & medicine, comfort and eating & drinking. Appropriate models, systems and standardised terminology are still needed in this area. This could eventually facilitate benchmarking and comparison of nursing practice. The authors suggest that performance measurements from electronic health records (big data) could be used in future because most practice data originate from routine diagnoses or interventions. (It appears that this paper seeks to ask whether fundamentals of nursing care are represented in how care is measured). The paper highlights how data comes from minimum datasets for the US and for Belgium and may therefore be country-specific.

Griffiths et al (2016), although focusing on nurse staffing and adverse patient outcomes (not specifically a metric for missed care), highlight endogeneity bias (overestimation of casual effects).

Jones and Schegel (2014) critique the value of self-report within a study of a nurse time tool. The study sought to develop a real time location system for capturing nurses time spent on tasks and motion through a device. This underlines the importance of accurately measuring time as a component of care. Jones and Yoder (2015) conceptualise time on care from a sociological perspective – they evaluate the psychometric properties of a newly adapted instrument to provide sociological measures of time.

Empirical findings: the impact of 'missed care' on safety in primary, community and nursing home settings

This section explores diverse aspects relating to the empirical review findings. (Methods are detailed in the Appendix 2 & 3). First, features of included studies are

described. Second, the narrative synthesis across studies is presented, findings across studies are examined and incorporated into a framework for assessing strength of evidence (adapted according to the principles of CERQual). This section explores each finding in turn. The final section offers a commentary on the theory and metrics applied in the included studies.

Features of included primary studies

The reviewers identified relevant records from 477 records identified from the bibliographic database CINAHL and a further 791 records in Google Scholar, in addition to those identified from supplementary searches. (Qualitative, economic evaluations and other forms of secondary analysis were added as study designs given the low yield of intervention studies identified by the reviewers). The review identified 8 publications to be included in the analysis (listed in the box below). These were derived from 5 studies, undertaken in three countries: Australia, Ireland and the US. The studies were all recent, being published within the last four years with data recently collected (the exception being data from Henderson et al 2016 which included data from a MISSCARE survey dated 2012).

Included studies were consistent in how they explored types of, and reasons for, missed care. The Phelan report (2016) and the Willis report (2016) (and related studies) represent an in-depth mixed method examination of community nursing and missed care in Ireland and Australia respectively. These initiatives employed diverse forms of data collection, such as interviews, a Delphi exercise and complex case profiles to gain an understanding of organisational and economic contextual issues beyond labelling causes of missed care. The focus of the Willis report (2016) aims to offer a methodology for staffing to determine percentage of staffing and skills mix. The evidence base is not plentiful but analysis draws on the wealth of information within these reports. Henderson et al (2017) present an additional study across three Australian states using quantitative and qualitative data applying the frame of types and causes of missed care to residential settings only. All studies, except the study by Nelson and Flynn (2015), adapt the MISSCARE survey (see further details in the Metrics section below). Henderson et al (2016) apply the same survey data as the Blackman (2015) report (set in one New South Wales region). All studies except Nelson and Flynn's study on missed care and Urinary Tract Infections take a broad approach to missed care. Finally, the Phelan report (2016) is included alongside 2 papers reporting the same data (2018a; 2018b). The studies were undertaken in community and nursing home settings. Australian studies refer to "residential aged care facilities" which may imply they are equipped to deal with more acute cases (these are not classified as "community services").

Typically, perspectives were generated from retrospective nursing accounts. Stakeholder, personal care worker and acute nursing perspectives were contained in

included studies (Henderson 2016; Phelan report (2016) and related papers). Willis (2016) incorporated the nursing managerial perspective.

Fluctuations in care were addressed to some degree in included studies- specifically, through a survey which required recipients to associate missed care with shifts. However, the evidence base did not include any longitudinal studies. The study by Nelson and Flynn (2015) was the only study to use secondary data. Nelson and Flynn (2015) used Nursing Home Compare (NHC) data; a national database containing nursing home level indicators, including patient outcome data, from the Online Survey Certification and Reporting (OSCAR) database and the Minimum Data Set (MDS) (aggregated to nursing home level).

In addition to the included papers reports on missed care were identified from the Tasmania and Victoria regions but these reports were not included due to a paucity of data on community or nursing home settings. For the same reason, a paper by Blackman et al 2015 (the larger study) was not included (related to Henderson 2016) because the data was not sufficiently distinguishable to satisfy the parameters of this review.

Figure 11 list of included studies

(1) Blackman, I. R., Henderson, J. A., Willis, E. M., & Toffoli, L. P. (2015). After hours nurse staffing, work intensity and quality of care-missed care study: New South Wales public and private sectors. Final report to the New South Wales Nurses and Midwives' Association (0994305001).

(2) Henderson, J., Willis, E., Blackman, I., Toffoli, L., & Verrall, C. (2016). Causes of missed nursing care: qualitative responses to a survey of Australian nurses. Labour & Industry: a journal of the social and economic relations of work, 26(4), 281-297. doi:10.1080/10301763.2016.1257755

(3) Henderson, J., Willis, E., Xiao, L., & Blackman, I. (2017). Missed care in residential aged care in Australia: An exploratory study. Collegian, 24(5), 411-416. doi:https://doi.org/10.1016/j.colegn.2016.09.001

(4) Nelson, S. T., & Flynn, L. (2015). Relationship between missed care and urinary tract infections in nursing homes. Geriatric Nursing, 36(2), 126-130.

(5) Phelan, A., & McCarthy, S. (2016). Missed Care: Community Nursing in Ireland. Dublin, Ireland: University College Dublin and Irish Nurses and Midwives Organisation Report.

(6) Phelan, A., McCarthy, S., & Adams, E. (2018a). Examining missed care in community nursing: A cross section survey design. Journal of Advanced Nursing, 74(3), 626-636. doi: 10.1111/jan.13466

(7) Phelan, A., McCarthy, S., & Adams, E. (2018b). Examining the context of community nursing in Ireland and the impact of missed care. British Journal of Community Nursing, 23(1), 34-40. doi:10.12968/bjcn.2018.23.1.34

(8) Willis, E., Price, K., Bonner, R., Henderson, J., Gibson, T., Hurley, J., . . . Currie, T. (2016). Meeting residents' care needs: a study of the requirement for nursing and personal care staff.

Table 4- Summary of features of Included Studies

Author	Country of lead author	Setting	Focus of study (including perspective)	Study design (including data source)	Analysis	Sample (Any specific population characteristics)	Measure of missed care	Explain adaptations made	Did the study take account of fluctuations in missed care?
1 Henderson et al., 2017	Australia	Residential aged care (Nursing home) In New south Wales, Victoria and South Australia	Why care is missed in residential aged care settings Nurses perspective	Cross-sectional survey	Quantitative (descriptive and inferential analysis) and qualitative- content analysis	922 nurses and carers in aged care facilities (157 qualitative responses analysed)	Kalisch (2009) MISSCARE survey also an open question	Adjusted demographic, terminology and work environment questions for context; added opportunity to respond about missed care in context of time of shifts	Yes- shifts element contextualised missed care question
2 Henderson et al., 2016	Australia	All types. Includes aged care setting (Nursing home) but not community settings in New South Wales	Causes of missed in acute and residential aged care settings (focus on impact of management of staffing and other resources on intensification of work) Nurses and midwifery perspective	Open question within a survey *qualitative data from one of these surveys was examined (2014)	Qualitative Content analysis	1037 from 4431 respondents they were nursing and midwifery organisation members from public, private and aged care facilities	Modified MISSCARE survey	Modified New South Wales survey with same modifications as Blackman et al (2015b) they kept the identification of missed care in particular shifts	Yes- shifts element contextualised missed care question

3 Blackman et al., (2015) report	Australia	All types. Includes aged care setting (Nursing home) but not community settings in New South Wales	The causes and impact of missed care	* Full report of study with 2014 MISSCARE survey reported across groups including residential care- link to Henderson 2016	Quantitate- SPSS descriptive statistics; qualitative- NVIVO analysis software	4431 New South Wales nurses surveyed (same as Henderson et al 2016)	Modified MISSCARE survey	Same as the above, they also mention the addition of 6 questions on rounding	Yes- shifts element contextualised missed care question
4 Willis et al (2016) report	Australia	Residential care	To evaluate a staffing methodology through 3 empirical methods Nurse and midwifery perspectives (including nursing managerial expert perspective) Survey includes nurses and carer perspective and support staff	Cross-sectional survey, focus groups (including production of resident care complexity profile case examples), Delphi	Tested profiles (included development of a care matrix model) evaluated through focus groups (qualitative content analysis); survey data – descriptive and Rasch analysis to determine tasks likely to be missed, multivariate analysis. Delphi consensus 80%	Focus groups- 7 national groups with 29 registered nurse and enrolled nurse and 2 PCW participants., survey 2932 respondents (RN 886, EN 834, nurse practitioners 32) survey also included PCW 962. Facilities offer high and low care across the country (a third from Victoria). (Private for profit and government facilities over-represented- fewer small government-owned rural respondents) Delphi- 102 site manager nursing staff identified across Australia	Modified MISSCARE survey for residential care.	Adapted for residential setting care tasks. 68 questions. Rank 27 factors of missed care	Yes- shifts (although the analysis of organisational factors only used the early shift as they found little variance across shifts)
5 Nelson and Flynn 2015	USA	Nursing homes	The aim of this study was to describe the	Quantitative analysis of survey data:	Descriptive statistics for missed care were examined in the	Nurses from New Jersey. Represented a random sample of 50% of	They developed	N/A	Yes- They identified long-stay

