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Nurse experiences of medication administration to people with swallowing difficulties living in aged care facilities: a systematic review of qualitative evidence

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Executive summary

Background: Administering medicines to older people with swallowing difficulties is a challenging task. Nurses frequently modify oral medications e.g. by crushing/splitting tablets, or opening capsules, to facilitate the administration process. These practices are associated with an increased risk of medication administration errors. However, the reasons for these practices from nurses' perspective are not well understood.

Objectives: To identify nurses' experiences of administering oral medications to residents of aged care facilities (ACFs) with swallowing difficulties.

Inclusion Criteria: *Types of participants:* Nurses of any level with the responsibility of medication administration in ACFs.

Phenomena of interest: The review investigated studies about experiences of nurses in terms of problems and challenges they encounter when administering oral medicines to aged care residents with swallowing difficulties.

Context: ACFs providing all levels of care were considered for inclusion.

Types of studies: Qualitative studies including, but not limited to phenomenology, grounded theory, ethnography and action research designs as well as mixed methods studies and text and opinion papers were considered.

Search Strategy: A comprehensive database search of PubMed, CINAHL, Embase and Scopus was conducted between October and December 2016. Mednar and ProQuest Dissertations and Theses databases were used to search for grey literature. No date limitation was applied.

Methodological Quality: The Joanna Briggs Institute Qualitative Assessment and Review Instrument critical appraisal tool (JBI-QARI) was used to assess the quality of the papers.

Data Extraction: The JBI-QARI data extraction instrument was used to extract qualitative findings.

Data Synthesis: Data synthesis was not applicable in the final analysis due to the inclusion of one article.

Results: The initial search resulted in 1681 unique titles for screening. A total of 202 abstracts were screened, after which a full-text review conducted for 19 articles. After the full-text review, only one article was eligible to be included in the final report. The included study scored highly in terms of methodological quality. The findings highlighted issues around time constraints, complexity of medication administration process to residents of ACFs with swallowing difficulties, cost and resources for alternative strategies, inefficient information flow and communication among healthcare professionals, and nurses' knowledge and training needs.

Conclusion: The limited findings of this systematic review indicate that further research is necessary to provide evidence of nurses' experiences with regards to administering oral medications to older people with swallowing difficulties living in ACFs. A comprehensive understanding of these experiences may lead to organizational system changes to support nurses and older people with swallowing difficulties in ACFs.

Keywords: Aged care facilities; experience; medication administration; nurse; swallowing difficulties

Background

Dysphagia or 'swallowing difficulties' is a growing health concern impacting patients' health in different ways. Older people are particularly at risk of developing swallowing impairments due to age related physiologic changes, together with the increased risk of comorbidities causing swallowing problems e.g. stroke, dementia, Parkinson's disease.¹ Approximately 15% of community-dwelling older people experience swallowing difficulties.²⁻⁴ These figures increase significantly in the aged care setting where 53-68% of older people are affected by swallowing difficulties.⁵⁻⁸ Swallowing difficulties is associated with poor health outcomes such as malnutrition, dehydration, prolonged hospitalization and socio-psychological complications.⁹ In addition, patients with swallowing difficulties are three times more likely to experience complications such as aspiration pneumonia, and have six times greater risk of mortality.¹⁰

Patients with dysphagia may experience difficulty swallowing foods, drinks, or oral medications. The oral route of administration remains the most preferred method of drug delivery to patients due to its convenience, non-invasive nature and higher patient acceptability.¹¹ However, it can be a challenge for patients who experience difficulty with swallowing oral dosage forms.¹² Administering medicines to older patients with swallowing difficulties is also a challenging task for healthcare professionals as they have to overcome issues around patients' refusal to take medicines, face uncertainties in decision making for patients' treatment, and manage the time. These issues affect nurses in particular as they are the healthcare professionals who are commonly at frontline of administering medicines to patients.¹³

To facilitate the administration of oral medications to patients with swallowing difficulties healthcare professionals may resort to modifying medication dosage forms e.g. crushing tablets or opening capsules.¹⁴ Reportedly, such practices are being commonly used in aged care settings,¹⁵⁻¹⁷ where swallowing difficulties are prevalent. However, nearly one-third of the dosage form modification instances in ACFs are performed inappropriately,¹⁶ leading to an increased risk of medication administration errors.^{18, 19} In fact, aged care residents with swallowing difficulties are significantly more prone to medication administration errors compared to those without any swallowing problems.¹⁹ When performed inappropriately, the practices of dosage form modification are likely to result in negative health consequences for the patient e.g. decreased efficacy of medication, increased risk of drug toxicity and adverse effects.²⁰ These can eventually lead to patient harm, hospitalization, and poor treatment outcomes.²¹ Fatality incidents have also been reported in older people due to erroneous practices of dosage form modification.²² Such practices can also affect the administering person's health due to occupational exposure to the drug particles.¹⁶ In addition, these practices may make the administering person legally liable for any potential harm to patients arising from the modified dosage form,¹⁷ especially when the modification is unauthorized.