			frequencies and types of missed nursing care in nursing homes and to determine the relationship between missed care and the incidence of UTI among nursing home residents. Nurse perspective	A secondary analysis was conducted with a data set comprised of New Jersey nurse survey data and data from Nursing Home Compare.	nurse-level data set prior to aggregation to the nursing home level. (prevalence of UTI across the sample of 63 nursing homes were also examined). Bivariate correlations, regression models to determine predictors of UTI prevalence	nurses.340 worked directly in nursing homes, home met inclusion criteria and they were Medicare/Medicaid certified. Number of beds in home in sample ranged from 54 - 552	their own 12 item metric		residents but acknowledged difficulty in identifying asymptomatic cases, they did ask respondents to estimate perception of workload (workload perception survey)
6 Phelan et al., 2018a Same study as Phelan report (2016) and Phelan 2018b	Ireland	Community Nursing	The prevalence and reasons for missed care Nurse perspective - PHN & CRGN	Cross-sectional survey*	Descriptive data are presented using frequencies and percentages while Pearson Chi Square was used to explore associations between missed care data collected in Section B and C and categorical data in Section A. Also includes a psychometric evaluation	283 survey responses ((209 PHN 74 CRGN)	Questionnaire informed by MISSCARE survey	84 item survey, covered: demographics, missed care relating to CRGNSs and PHNs; missed care of PHNs only and reasons for missed care. Evaluation by a consensus group	Yes – see Phelan 2016 below
7 Phelan et al., 2018b	Ireland	Community Nursing	To consider the macro environment in which missed care occurs. Used reference group to develop	Qualitative study using semi-structured interviews*	Braun and Clarke's (2006) Thematic Analysis	Purposive sample of 4 community stakeholders (policy, union, representative organisation and a strategic disciplinary leader)	They developed a community version of the MISSCARE survey	84 item survey, covered: demographics, missed care relating to CRGNSs and PHNs; missed	Yes – see Phelan report (2016) below

			possible health economic implications for missed care. Community nursing stakeholder perspective.					care of PHNs only and reasons for missed care/. Evaluation by a consensus group	
8 Phelan & McCarty, 2016 report same study as Phelan 2018a and 2018b papers	Ireland	Community Nursing	The prevalence and reasons for missed care, an examination of the wider context and a health economics perspective Nurse perspective- PHN, CRGN	Survey; semi-structured interviews; health economics evaluation determined through a focus group with experts	statistical tests were conducted. frequency distributions Pearson's ChiSquared statistical tests to identify associations between missed care data collected in Sections B and C and categorical data collected in Section A. Survey tool psychometrically tested. For interviews see Phelan 2018b, interviews- thematic data analysis. Focus groups analysed by health economist (no method given)	283 survey responses ((209 PHN 74 CRGN) Interviewees- N 4 (see above) For gathering contextual perspective; health economic perspective from 5 nurses, 3 PHNs, 2 CRGNs.	Questionnaire informed by MISSCARE survey	84 item survey, covered: demographics, missed care relating to CRGNSs and PHNs; missed care of PHNs only and reasons for missed care/. Evaluation by a consensus group	Yes-In addition to the questions in survey, respondents were also asked to quantify the specific activity in terms of average times so that this could contribute to workload evaluation.

Narrative synthesis across studies

Types of missed care

Ongoing monitoring of patient needs

Ongoing monitoring of patient needs as a type of missed care was assigned a moderate level of confidence (see strength of evidence table below). Patient surveillance can be observed in both community and nursing home contexts (Willis report (2016) Delphi items 12-15; Phelan report (2016) care management items). Inadequate monitoring of patients in either context does not relate to direct, treatment-related care; yet it features in the types of care fundamental to nursing in these settings. The community–based context of the Phelan report (2016) found five out of the six items for care management recorded high levels of missed care with nursing care following a client reassessment reportedly missed 74% of the time during respondents' last working week (n=196) (table 13 p.34). Types of missed care appeared to relate to non-urgent non-clinical treatment tasks. Non-urgent monitoring and assessment or interactions were missed in the community context (Phelan report 2016) (a mixture of patient and non-patient time). Missed monitoring holds implications in relation to catching issues early and maintaining an accurate picture of the health and wellbeing of patients (see also findings related to follow-up for vulnerable groups). Ongoing monitoring captures a picture of health status and provides the assessment and reassessment for different conditions, whether this follows discharge, a diagnosis or an event. Ongoing monitoring relates to prevention e.g. Nelson et al (2015) explored general categories of care and relationships to urinary tract infections (as an indicator). Activities of missed care correlated with UTIs failure to provide adequate patient surveillance (in addition to failure to administer medicine on time) table 3 p.128. The authors remarked how missed care involved important assessment and interaction between the nurse and the resident. Assessments can be complex and time consuming; the Willis report (2016) illustrated this by providing complex case profiles for people with comorbidities (p.89).

Activities to optimise patient health and wellbeing

This aspect of nursing came across in community and nursing home settings. As with the finding above, patient health and wellbeing can be viewed as a form of indirect care. Such wellbeing could encompass broad aspects within a community setting. The Phelan report (2016) found educational nursing care providing clients with advice was missed more frequently. The report comments "*The types of care being missed are interesting to note. The highest level of missed care was recorded for nursing care activities related to health promotion, a key component of the role of the community nurse and an important aspect of the preventative aspect of community nursing in general and primary care in particular (Burke 1986; Hanafin 1998; Department of Health and Children 2001)*" p.47. Activities of daily living could

also be grouped within this theme as they provide a function of facilitation of care together with diverse personal needs and person-centred care. Examples of care missed in the profiles included the need for provision of extra time during activities of daily living; for example, tasks took longer with dementia patients who may require reorienting (Willis report (2016) p.57). Activities of Daily Living tasks most often missed in the same report were toileting within 5 minutes and response to the alarm bell (data includes carers and nurses). These tasks could be categorised as unscheduled and essential. Response to unexpected events giving rise to missed care is echoed in the other studies (see finding in causes section below). The Willis report (2016) found non-urgent, non-clinical tasks relating to optimising health were missed in residential home settings. Main aspects of care missed were mental health support, support and re-ablement. Tasks most often missed identified by the survey (for nurses alone) were similarly linked to behavioural types of care – emotional support (ENs). (This finding links to Relational care below). In the context of community nursing the Phelan report (2016) comments: '*Within, health promotion and general family support, there was a rationalisation of visits to clients to provide guidance and advice on how to manage care (51.2%, n=133), therefore, priority was given to tasks*' (p.75).

Relational care

Relational care describes the communicative and supportive function of nurses in advocating for patients and assisting with their emotional needs. This theme relates to the preceding findings relating to monitoring and wellbeing but is presented separately to reflect the distinct nature of the emotional support in one to one interactions. The Willis report (2016) examined behavioural forms of support required by nurses and identified instances of missed care (p.73 fig 4.7 see table above). Evidence of missed care exists in relation to anticipating escalating or severe emotional states. For instance, the Phelan report (2016) found, in relation to 'other community services', people with mental health challenges constituted a high level of missed care (69.9%, n=151) (p.72). By implication, missed mental health care could impact more on vulnerable groups in emotional or mental distress (see older people and vulnerable/disadvantaged groups finding below). Nelson and Flynn (2015) reported common missed care activities by type included comforting/talking with patients in the context of missed care associated with UTIs in nursing homes (table 3 p.128).

Older people related care

Findings related to older people emerged most explicitly from the Phelan report (2016) which specifically examined care of this population (p.33). Other studies in a nursing home context provide supporting, yet non-comparative, evidence. The Willis report (2016) outlines the context of higher levels of care provided in for-profit

private homes which can switch to a patient population with more needs (p.82). In respect of care for older people, follow-up from initial follow-up assessments and screening for risk assessments was missed a significant proportion of the time (Phelan report (2016) 57.1% (n=144) of cases during their last working week (Table 15) p.35). The survey captured follow-up on dementia patients which was also reported as missed care in the nurses last working week a significant proportion of the time (p.35). The associated table also indicates increasingly complex caseloads relating to older people's care requiring extra care time per task (Willis report (2016) p.49).

Administrative and patient documentation tasks

Missed care in documentation or administrative tasks was clearly identifiable from the data (Phelan report (2016) displays different types of administration tasks missed table 16 p.36). Tasks included maintenance of an at risk register for older people). Types of administrative task could be context specific; for example, paperwork required in nursing homes for funding or mandatory quality assurance (Henderson 2016 p.290). Competing administrative tasks can be conceptualised as a cause of missed care (see findings below).

Follow-up for vulnerable or disadvantaged groups

Survey data from the Phelan study identified missed care for vulnerable or disadvantaged groups, particularly in relation to follow-up. The study analysed survey findings for disadvantaged groups in community care (table 13 p.35), finding that care was missed for homeless, traveller, migrant and other populations (p.35). The Phelan report (2016) documented less missed care in relation to children and child protection care. For example, in the context of child protection the only care item missed above 50% was support provision and visits to families and children as part of a child protection framework (p.39). However, such visits might be critical to monitoring at risk families. In the broader sense, health promotion activities were missed across such groups as older people and heart disease patients (p.34). Data from the Willis report (2016) provides a less explicit indication about the impact of a lack of follow-up in these groups by outlining the requirements for reassessment for complex cases in the profiles (pp.46-65).

Failure to administer medicine on time

Central to this finding is the concept of 'on time'. This finding is best viewed in the context of the clinical tasks not missed (see below). Some evidence is derived from Nelson and Flynn's (2015) exploration of missed care for UTIs in nursing home contexts (one of two most associated items p.128). Blackman (2015) reports medicines are not available when needed but this data is examined in relation to causes of missed care and the evidence is not as strong (p.73). The Willis report

(2016) provides a further indication of medication administered within a time frames missed (p.75). Failure to administer medicine on time relates to the timeliness and urgency of tasks.

Availability of resources

Availability of resources was a relatively specific item of missed care (not related to staff resourcing). Items in the Blackman report (2015) related to functioning equipment and availability of supplies (item 9 & 10 p.72). Non-functioning equipment was the second most cited form of missed care in the South Australia region in the survey. The focus groups in the Willis report (2016) identified issues relating to time spent chasing missing equipment which needed to be factored into environmental or indirect timings (pp.43-44). The Phelan report (2016) comments on potential implications of equipment in the community setting: '*In the semi-structured interviews, one participant detailed that community nurses in an area familiar to her had technology to help community nursing staff deliver care, however, other participants noted this advancement was not uniform across the country with one participant in the focus group noting staff only got HSE mobile phones in 2014. The availability of basic technology can assist in reducing the administrative burden and electronic records may avoid duplication and help with the organisation of work as well as intra-disciplinary and interdisciplinary communication (Hussey and Roger 2014)*' (Phelan p.75).

Not missed

Clinical or treatment tasks

Clinical or treatment tasks specifically relate to procedures or treatment. Evidence related to two clear aspects of data reported; the Willis report (2016) found that medical procedures were missed less frequently (fig 4.7 p.74) while the Phelan report (2016) found low levels of missed care were reported for clinical nursing care that involved dressings, injections and other clinical interventions. Only 15% respondents indicated that clinical nursing care had been missed in their last working week. Basic nursing care involving client personal care was more frequently missed but still lay below the 50% threshold (p.37). In this community context, survey results in the Phelan study also found a low level of clinical nursing care was missed in the home (p.37).

Findings relating to clinical care are consistent with the concept of prioritising care between the most important patient problems (such as vital signs), then treatment tasks (minimising infection) and lowest priority nursing care (such as patient knowledge or documentation) in a theorised hierarchy of tasks based on rationalisation of nurse decision-making. Findings relating to clinical care exemplify

the typical decision not to miss treatment care. This was proposed as a hypothesis in Blackman (developed from Alfaro-Lefervre, 2008) (p. 17).

Other types of care

Public Health Nurses rarely missed care pertaining to child health. In relation to child protection the only care item missed above 50% was support provision and visits to families and children as part of a child protection framework (Phelan report (2016) p.39). However, this finding is only relevant to community care and primary care settings therefore data was limited.

Causes of missed care

The Willis report (2016) looked at the reasons for missed care within the same framework as the Phelan report (2016) and Henderson studies (2016; 2017), due to shared use of the MISSCARE survey. In the Phelan report (2016), the authors concluded missed care related to three major factors: inadequate staffing levels; unanticipated rise in client volume and/or acuity/complexity.

Increasing acuity of patients

A clear finding in relation to increased acuity emerged from the data. Evidence came from four studies (Specific concept identified in Phelan report (2016), Blackman report (2015), Henderson 2016 and Willis report (2016)). For instance, Blackman reports increasing acuity as the second most cited reason for missed care in New South Wales (2015, p72). Acuity was mentioned in qualitative findings on nurse perspectives; for instance, Henderson (2016) examined acuity explained by increasing levels of co-morbidities (p.287). The Phelan report (2016) explored acuity as one of three factors responsible for missed care, and found it to be a significant factor for 60% of respondents. (p.40). In the nursing home context, the Willis study highlighted the transition of private for-profit facilities to delivery of care for a population of older people with very high care needs (p.82). Qualitative data from Henderson (2017) highlights service-level pressures and acuity '*The increasing acuity of residents was also viewed as intensifying work leading to missed care. Increased acuity has arisen from pressure for hospital avoidance but also from the admission of residents with greater needs. A nurse from South Australia identified a "constant push to reduce hospital transfers and pressure to keep acute cases in facilities"*' p.413.

Increasing complexity of patients and care procedures

Complexity was often associated with the concept of acuity (above) and volume of workload (see finding below). Studies reflect a perception that patient cases and their associated care were becoming increasingly complex. Data on the increasing

complexity of patients and care procedures was identified in both the Willis (2016) and Phelan reports (2016). The Willis report (2016) highlights the increasing assessments, interventions, monitoring of complex cases. For example, the reported Delphi study reached consensus on the item '*Thinking of your resident profile, resident care needs have increased in volume and complexity and, over time, continue to increase*.' 98% agreement (p.90). The Willis report (2016) stresses the complexity of cases and related procedures/ interventions, stating that: '*Participants in the Focus groups and Delphi survey indicated that Residential Aged Care facilities are admitting a greater volume of residents with more complex needs who have shorter lengths of stay than previously*.' (p.8). To compound the issue, the findings indicate 'The interventions which are least frequently missed are: 'providing stoma care', 'maintaining nasogastric or PEG tubes', 'suctioning airways', measuring and monitoring blood glucose levels', and 'maintaining IV or subcutaneous sites'; however, when these occur, it is at the expense of other complex health care interventions that RNs undertake' (p.9). Qualitative interviews from the Phelan report (2016) reflect the complexity of cases in the community; suggesting that structural care needs to reflect this increased complexity, particularly of care for older people (Phelan 2018a, p.55).

Organisational/structural issues of service impacting on facilitation of care

The Willis report (2016) and the Phelan report (2016) contributed to findings relating to organisational and structural issues. Both reports sought to contextualise the missed care phenomenon from a service-level perspective. The Willis report (2016) offered system-level explanations for missed care in nursing home settings, shifting the responsibility of missed care away from the individual. Qualitative aspects of the study specifically focused on how management responded to missed care in combination with staffing issues (including skills mix and workload (pp.78-80)). The Willis report (2016) identified managerial challenges surrounding the response of management and the issues surrounding adequacy of staffing. The report underlined the responsibility of quality of care at the organisational level as well as the pressures that come from the expectations of relatives (p.34). Organisational staffing factors led to staff having to rush care when staffing was inadequate (p.84).

Organisational factors associated with missed care, analysed through the survey in the Willis report (2016), included:

- Ownership of facility
- Maximum number of residents that staff cared for on their last shift
- Staffing method
- Number of hours worked
- Capacity to ask for extra staff

• Workplace satisfaction (p.78-80)

The Willis report (2016) found that organisational factors associated with missed care included: workload, staffing, environment, other factors (jurisdiction (i.e. region where home was based) or size of the residential home). The report explores the issue of ownership of the organisation and the complex set of reasons which may include the relationship of clients; presence of a registered nurse, number of hours worked, communication/relationship including the opportunities to ask to help and satisfaction of nurses in the workplace (they provide models for the relationships between missed care and these factors p.78).

The Phelan report (2016) proposed several higher-level themes from qualitative interviews with stakeholders (although the data is rich, it is limited to four individual stakeholder perspectives (see table of data extraction). Themes were: lack of national leadership for discipline development, role changes and need for reform. The focus of the Phelan study (2018a) is on associations between organisational factors and missed care (in reiterating and expanding on the earlier report). The report details the qualitative work undertaken with key stakeholders within community nursing in Ireland. Qualitative comments underlined the lack of national leadership or direction for staff at the front line (p.36). These deficiencies held implications for future service planning (including staffing) and service integration improvements. (NB findings are reported within the context of phasing in community nursing services beneath a primary care umbrella). The lack of a standardised role was compounded by the other contributing factor to missed care- the increasing complexity of cases (Phelan report (2016), p.52).

Unexpected volume in workload

Unexpected volume in workload is linked to the acuity and complexity findings above in the extra time or workload generated. This finding incorporates the idea that unexpected or unplanned increases in workload lead to missed care. The primary aim of the study by Willis et al (2016) is to generate a revised staffing methodology that takes into account the full range of care undertaken in nursing homes to ensure safe staffing levels. Organisational factors which determine staffing and staff resourcing are also relevant to workload as a reason for missed care. Open question survey responses suggested extra staff were provided in some facilities when unexpected events occurred- this required roster management at an organisational level (p.71). In other evidence, within their inadequate support services theme, the authors identify lack of access to allied health staff (particularly medical officers) and increasing workload for aged care (Henderson, 2016, p.290). The Phelan report (2016) also signals an unexpected rise in workload as a reason for missed care; an

unanticipated rise in client volume and/or client acuity was a significant factor in care being missed for 60% of respondents (n=276) (p.40).