The issue of medication administration to aged care residents with swallowing difficulties is expected to grow as a result of a booming elderly population.²³ Thus, there is an urgent need to optimize the practices

of administering oral medications in older people particularly those with swallowing difficulties.²⁴ Nevertheless, little is known about the underlying factors leading to the sub-optimal practices related to administering oral medications to older patients with swallowing difficulties.

Existing reports in the literature have mentioned a range of problems surrounding medication administration to people with swallowing difficulties. A part of these issues can be attributed to organizational factors such as timing and staffing constraints.²⁵ These are compounded by inadequate equipment and resources, problems in data flow, and inefficient communication among healthcare professionals.²⁶⁻²⁹ Individual factors relating to healthcare staff e.g. variation in skills and educational/knowledge factors are also among potential factors which may negatively influence the medication administration practices.^{26, 30} Other challenges with respect to drug therapy of patients with swallowing difficulties are related to the wide spectrum of dysphagia manifestations and the perception of swallowing as a function for nutrition rather than something to be considered when administering medications.²⁸ The cost and availability of alternative formulations can sometimes be a barrier of optimal management of patients with swallowing difficulties.²⁸

To identify the barriers and facilitators of administering oral medicines to people with swallowing difficulties in ACFs, a systematic review of the available qualitative evidence was conducted. This systematic review aims to identify nurses' experiences of administering oral medications to residents of ACFs with swallowing difficulties. More specifically, it explores the experiences of aged care nursing staff about the problems and challenges of administering oral medicines to residents with swallowing difficulties. Systematic reviews are the strongest scientific tool as they enable researchers to compile multiple studies, with agreeing or conflicting results, and develop a generalizable/transferable conclusion.³¹ Understanding the experiences of nursing staff in ACFs with regards to administering oral medicines to aged care residents with swallowing difficulties will highlight opportunities to assist nursing staff when they administer medicines to people with swallowing difficulties.

In an attempt to find previous systematic reviews related to this review topic, a scoping search in three databases including the JBI Database of Systematic Reviews and Implementation Reports, the Cochrane Library, and PubMed was conducted. No systematic reviews were identified concerning the experiences of nurses about the problems and challenges of administering medicines to aged care residents with swallowing difficulties. There were two systematic reviews that discussed the issues around swallowing difficulties and medications. The first was a qualitative systematic review which explored the evidence around the opinions of a wide range of professionals e.g. doctors, nurses, pharmacists, speech and language therapists from different healthcare settings e.g. hospitals, primary care, ACFs as well as patients around the practices of dosage form modification.³² The review included seven studies: three studies were related to the opinions and beliefs of healthcare professionals while four studies investigated patients' perspectives around oral dosage form modification. The practice of dosage form modification

was linked to the swallowing problems. Four themes emerged after thematic synthesis. These included varying needs of each patient, lack of efficient communication, insufficient knowledge about dosage form modification practices, and the complexity of decision making to modify dosage forms, and healthcare environment.³² Another quantitative systematic review investigated the evidence around the prevalence of swallowing difficulties with oral medications and the rate of dosage form modifications among older adults aged 60 years or above.³³ Five studies were included. The review findings suggested approximately 14 % of older patients living in community experienced difficulty swallowing medicines, and in one quarter to one third of medication administration occasions to older people, medicines were modified prior to administration.³³

The objectives, inclusion criteria and methods of the review to be considered for the current review were previously specified and documented in a published protocol in the Joanna Briggs Institute (JBI) Database of Systematic Reviews and Implementation Reports.³⁴

Review question/objective

The objective of this review is to identify nurses' experiences of administering oral medications to residents of ACFs with swallowing difficulties. More specifically, the review question is: What problems do nurses experience when administering oral medicines to people with swallowing difficulties living in ACFs?