Inadequate staffing levels

Inadequate staffing levels are closely related to workload and staffing as a resource. Blackman (2015) reports inadequate staffing to be the most commonly cited reason for missed care in New South Wales (p.72). Willis (2016) also reports lack of nursing care staff as the most commonly cited reason for missed care (fig. 4.3 p.77). Data further highlights the impact of staff having to care for the maximum permitted number of residents on their last shift as a significant predictor of the frequency of missed care (p.78-9).

Phelan (2018a) explains that the role of the nurses was greatly affected by staff shortages leading to rationalising of practice (p.53). Rationing of health promotion echoed survey findings within the same study. Participants described difficulties in getting replacements for staff, also contributing to the rationalisation of care. Where care was rationalised participants felt that non-task work was not valued (p.54). Most commonly cited reasons for missed care in both quantitative and qualitative responses were lack of staff and increasing resident acuity (Henderson et al (2017), p.414).

Appropriately skilled nurses

The availability of appropriately skilled nurses (i.e. skills mix) was depicted as a factor contributing to missed care. The Willis report (2016) identified inadequate skills mix as the third most cited reason for missed care (fig. 4.3 p.77). However, the evidence was not as strong as for other themes identified above. This is because studies did not always examine separate nursing roles, or because a proportion of the data was qualitative or identified as preferred practice by the Delphi (Willis report (2016)). Henderson et al (2017) identified skill mix deficits as contributing to missed care across three Australian states. Qualitative data identified that "*concerns about the impact on resident safety of the replacement of nurses with carers were intensified by the inconsistent level of education of these carers. Poor regulation of Registered Training Organisations or RTOs (providers of vocational education) has contributed to difficulties in ensuring carers have sufficient knowledge to practice safely (ASQA, 2013). Education supplied… have varying clinical placement requirements that vary from 40 h to 150 h therefore skill levels is basic, varied and inconsistent (Survey NSW)'* (Henderson 2017, p.41).

Demands of documentation of care

Demands of documentation of care are also reported as a form of missed care (see type of missed care finding for administrative tasks above). This also includes

insufficiencies of administrative staff identified in nursing home and community settings (Blackman report 2015; Phelan report 2016, Henderson et al 2017). For instance, the Phelan report (2016) highlights lack of administrative or secretarial support 63% (n=273) while poor administrative or office infrastructure was identified by 25.2% respondents) (p.40). Blackman et al (2015) link inadequate clerical personnel for the Southern Australia region as a reason for missed care (p.72). Henderson et al (2016) identified a specific administrative burden associated with funding (p.290) and quality assurance (p.292). South Australian respondents in the Henderson (2017) study were significantly more likely to cite difficulties arising from "lack of assistive and clerical staff" and poor communication of care that is missed than staff in the other two states. However, the authors contextualise this finding by providing additional information about the sample (i.e. the survey was primarily completed by RNs who are more likely to undertake administrative tasks, particularly after hours, p.415).

Communication tensions between nursing team or other staff

The strength of evidence for communication tensions between nursing team or other staff is comparatively weaker. Examples derive from Australian nursing home contexts. Nurse participants in the Willis survey (2016) pointed to poor communication with allied health staff as a reason for missed care (p.75). Blackman et al (2015) cite communication tensions between nursing staff as the most important reason for missed care (in the South Australian region) (p.72). Another issue raised to some degree within the Willis report (2016) relates to cultural differences and cultural nuances (p.28).

Other factors

Other factors included cost containment as an influencing factor of the increasing work intensification of care; Nurses in residential aged care viewed cost containment as having a direct impact on staffing and quality of care (Henderson et al (2016) p.287). Increasing expectations of families also appeared in the data but data on this were generally lacking (Willis report (2016) p.82). Data on issues relating to access to other staff, such as primary care teams or medical officers, was also thin (Phelan report 2016; Henderson et al 2016).

Outcomes

Cost implications for care in the long-term

Little data on outcomes exists within the dataset of the retrieved studies. (Nelson and Flynn (2015) focus on the association of missed care factors with UTIs). One outcome which was stated explicitly was cost implications for care in the long-term. Data coherence is not ideal. Findings derived from the Nelson and Flynn study (2015) include additional treatments that may be required as a consequence of missed care

(p.129). The model depicted in the Phelan report (2016) also predicts admission to long term care (p.60). The same study also raises the longer term cost implications of insufficient child protection care (p.77).

Associations with missed care and workforce characteristics

As an additional note, this section briefly raises the associations of missed care and workforce characteristics. These characteristics are not demographic factors of nursing staff which cause missed care and they are highly context dependent, however, commonalities do exist related to staffing, individual or organisational factors. For instance, in the community nursing setting of the Phelan report (2016) certain respondent characteristics were associated with levels of missed care in the community setting: age profile (associated with a more frequently missed initial clinical needs assessment by nurses aged 25-34); follow-up with dementia clients was found within the 35-44 age bracket and finally, levels of missed care related to health promotion of heart disease and stroke were reported in nurses aged 25-34. (Although the association was significant it was weak at the 10% level). Educational level was associated with missed care for report writing. Results showed that nurses who did not hold a degree level qualification were less likely to report writing as a task missed in the last week (p.43). The Willis survey (2016) associates the following variables with missed care: role in the workplace; First qualification gained in Australia or elsewhere; Level of highest qualification; Employment status; Age of employee; and English as a second language (p.80).

Quality assessment

The results of the quality assessment were good per study. Quality Assessment forms are located in Appendix 4. Research designs were robust and data collected and analysed appropriately. The results are integrated into the assessment of the strength of the evidence (column about methodological limitations).

Exploration of strength of findings

Table 5 CERQUAL- Assessing the confidence in the qualitative evidence

Data supporting review finding	Assessing coherence	Assessing relevance	Assessing adequacy of the data	Assessing methodological limitations	Assessing overall confidence in the finding (high, moderate, low, very low)
Type-missed Administrative and patient documentation tasks	Evidence in nursing home context		Survey data – Phelan non-patient (administrative tasks all reported as missed e.g. 79% reported updating client notes missed in last week table 16 p.36) Henderson (2016) aged care compulsory documentation burden p.290	Some opportunity to specify 'other' items	low
Activities to optimise patient health and wellbeing (activities of daily living, health promotion/visitation, advocacy, re-ablement)		Community setting under - represented	Willis report (2016) identified missed care around all of items in activities of daily living for RN and EN. Survey also identified aspects such as facilitation of engagement, decision about care, dignity, and support to maintain interests all identified as missed care tasks. Delphi item 22 in the same report also centred on allocating staff number according to staff it takes to undertake activities of daily living Willis report (2016) indirect factors associated with care analysed fig4.4 – e.g. missed care around prevention ad relief of residents' distress and promotion and maintenance of residents' health and maximising residents' life potential. Section B of Phelan report-health promotion		moderate
Ongoing monitoring of patient needs (included assessment, reassessment/surveillance/visitation following event or in general)	These can be broad topics	Nelson- Nursing home and UTI (quite a narrow context) – revealed failures to provide adequate patient surveillance (including important assessments) Phelan report- failure to maintain at risk register Different settings	Nelson items of missed care- adequate patient surveillance was one of 2 strongest associated factors with missed care (p128) Phelan monitoring and follow-up in community cases well described in data- A total of 6 items were categorised as 'Care management' as part of the survey. The tasks related to aspects of client care management such as client assessments. Assessments also feature in older people and vulnerable groups p.34 (For observation monitoring see finding below about clinical care missed infrequently). A Delphi item (22) which reached consensus from the same study argued for staffing built around ability to meet residents needs on an ongoing basis. In the same study the 6 profiles (validating through FGs for staffing methodology) underlined the complexity of assessments for complex cases (p.89). The items 12-15 all contain statements around assessment, after an unplanned event for instance.	Nelson- specific types of missed surveillance not captured in design Phelan report- PHN only and in context of child protection the only care item missed above 50% was support provision and visits to families and children as part of a child protection framework (p.39)	moderate

			In the Phelan report (2016) educational nursing care that provided home clients with guidance and advice on how to manage care was reportedly missed 51% of the time in the preceding working week (Table 18 p.37)		
Follow-up for vulnerable or disadvantaged groups	Detail on different disadvantaged groups in Phelan report (2016) but these are not addressed in other data (with the exception of older people)	A proportion of nurses responsible for some vulnerable groups caseload e.g. asylum seeker, homeless populations (Phelan report)	Phelan report (2016) - follow-up from initial follow-up assessments and screening for risk assessments was missed a significant proportion of times- 3 of 5 items missed related to assessment for these groups (table 13 p.35) Specificity of the data from survey adds weight to finding- disadvantaged groups, it emerges care was missed with homeless, traveller, migrant and other populations (p.35). Data in the Willis report (2016) indicates the complex health needs of residents such as dementia and PTSD. A wide range of medical and mental health ongoing assessments are presented per profile.	The Phelan report (2016) included disadvantaged groups missed care category in their missed care survey in community care contexts- however in relation to vulnerable groups only a proportion of nurses worked with this caseload. Methodological limits of complex case examples (6) evaluated by focus groups	Very low
Older people related care	Patterns associated with this theme: Phelan report (2016) -follow-up with dementia clients was found to be missed within the 35-44 aged nurses bracket	Relevancy of older people's needs in relation to missed care from nursing home settings can only highlight potential issues in community settings (does not provide evidence that in wider contexts older people have high frequency of missed care)	Mentioned as a theme in examination of contextual factors (particularly chronic conditions care) (Phelan report) 3.7.1 also survey in section B captured data about missed care and older people (p.33 report) also within disadvantaged groups (same section) compared and types of missed care associated with certain groups (care missed for initial assessment, risk screening and dementia care p.35) Data from residential homes is rich – Willis report (2016) includes qualitative and survey findings indicated there needed to be extra care (including assessment) following an unexpected event (p.84; p.71) and from the complex case profiles the behavioural assistance care or reorienting or extra time for toileting care needed for certain conditions (p.49) No data from primary care contexts and older people		low
Relational care (can involve emotional or mental health support or day to day communication)	Inferred also through family visitation follow-ups missed in Phelan report (2016) (breast feeding support and family visits and support) (p.26)		Nelson and Flynn (2015) raise this as a discussion point (p.129) Aspects of relational care in the Willis report (2016) within the domain of behavioural care (fig 4.7 p.73) include: interacting with residents when they have problems with communication, providing residents with activities to improve their mental and physical functioning, providing emotional support for residents and/or their family and friends (p.74).The case profile 2 also provided an example of the emotional support needed for a patient with complex needs (p.52). Phelan report – other mental health services referral missed		low
Failure to administer medicine on time	Contradictory evidence about medications tasks (see theme below about clinical tasks not missed)- 'on time' aspect appears important to differentiate	UTI prevention (Nelson and Flynn 2015)	Complexity of this issue as is related to timeliness and urgency of tasks Failure to administer medications on time was one of 2 most associated factors with missed care for UTI (p.128) (this alongside surveillance explained 40% of variance in sample (table 4 p.128) Willis item in survey: Giving medications within 30 minutes of scheduled time Ensuring PRN medication acts within 15 minutes missed by RNs and ENs a significant proportion of times in residential care settings (p.75)	Nelson study includes a narrow remit and range of indicators Blackman evidence surrounds reasons for missed care not type	Very low

			Some evidence from the Blackman report that medicines were not available when needed (item 6) p.73		
Availability of resources (e.g. functioning equipment)	Supplies of equipment not as significant according to Blackman report data (p.73 fig 5.1) The availability of equipment and poor communication with allied health staff were least cited as having an impact on missed care (Phelan report (2016) p.75)	Item 10 significant for South Australia region only	Blackman p.72 item 10 functioning equipment reason behind missed care Phelan report		Very low
<u>Not missed/missed infrequently</u> Clinical or treatment tasks	UTI tasks provide a limited range of interventions (Nelson and Flynn) Blackman reports care missed (particularly in South Australia state) nursing home facilities related to response to urgent patient situations p.72	Phelan report (2016) on community support residential care settings	Willis report (2016)- medical procedures were missed less frequently by comparison (table 4.7 p.74). These included maintaining IV sites, gastric tubes and Suctioning airways/tracheostomy care. Phelan (report) states low levels of missed care were reported for clinical nursing care that involved dressings, injections and other clinical interventions with only 15% respondents indicating this had been missed in their last working week. Basic nursing care involving client personal care was more frequently missed but was still below the 50% threshold (p.37)	Surveys provide specific missed care types which are reliable evidence	low
<u>Causes</u> Increasing acuity of patients	Henderson 2016–some association to comorbidity but not very rich detail to establish a pattern	The Blackman reports New South Wales state has the lowest proportion of nurses per 100000 of the population p.19	Specific concept identified in Phelan report, Blackman report, Henderson 2016 and Willis report (2016) Blackman reports acuity as second most cited reason for missed care in NSW (p.72) From the discussion in the survey data findings and the qualitative data in the Willis report (2016), the researchers relate acuity of residents has increased with changes in governance and private care facilities moving towards higher care clients (p.82) Henderson 2016- For aged care nurses, increased acuity related to comorbidities p.287 Phelan report (2016) took three aspects to explore association with missed care, one was acuity – 'Unanticipated rise in client volume and/or acuity/complexity'p.40 An unanticipated rise in client volume and/or client acuity was a significant factor in care being missed for 60% of respondents (n=276) Qualitative data from Henderson 2017 highlights service-level pressures and acuity p.413	Limitations qualitative data collection in Willis report (2016), Henderson 2016 data not very rich in relation to aged care specifically	moderate
Increasing complexity of patients and care procedures	What complexity means is not always fully described	Willis report (2016) - Findings from the MISSCARE survey show that RNs identify more missed care related to Activities of Daily Living (ADLs) and complex health care than ENs and PCWs p. 8.	Phelan report (2016) description and major theme (see above) Henderson (2017) frames the qualitative work according to why it was difficult for nurses to meet complex health needs Willis complex case profiles highlighted the complexity of assessments for patients with complex health conditions within complex health needs domain (p.89) The Willis report (2016) Delphi study also reached consensus on the item 'Thinking of your resident profile, resident care needs have increased in		moderate

		Willis report (2016) on reasons for missed care includes perspectives of PCWs	volume and complexity and, over time, continue to increase.' 98% agreement (P.90) Willis report (2016) also stresses the complexity of cases and related procedures/interventions (p.8).		
Unexpected volume in workload	Henderson 2016 related fluctuating workflow to 'short-shifting' Client volume concept Phelan report Phelan report (2016) uses both complexity and acuity in item developed p.40	Specific type of service described by Henderson 2016 that can lend staff from acute services	Workload and workflow mentioned in Henderson 2016 – lack of access to allied health professionals exacerbated the workload of nurses because staff from aged care were borrowed for acute (p. 288). Increased workload emerging from acuity and rise of 'sub-acute care' p.287 Willis mentions this concept through unexpected events and their impact on missed care in the qualitative data '*RNs, in particular, identified difficulties in meeting workload expectations. RNs reported that nurse to resident ratios are such that, if something unexpected occurred, they would be unable to complete their regular tasks' p.84* Phelan report (2016) also points toward unexpected rise in workload as a reason for missed care-An unanticipated rise in client volume and/or client acuity was a significant factor in care being missed for 60% of respondents (n=276). Nelson and Flynn workload affects not significantly associated with missed care (p.128). Increased workload without appropriate support identified by Phelan report (2016) survey as an 'other' factor in section D p.40. Willis report (2016) identifies too many residents with complex needs as the second most cited reason for missed care (p.75)	Nelson and Flynn did not refer to the unexpected element in analysis Willis unexpected event echoed in survey data (though an indication) *'The responses suggested that extra staff were provided in some facilities when unexpected events occurred'* p.70	moderate
Appropriately skilled nurses	Statement in Willis report (2016) 'for your area' could be clearer	Fewer skilled nurses is the reason Henderson 2016 (p.228-9) reports it is difficult for nurses to meet complex health needs. However, skills mix appears to come out more strongly in acute care context in same study Willis report (2016) on reasons for missed care includes perspectives of PCWs	Willis report (2016) identified inadequate skills mix for particular area as the third most cited reason for missed care (fig. 4.3 p.77) In the same study item 19 of the Delphi stated *A staffing methodology must include the building block of identifying the lowest level in the skills mix of staff who can perform the activities to meet the assessed needs of different resident profiles* Skill mix identified as contributing to missed care in Henderson (2017) qualitative data p.414	Limitations of minimal qualitative data. Delphi evidence is based on complex statement of preferred staffing	low
Inadequate staffing levels	Challenges in finding replacement considered relevant contextual factor (Phelan report (2016) p.53) Staff shortages led to rationalising practice – Phelan report (2016) p.54	Willis report (2016) on reasons for missed care includes perspectives of PCWs	Willis report (2016) lack of nursing care staff as the most commonly cited reason for missed care (fig. 4.3 p.77) Also Impact of maximum number of residents' staff cared for on their last shift a significant predicting factor on frequency of missed care p.78-9 Relevant to other qualitative aspects of Henderson 2016 concerning staffing ratios (p.287)	Qualitative data on rationing	low

			Increased workload without appropriate support identified by Phelan report (2016) survey as an 'other' factor in section D p.40. Blackman report- inadequate staffing main item cited by nurses in NSW (p.72)		
Organisational/structural issues of service impacting on facilitation of care		Perspective of stakeholders in Phelan report	Phelan report (2016) final higher level themes in the qualitative interviews were: lack of national leadership for discipline development, role changes and need for reform (p.50) Qualitative element of Willis study focused on responsiveness of management towards workplace issues relating to missed care.	Limitations of qualitative evidence (Phelan report- small sample of interviewees, Willis report (2016))	Moderate
Demands of documentation of care (includes lack of administrative support or increased admin demand)	Blackman links inadequate clerical personnel- for SA region (and includes care assistant workers in addition to admin in item 4)	Henderson 2016- Australian quality assurance paperwork (specific context)	Phelan report (2016) highlights lack of administrative or secretarial support 63% (n=273) also poor administrative or office infrastructure was identified by 25.2% respondents) Blackman links inadequate clerical personnel- for SA region p.72 Administrative burden identified by Henderson 2016 for funding p.290 and quality assurance p.292 Lack of clerical assistive staff Henderson 2017 was significant (table 2 p.414) Henderson 2017 South Australian respondents cite difficulties arising from "lack of assistive and clerical staff"		low
Communication tension between nursing team or other staff	.	NSW context (Blackman) & Henderson 2017- This may reflect the sample from South Australia as the survey was primarily completed by RNs who are more likely to undertake administrative tasks, particularly after hours	Henderson 2017 South Australian respondents cite difficulties arising from poor communication of care that is missed Blackman report the most significant reason behind missed care in NSW in Figure 5.1 was item 1 and in SA item 13, (inadequate number of staff and communication tension between nursing staff respectively). 'Other issue' was communication Henderson 2016 p.291 Willis report (2016) - Respondents with English as a second language report higher levels of missed care in relation to preventing and minimising resident distress, and with care tasks which maximise the residents' life potential. Both may be related to communication difficulties and differences in cultural nuances p.82		Very low
Outcomes Costly implications for care in the long term			Nelson and Flynn 2015 (p.129) adverse outcomes and associated costs discussed in discussion – requirement of UTI incidents of additional treatment and monitoring Implication identified by Phelan report (2016) for lack of assessment and other missed care was admission of patients in the community to long-term care p.60. Also longer term cost implications of child health and protection raised p.77	Phelan reports longer-term implications as a discussion point	Very low