Inclusion criteria

Types of participants

Participants included nurses of any level with the responsibility of medication administration in ACFs e.g. registered nurse, enrolled nurse, and medication-endorsed nurse, assistant in nursing. However, since different terminologies might be used in different contexts or countries, equivalent terms were included as well.

Phenomena of interest

This review has considered studies that explore the experiences of nurses who administer oral medications to older people with swallowing difficulties in ACFs. More specifically, the review focused on the experiences of nurses in ACFs about the problems and challenges they face when administering oral medicines to aged care residents with swallowing difficulties.

The review included all residents of ACFs who have swallowing difficulties. Although the majority of

people living in ACFs are older adults i.e. 65 years of age or above, no age limitation was applied as there might be residents living in ACFs under the age of 65 years. Cases with enteral feeding tubes were also considered eligible for inclusion.

ACF in this review was defined as a residential aged care setting with any level of care from accommodation and personal care (also known as low care in some countries), to the accommodation, personal and 24-hour nursing care (also known as high care in some countries). However, this definition does not include the community services for older people who receive personal and nursing care in their own homes. Dysphagia or swallowing difficulties was defined as both clinically diagnosed dysphagia by a healthcare professional, and aged care residents' subjective and self-perceived swallowing difficulties.

Context

ACFs including all levels of care.

Types of studies

A study was eligible for inclusion in this systematic review if it reported on: (1) original qualitative research including, but not limited to, designs such as phenomenology, grounded theory, ethnography and action research and (2) mixed method studies in which qualitative findings e.g. narrative descriptions or quotes by nurse participants, were described separately and could be extracted from the text.

The inclusion of the studies was not restricted to the criterion of qualitative assessment being the main objective of the study. Therefore, those studies with a qualitative component on experiences and perspectives of nurses around medication administration to aged care residents with swallowing difficulties as an auxiliary report within the study, were also considered for inclusion.

Search strategy

A three-step search strategy was used in this review to cover both published and unpublished studies (grey literature). A limited search of PubMed and CINAHL was undertaken initially and the text words contained in the title and abstract and the index terms used to describe the articles were analyzed. The identified keywords and index terms in the first step were then used to undertake a second search across all included databases. The final step was performed by manually searching the reference lists and citation tracking of all identified articles.

Four major databases, PubMed, CINAHL, EMBASE and Scopus, were searched and all articles were retrieved. Additionally, a search in unpublished (grey) literature was conducted using Mednar and

ProQuest Dissertations and Theses databases. All databases were searched without applying a date restriction as it was unclear when the earliest research on this topic had become available. Databases were searched from 24 October to 3 December 2016. Because of time and resource constraints to translate and analyze articles published in a language other than English, only articles in English were included in the review. In order to ensure the best possible search strategy, the initial search strategy was developed with the consultation of an experienced librarian specialized in health databases. Different combinations of the keywords were examined to cover as much relevant articles as possible. The keywords used in database search are presented in Table 1.

Table 1. Database search keywords

Keyword	Similar terms
Dysphagia	Swallowing difficulties; swallowing impairment(s); deglutition disorder(s); swallowing disorder(s); swallowing
Medication administration	Drug administration; drug administration routes; oral administration; medication; oral medication; oral formulation
Older adults	Elderly; older adult(s); senior(s); geriatrics; aged
Aged care facilities	Nursing home(s); care home(s); residential home(s); residential aged care facilitie(s)
Nurse	Registered nurse; caregiver; nursing personnel

Results of each combination of search terms were compared against other combinations to ensure the selection of best search phrase. For three selected databases the reviewers decided to combine the results of two different search phrases as each phrase yielded a number of highly relevant articles that were not covered by the other search phrase. For some of the database searches, inclusion of all potential keywords was not possible since the combination of all keywords yielded a very limited number of articles often less than 5 results.

Specific search terms and phrases in each database are provided in Appendix I. Database search results are presented in Table 2.