Summary of gaps in the evidence

It is possible to observe gaps in the data by looking across outcomes of missed care in particular (only one outcome relating to long term care costs was identified). The narrative analysis of data in the findings section above identified low or very low confidence in several findings based on weight of evidence or the limited relevance of a single setting perspective. Beyond the findings identified, more research is required to build a more complete and detailed picture of missed care and safety risks. This would include: research in primary care settings; in-depth perspectives of nurses/service managers/patients; evidence on policy and service factors which could have protective or prohibitive influences on missed care; economic/cost impact analysis; and the impact of missed care on peripheral factors such as nurse training, job satisfaction, nurse turnover or patient satisfaction.

Theory and metrics identified in the primary studies

Metrics

All studies except Nelson and Flynn (2015) applied an adapted MISSCARE survey. The Phelan report (2016) summarises the impact of the MISSCARE survey to understand the issue of missed care, "*The MISSCARE survey developed by Kalisch et al. (2009a, b; 2006) has been validated for use in acute hospital settings both in the US and internationally (Kalisch et al. 2012; Kalisch et al. 2013; Kalisch and Williams 2009; Blackman et al. 2014). The survey is informed by the Missed Nursing Care Model and uses a four-point Likert scale to measure missed care and reasons for missed care. In the MISSCARE survey, levels of missed care are measured using a series of twenty-two established nursing actions while three constructs governing reasons for missed care are captured using sixteen validated items (Kalisch and Williams 2009).*" (Phelan report 2016 p.21.)

Appendix 5 compares adaptations or creation of survey items for missed care in diverse settings. This demonstrates adaptations made to MISSCARE for community and nursing home contexts. The Phelan report (2016) included the following missed care categories in their survey of community care contexts: home nursing care, care management, family support, older people, health promotion, disadvantaged groups, education, provision of other community nursing services, primary care teams and administration. This may offer a good framework for missed care in a community context (table2 p.23). The same study used psychometric evaluation of the survey to improve confidence in its reliability and validity (the Willis study also validated their measure (2016). The remainder of the studies set in an aged care facility context tend to focus on activities of daily living, assessment and behavioural aspects of care, in some ways their remit is narrower but, nevertheless, aspects of direct, often complex, personal care emerge.

Theoretical Models:

Models and frameworks used to capture missed care varied across studies – none were specific to primary or community care. The Phelan report (2016) and accompanying paper (2018a); Henderson (2016 & 2017); the Blackman report (2015) and the Willis report (2016) all apply the MISSCARE survey (also see Blackman et al paper (2015) in main references list)– this survey draws on an implicit framework based on 3 antecedents for reasons for missed care: lack of labour resources, lack of access to material resources and inadequate relationship and communication factors to deliver care (see previous Theoretical Models section). This tends to lead to an empirical explanation of prevalence, types and reasons for missed care. Blackman et al (2015) adapted a conceptual framework for the hierarchy based on urgency of care (Lower Priority Intermediate priority High priority). (Table 2.1: Hierarchy of missed care items after Alfaro-Lefevre (2008)). However, this conceptual framework was equally intended to be applicable to acute care contexts. Nelson and Flynn (2015) use Aiken's et al (2002) model of nursing organisation and outcomes (missed care is an indicator for nursing processes impaired by inadequate surveillance). Missed care was therefore viewed as a mechanism caused by nursing care processes and led to adverse events (p.127). Evidence from the earlier analysis of theoretical models suggests that further research could benefit from extending models to reflect adaptations to the survey (O'Brien-Pallas et al, 2001; 2002) for instance have tested their model in community settings). Other organisational or psychosocial models may also be applicable (Bagnasco et al 2017).

Discussion and limitations

This review highlights the dearth of evidence base for missed care in primary care, However, the Phelan report (2016) acknowledges that distinctions between primary, community and nursing homes are complex to define and exist on a continuum. Included studies provide data on community care and nursing home settings. Findings echo Bagnsaco and Timmins' editorial commentary (2018) on the Phelan report (2016), drawing attention to how missed care in community settings impacts on vulnerable groups in particular.

Common findings were identified in types and causes of missed care across nursing home and community settings. Key types of missed care related to optimising health; ongoing monitoring of patients; relational care. Other less significant findings related to particular groups or specific tasks (e.g. care follow-up activity for vulnerable groups and older people, availability of resources and administration of medicine on time). In relation to causes of care missed, reasons emerged surrounding acuity, complexity of cases, volume of care, and organisational factors. Less well-evidenced issues surrounded appropriately skilled nurses, inadequate staffing levels, documentation of care and communication issues. The majority of the metrics and

theoretical principles behind the studies were derived from the MISSCARE survey and corresponding model (Kalisch, 2009).

The report from Willis et al (2016) included in the study remarks how the interpretation of missed care is shifting in an undesired direction i.e. from organisational or system level explanation to the individual "…*a belief that responsibility for quality of care has been shifted from systemic determinants, such as increased resident acuity and funding shortfalls, to the individual nurse or carer*" (p.83). The same study then seeks managerial nurse perspectives on a staffing methodology.

The long term implications of missed care have been hypothesised by Phelan et al (2016) (including costs of higher level of care and increased physical and mental support required) (diagram on p.60). Data are lacking on the consequences of missed care and possible interventions. For instance, Pogosyan et al (2017) characterise possible interventions in a primary care context under the category of 'omission safeguards' (study omitted from the empirical studies as the nurse role and perspective is inseparable from that for other primary care providers) (table 3 p. 737).

Missed care in primary care contexts:

Although no studies are explicitly set within primary care, relevant information can be extracted from included data. The Phelan report (2016) revealed missed care for community nurses within primary care teams (p.34). (Community nursing in Ireland is moving beneath the umbrella of primary care provision). Nurses attended the meetings and referred clients to other health care professionals (Findings revealed meetings were missed whereas referrals were not generally missed p.34) (also incorporated into missed care items). Also, participants observed the ad hoc introduction of the Community Registered General Nurses (after the reduction of Public Health Nurses) (p.53). This emerged as a potential issue in relation to a lack of planning for skills mix or career pathways. The report emphasised the generalist role of the community nurse in Ireland with the lack of a clear distinction in division of work for nurses in older people and hospital discharge and new mother, and children. (In the UK this role is divided between district nurses, health visitors and midwives) (p.61). Finally, a study by Hutchins (1989) was excluded due to the limited relevance of vaccination visits but represents the only other example of a primary care context.

Limitations

One limitation of the review was the geographical parameters of the empirical studies. Excluded studies from countries such as Switzerland and Belgium might have contributed to missed care research.

Limitations of the evidence base itself have been examined in detail within the review and specific and systematic indicators of confidence have been provided. As such, every effort was made to make the search as comprehensive as possible, utilising supplementary forms of searching for instance. However, where research is less well indexed it may have been missed within the search.

Summary and Implications

Summary of findings

Main review findings for the three review components are summarised in Box 1.

Box 1 - Summary of Review Findings

- Evidence indicates that missed care impacts on safety in community and primary care contexts- and these may differ from acute care.
- Quality of evidence is robust but breadth across contexts and populations is limited.
- There were common findings identified in types and causes of missed care in nursing home and community settings.
- Central findings for types of missed care related to optimising health; ongoing monitoring of patients; relational care.
- Less significant findings related to particular groups or specific tasks (care follow-up activity for vulnerable groups and older people, availability of resources and administration of medicine on time).
- Missed care may hold particularly severe implications for older people and people with complex conditions.
- Missed care could have long term effects relating to cost if it is inhibiting monitoring, prevention and assessment of patients.
- Missed care experiences may differ across different groups, impacting upon some more than others (e.g. people with mental health challenges).
- Causes of missed care identified were: patient acuity, complexity of cases, volume of care, organisational factors.
- Pressures from the system, in terms of financial constraints and policy or management, play a broader role in the missed care phenomenon.
- Missed care causes may be unique to either community, primary or nursing home settings (e.g. caseload complexity).
- Less well-evidenced issues surrounded appropriately skilled nurses, inadequate staffing levels, documentation of care and communication issues.
- Gaps in the evidence have been identified, especially primary care contexts.
- Theoretical models have not been tailored to community primary contexts in empirical studies in these contexts.
- Metrics have been adapted to these contexts but not in a standardised way.

Implications

Missed care impacts on safety in diverse ways. However, missed care is rarely conceptualised as outcomes directly relating to patient mortality. Empirical findings from this review link missed care to patient outcomes such as UTIs and costs relating to long-term care. However, research has focused on types of missed care and associated causes of missed care (including organisational level factors). Service delivery pressures are a contributory factor to missed care and offer the potential for sub-optimal care and suboptimal management of health conditions. Yet the outcomes relating to missed care remain under-researched.

Further empirical studies are needed nationally and internationally to examine missed care in community, primary and nursing home contexts. This will build on evidence for examining the types, causes and outcomes of missed care.

Included studies suggest that secondary datasets need to be improved, or routine data collection initiated, to capture missed care in community, primary and nursing home settings. Standardised surveys and metrics would make studies more comparable.

Research should identify specific interventions or measures to combat missed care for older people in the community.

Increasing patient complexity and acuity has emerged to reflect the prevalent demographic of patients within the community. Care that is regularly missed for complex patients holds potential safety implications; similarly, more complex cases may absorb more care time.

Clear definitions of nursing role and care tasks are required to facilitate cross-national comparisons. Relationships between missed care, nurse characteristics (such as level of training) and safety could be explored further.

At the systems level the role of environmental or organisational factors could be explored relating to patterns of collaboration with other health or social professions and could examine any implications for quality or continuity of care.

Further economic estimates and projections would improve the understanding of the impact of missed care, especially as data identified in the review indicate that the implications of missed care could be experienced over the long-term.

A review of policy at different practice levels could elucidate the different minimum requirements for nursing care required by nurses, including the level of burden or benefit these pose (e.g. mandated paperwork)

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Appendix 1 – Included studies

Theoretical model papers

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Appendix 2 - Methods of the Scoping Review

The key steps in the review are:

- Identifying the research questions
- Identifying relevant studies
- Study selection
- Quality assessment
- Charting data
- Summarising and reporting results

Identifying the research questions

An a priori review question was agreed as:

(Aims of the review are specified on p.8. This led to empirical and conceptual elements consisting of a theoretical model review, critical examination of metrics and a review of empirical studies).

See protocol appendix 2

Identifying relevant studies

Primary research studies conducted in the big five countries most influential on UK practice (i.e. UK and Republic of Ireland; Australia, Canada, New Zealand and USA). No such limitation was applied to the identification of missed care theoretical models or papers critiquing missed care metrics. Date limits were not applied.

The search strategy for Review Questions 1 and 2 is depicted in tabular format, providing the definitive search terms and the number of hits for each database source. This review also utilised the previous scoping review conducted to map the broader topic of skills mix (see protocol in appendix 3).

Search strategy

Database	Empirical Studies	Metrics	Theoretical Studies	No of Hits
CINAHL	"Missed nursing care" OR "care left undone" OR "unfinished care" OR MISSCARE OR (("Missed care" OR "missed opportunities" OR Missed opportunity OR omission OR omissions) AND (primary care OR primary healthcare OR community OR nursing home OR nursing homes)	"Missed nursing care" OR "care left undone" OR "unfinished care" OR MISSCARE OR (("Missed care" OR "missed opportunities" OR Missed opportunity OR omission OR omissions) AND (metric OR metrics OR measure OR measures OR measuring OR monitor OR monitoring OR evaluation OR evaluate OR evaluating OR tool OR tools OR scale OR scales)		477
Google Scholar	"Missed nursing care" OR "care left undone" OR "unfinished care" OR MISSCARE OR ("Missed care" AND (Nursing OR nurse OR nurses)) AND (theor* OR concept* OR framework* OR model*)		"Missed nursing care" OR "care left undone" OR "unfinished care" OR MISSCARE OR ("Missed care" AND (Nursing OR nurse OR nurses)) AND (theor* OR concept* OR framework* OR model*)	791

Study selection and quality assessment

Inclusion and exclusion criteria are documented in the accompanying protocol. Study selection of primary studies was undertaken by the Research Associate (KS).

Items were prioritised for selection by searching for keywords associated with the review question and research design types that were strongly indicative of an empirical study (e.g, cross-sectional; design). Clarification was sought from the systematic review methodologist (AB) in cases where inclusion/exclusion was unclear or where the initial scope required further refinement. A proportion of the records were double screened by another member of the project team (JS).

Charting data

Data extracted from systematic reviews for the empirical studies was imported into Excel and characteristics were extracted. In-depth data was extracted for each study in the categories which emerged from the data (types, causes and outcomes of missed care. The key findings were imported into a framework based on CERQUAL to provide a transparent basis for assessing the strength of evidence and gaps. This included the Quality assessment element to gauge limitations of the evidence, according to the research design either SURE or CASP were applied. The theoretical and metric based examples were identified and appraised according to strengths and weaknesses. Empirical findings were then critically examined in light of the theoretical and metric papers identified.

Summarising and reporting results

This report is prepared for the University of Sheffield (UoS) School of Nursing team in the first instance with a subsequent version to be shared with the Royal College of Nursing. A systematic review protocol will be completed and registered on PROSPERO.

Appendix 3 - Protocol

Rationale

The review informs the work of the RCN-University of Sheffield Strategic Research Alliance, in policy-making and new research.

Definitions of terms

Missed care:

Nurse: Registered practitioner, including entry level nurses and up to advance practice nurses (variety of titles).

Nursing care provider: unregistered nursing assistant (variety of titles).

Nursing team (following Griffiths et al[14]): ...the group of workers delivering 'hands on' nursing care on wards (including 'basic' care to meet patients fundamental needs and technical care, including aspects of care generally undertaken only by registered staff, such as medication administration). This would include all necessary administrative assessment and planning work (e.g. documentation, discharge planning). Members of the nursing team may include both registered nurses and unregistered support workers or assistants, regardless of job titles.

Safety: prevention of harm or adverse events in health care across diverse patient groups and care contexts (based on a definition of 'safety practice' in a US review of patient safety practices[8]). An expanded definition of 'patient safety' could also be employed thus: ...prevention of medical errors and avoidable adverse events, protection of patients from harm or injury and collaborative efforts by individual healthcare providers and a strong, well integrated healthcare system [9].

Methods

The key steps in the review are:

- Identifying the research questions
- Identifying relevant studies
- Study selection and quality assessment
- Charting data
- Summarising and reporting results
- Consultation exercise

Searches

Searches will be performed in BNI, EMBASE, MEDLINEdatabases.

(A database search of CINAHL was performed by reviewers to build on scoping review searches in Pubmed and CINAHL conducted in the skills mix scoping review, The reviewers also conducted a systematic search of Google Scholar using terms in search strategy table above (p.56). The reviewers were satisfied this combination of searches (electronic and supplementary searches) would provide a good platform for the identification of relevant publications in the review. However, restriction of the search to two major sources is acknowledged as a limitation of the review.)

Supplementary searches of key reports, systematic reviews, theses references, studies known to authors. This included a previous scoping review (2000-2018) which had combined database searches of Pubmed, Cinahl and Google Scholar with supplementary searches on the broader topic of skills mix and patient outcomes (Sworn and Booth, 2018).

(The conceptual review utilised the same database and Google Scholar records).

Identifying Research questions

Review Questions:

How do the factors associated with the concept of 'missed care' relate to safety outcomes in primary, community and nursing home settings?

This review is comprised of a synthesis of primary and a review of relevant conceptual frameworks for missed care

Identifying relevant studies

Key search terms will be developed on the basis of seminal publications

The following study types will be included:

- Randomised controlled trials (RCTs)
- Non-randomised controlled trials (NRCTs)
- Controlled before-after CBA (studies)
- Interrupted time series (ITS) and repeated measures studies

(Qualitative, economic evaluations and other forms of secondary analysis were added as study designs given the low yield of intervention studies identified by the reviewers).

Study selection criteria and quality assessment

Inclusion and exclusion criteria for the searches:

Inclusion criteria

- Topic: Missed care related safety outcomes
- Setting: primary care, community care (including nursing care in residential settings) (Reviewers must be able to distinguish relevant settings within findings)
- Study type: empirical published primary studies (see above)
- Population: no restriction (non-specific or specialist populations), all levels of nurses
- English language
- Countries included: UK, Ireland, USA, Canada, Australia, New Zealand
- Date parameter- none

Exclusion criteria

- Acute care settings
- Population- care aides in nursing home settings
- Publication type: Masters dissertations or thesis, systematic review, non-empirical publications
- Long-term care not linked to a community setting
- Materials not translated into English

(The conceptual review will include models from wider acute care settings)

Inclusion and exclusion criteria will be developed using the PICOC framework: population, intervention, comparator, outcome and context. A draft of the inclusion criteria using this framework follows below:

Condition or domain being studied:

Missed care related safety outcomes (including care left undone, unfinished or rationed). Causes and implications of missed care will be examined.

Outcomes

Population: adult patients in primary care or community care settings (including nursing homes) in comparable health service contexts: UK, Ireland, USA, Australia, Canada, New Zealand and the USA .

Interventions: Interventions relating to minimising or identifying missed care

Outcomes: Missed care outcomes (quantitative or qualitative). Including health-based, organisational, psycho-social or economic outcomes

Comparators: usual or current practice or care.