Table 2. Search results of selected databases

Database	Date	Results
PubMed	02/12/2016	968
CINAHL	02/12/2016	460
EMBASE	03/12/2016	251
Scopus	03/12/2016	116
	Total	1795

Method of the review

Study records and selection process

After searching selected databases, all retrieved articles were exported into EndNote software (Version X7, Thomson Reuters UK). The initial database search, reference list search and citation tracking was performed by one of the authors (AF). After pooling the retrieved titles, all duplicates were removed. Two reviewers (AF and SW) screened the titles independently and the final list of potential titles was created by compiling the lists of the two reviewers. The same process was repeated during the abstract screening when each reviewer read the abstracts independently and the selected abstracts were merged. Authors of the primary studies were contacted when the full-text articles were not accessible. Discrepancies between the reviewers were resolved through comprehensive discussions to reach an agreement. Quantitative studies, review articles, meta-analyses or meta-syntheses, editorials, commentaries, letters, conference abstracts, studies with no available full-text and non-English studies were excluded.

Assessment of methodological quality

The full-text papers were read and the final retrieved paper was critically appraised for its methodological quality by two reviewers (AF and SW) independently. The quality of the interpretive and critical studies was assessed using The Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) prior to the inclusion in the final review (Appendix II).³⁵ This tool is a standardized critical appraisal instrument which is designed as a part of analytical modules of the JBI System for the Unified Management, Assessment and Review of Information (JBI-SUMARI) software.³⁶ This instrument provides a framework to score the quality of qualitative studies by addressing different aspects of the research such as ethical considerations, potential bias, integrity of the methodology, and congruity between methods, results and conclusion. Each appraisal item comes with four options of acceptance, rejection, not clear or not applicable.

Any discrepancy or disagreement between the two reviewers were resolved through discussions. Ethical approval was not sought for this review as no human subjects were involved.

Data extraction

The primary reviewer (AF) performed the data extraction and the second reviewer (SW) verified the extracted data for their accuracy and completeness. The standardized data extraction instrument of JBI-QARI was used to extract the data from qualitative studies (Appendix III).³⁶ Detailed information such as methodological approaches, study designs and settings, phenomena of interest, participant characteristics, methods of data analysis as well as the important findings for the purpose of the systematic review was extracted. Additional study characteristics such as country of origin, year and language of publication were also recorded.

To clarify the meaning, each extracted finding from the study was accompanied by a verbatim quote from the interview participants or the author's narrative (Appendix IV). In order to assign a level of credibility, the reviewers (AF and SW) evaluated each finding and agreed on a level of credibility for each item according to the JBI guidelines:

_ Unequivocal (U): Findings that were accompanied by illustrations that were beyond reasonable doubt and therefore not open to challenge.

_ Credible (C): Findings were accompanied by illustrations that lacked a clear association and were therefore open to challenge.

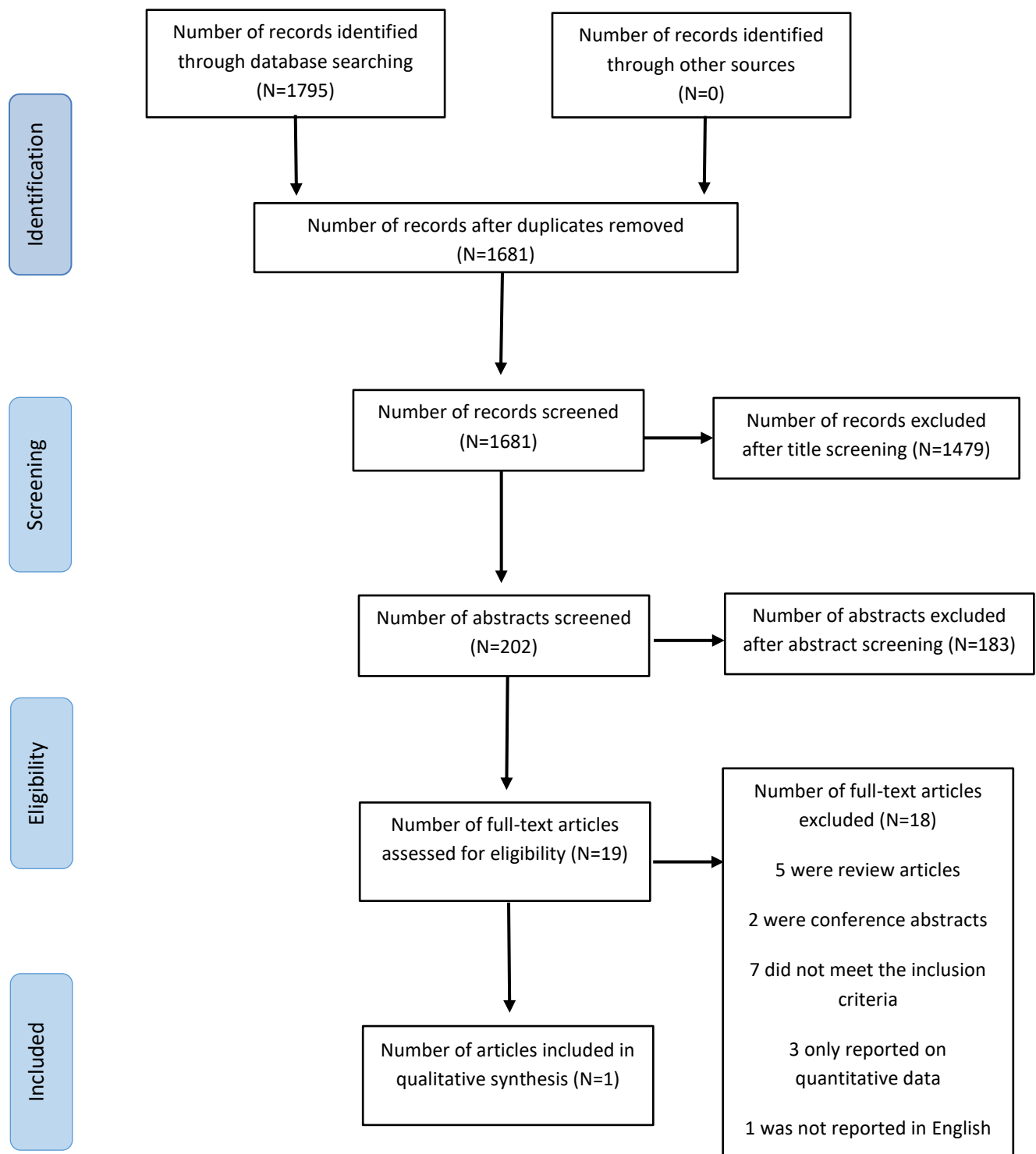
_ Unsupported (US): Findings not supported by data.