Contexts: Primary care, community care (including nursing care in residential settings)

We will exclude long-term care

Time span: No restriction

Study selection will be conducted in two stages. First, all titles and abstracts will be screened for relevance. A proportion will be double screened. Second, studies that meet detailed inclusion criteria will be obtained. Reasons for exclusion will be documented. General discussion / news articles with no empirical data or without substantial literature review will be excluded.

EndNote will be used to manage references.

Charting data

Descriptive examination across and within included studies.

Data extraction, (selection and coding)

A reviewer will sift all retrieved title and abstracts (downloaded into Excel). Another reviewer will double screening of a proportion of records. After a full text reading of potentially relevant papers against inclusion criteria, study characteristics will be extracted into Excel. Papers which were discussed where there was uncertainty about inclusion.

Risk of bias (quality assessment)

SURE and CASP

Summarising and reporting results (synthesis)

Narrative synthesis of study characteristics. Cross-study examination of key factors relating to missed care in relation to findings, context and perspective. Further exploration via a framework for assessing findings based on CERQUAL principles.

The theoretical and metric based examples were identified and appraised according to strengths and weaknesses. Empirical findings were then critically examined in light of the theoretical and metric papers identified.

Appendix 4 - Quality Assessments

SURE- Cross-sectional assessment	**Study:** Blackman et al 2015 **YES/NO/CAN'T TELL**	**Study:** Willis et al 2016 **YES/NO/CAN'T TELL**	**Study:** Phelan et al 2018a et al 2016 **YES/NO/CAN'T TELL**	**Study:** Henderson et al 2017 **YES/NO/CAN'T TELL**	**Study :** Nelson and Flynn 2014 **YES/NO/CAN'T TELL**
1. Is the study design clearly stated?	YES	YES	YES	YES	YES
2. Does the study address a clearly focused question? Consider: Population; Exposure (defined and accurately measured?); Outcomes.	YES	CAN'T TELL	YES	YES	YES
3. Are the setting, locations and relevant dates provided? Consider: recruitment period; exposure; data collection.	YES	YES	YES	YES	YES
4. Were participants fairly selected? Consider: eligibility criteria; sources & selection of participants.	CAN'T TELL	YES	YES	YES	YES
5. Are participant characteristics provided? Consider if: sufficient details; a table is included.	YES	YES	YES	NO	NO
6. Are the measures of exposures & outcomes appropriate? Consider if the methods of assessment are valid & reliable.	YES	YES	YES	YES	YES
7. Is there a description of how the study size was arrived	YES	YES	CAN'T TELL	YES	YES

at?					
8. Are the statistical methods well described? Consider: How missing data was handled; were potential sources of bias (confounding factors) considered/controlled for.	YES	YES	YES	YES	YES
9. Is information provided on participant eligibility? Consider if following provided: number potentially eligible, confirmed eligible, entered into study	YES	YES	YES	YES	YES
10. Are the results well described? Consider if: effect sizes, confidence intervals/standard deviations provided; the conclusions are the same in the abstract and the full text.	YES	YES	YES	YES	YES
11. Is any sponsorship/conflict of interest reported? ?	NO	NO	NO	NO	NO
12. Finally...Did the authors identify any limitations and, if so, are they captured above	NO	YES	YES	YES	YES
Summary Add comments relating to areas of concern that were avoidable and a statement indicating if the results are reliable and/or useful.	The results are limited and could be more detailed (fig. 5.1.) in respect of nursing home contexts	In-depth study but focus group perspectives not all relevant for this study	Results are reliable and useful. MISSCARE survey adapted appropriately. Low response rate unavoidable, missed data dealt with appropriately. Unstandardised role had unavoidable impact.	2 aspects of data reported	Sample criteria clear

CASP item	**Study:** Phelan et al 2016; 2018b **YES/NO/CAN'T TELL**	**Study:** Henderson et al 2016 **YES/NO/CAN'T TELL**
1. Was there a clear statement of the aims of the research?	YES	YES
2. Is a qualitative methodology appropriate?	YES	YES
3. Was the research design appropriate to address the aims of the research?	YES	YES
4. Was the recruitment strategy appropriate to the aims of the research?	CAN'T TELL	YES
5. Was the data collected in a way that addressed the research issue?	YES	YES
6. Has the relationship between researcher and participants been adequately considered?	CAN'T TELL	YES
7. Have ethical issues been taken into consideration?	YES	YES
8. Was the data analysis sufficiently rigorous?	YES	YES
9. Is there a clear statement of findings?	YES	YES
10. How valuable is the research?	Very High	High

Appendix 5 – Comparison of missed care items

Phelan et al 2016; 2018a & b – community context **Adapted MISSCARE survey**	**Willis et al 2016 – Aged care facilities** **Adapted MISSCARE survey**	**Henderson et al 2017- Residential aged care** **Adapted MISSCARE survey**	**Blackman et al report 2015 & Henderson et al 2016 residential aged care** **Adapted MISSCARE survey**	**Nelson and Flynn et al 2014– nursing homes for UT related m/c** **Developed new survey**
Home Nursing Care 3 items covering injections, promotion of skin integrity and health advice/ advocacy **Care Management** 6 items including assessments, liaising with other professionals and making referrals **Family Support** 2 items including support for families and for carers Older People 8 items including assessments, follow-ups, screening, management of elder abuse and at risk register **Health Promotion** 7 items relating to healthy eating, exercise, well-being, immunisation as well as provision of information about specific conditions **Disadvantaged Groups** 5 items relating to health promotion and advocacy work on behalf of vulnerable groups **Education** 2 items including supervision of nursing students and participation in CPD **Provision of Other Community Nursing**	**Behaviour** Intervening when residents' behaviour is inappropriate or unwelcome Intervening when residents say inappropriate or unwelcome things Intervening when residents are physically agitated Encouraging residents' social engagement Encouraging residents' participation in decisions about their care 2 Interacting with residents when they have problems with communication Identifying residents' underlying moods or social states Maximising residents' dignity Ensuring residents are not left alone when supervision is required Supporting residents to maintain their interests Providing residents with activities to improve their mental and physical functioning Providing emotional support for residents' and/or family and friends Activities of Daily Living Moving residents confined to bed or chair who cannot walk	**Types** Early shift Late shift Night shift Ambulation *3 or as ordered Turning patient 2 to 4 hourly Feeding patients while food is still warm Setting up meals for patient who feed themselves Medication administered within 30 min of scheduled time Vital signs assessed Monitoring intake/output. Full documentation Patient education Emotional support for patent and/or family Hygiene Mouth care Nurse hand washing Patient discharge planning Blood glucose monitoring Reassessment according to patient condition IV/central line care and assessment Response to call bells within 5 min	**Reason for missed aged nursing** care Item no. Reason for missed aged nursing care 1 Inadequate number of staff 10 Supplies/equipment NOT functioning properly when needed 2 Urgent patient situations (e.g. worsening patient condition) 11 Lack of back up support from team members 3 Unexpected rise in patient volume and/or acuity on the ward/Unit 12 Tension or communication breakdowns with other ANCILLARY/SUPPORT DEPARTMENTS 4 Inadequate number of assistive and/or clerical personnel (e.g. care assistants, ward clerks, porters) 13 Tension or communication breakdowns within the NURSING TEAM 5 Unbalanced patient assignment 14 Tension or communication breakdowns with the MEDICAL STAFF 6 Medications not available when needed	Frequency of missed care by type of care activity Missed care Activity Comfort/talk with patients Develop or update care plans Teach patients and/or families Document nursing care Adequate patient surveillance (direct observation and monitoring) Oral hygiene Skin care Coordinate patient care Perform necessary treatments and procedures Administer medications on time Prepare patients for discharge Pain management p.128

Services 5 items including nursing care and support in areas of palliative care, mental health and chronic disease management Primary Care Teams 2 items relating to the organisation of and attendance at PCT meetings and referrals to other PCT healthcare professionals **Administration** 4 items included the updating of client notes and files and report writing p.23	**Assisting residents with mobility** Assisting residents' toileting needs within 5 minutes of request Preparing residents for meal times ± Making sure residents are safe Assisting with residents' hygiene Assisting with residents' mouth care Ensuring own hand hygiene Assessing residents for healthy skin Responding to call bells within 5 minutes **Complex Health Care** Taking vital signs as ordered Monitoring residents' food and fluid intake Assessing and monitoring residents for presence of pain Full documentation of all care Providing wound care Providing stoma care Maintaining nasogastric or PEG tubes Providing catheter care Suctioning airways/tracheostomy care Measuring and monitoring residents' blood glucose levels Reassessing residents to see if their care needs have changed Maintaining IV or subcutaneous sites Ensuring PRN medication acts within 15 minutes Giving medications within 30 minutes of scheduled time Evaluating residents' responses to medication Providing end-of-life care in line with residents' wishes p.71-2	Prn medication requests within 15 min Assess effectiveness of medications Assist with toileting within 5 min Skin/wound care Table 1 p.414	15 Nursing Assistant/Carer did not communicate that care was provided 7 Inadequate handover from previous shift or patient transfer into ward/Unit 16 Nurse/Carer assigned to the patient off ward/Unit or unavailable 8 Other departments did not provide the care needed (e.g. physiotherapy did not ambulate) 17 Heavy admission and discharge activity 9 Supplies/equipment NOT available when needed 18 Not able to access a registered nurse in a timely manner OR registered nurse is NOT available Table 5.3 p.72 Blackman et al report 2015	

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