Data synthesis

The published protocol in the JBI Database of Systematic Reviews and Implementation Reports has outlined the strategies for data synthesis.³⁴ However, since only one study was eligible for the final review, data synthesis was not possible. Instead, it was decided that a narrative summary would be presented. In the absence of synthesized findings ConQual assessment, which is a measure of confidence for synthesized findings based on their dependability and credibility,³⁷ was not applicable.

Results

The initial search of the databases yielded 1795 titles. The summary of the utilized search phrases and the number of articles drawn from these search combinations have been presented in Appendix I. No additional studies were identified via the manual reference list search or citation tracking. After removing the duplicates, 1681 titles were obtained and screened. Of these, 202 were selected for abstract screen. Through abstract screen, 183 abstracts were deemed non-relevant or did not match the inclusion criteria and were therefore excluded. The remaining 19 articles underwent a full-text assessment, of which 18 were excluded because they did not meet the inclusion criteria. Five of those excluded were review articles, two were only abstracts, and seven articles did not meet the inclusion criteria in terms of setting or participants or phenomena of interest. Three papers only reported on quantitative data and one was in a language other than English. More than half of the excluded studies were published after 2010. Appendix V summarizes the reasons for exclusion of these articles. The complete process of study selection and search results are provided in Figure 1.³⁸



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(6): e1000097. doi:10.1371/journal.pmed1000097

Figure 1. Flow chart of study selection for the Systematic Review

Description of study

This systematic review identified only one qualitative study that satisfied the review's inclusion criteria. In this qualitative study, Barnes *et al.*²⁵ conducted semi-structured interviews among 11 registered nurses from a purposive sample of ACFs from different levels of care in Australia. This study was the third phase of a broader project which aimed to investigate the rationale, practice, and implications of the medication dose form modification. The interviews took place in the year 2000, with the article being published in 2006 in the *Journal of Advanced Nursing*. Registered nurses were interviewed about the problems and challenges related to the practices of medication dosage form modification when administering medicines to the aged care residents. The authors used a qualitative thematic analysis based on the approach by Ekman and Segesten.³⁹ It followed four steps of comprehensive reading of transcripts, building up themes and categories, identifying the recurrent patterns and developing findings. Characteristics of the included study have been presented in Appendix VI.

Methodological quality

Before the final inclusion of the retrieved study in the review, its methodological validity was assessed by two reviewers (AF and SW) independently. The standardized critical appraisal instrument from the JBI-QARI (Appendix II) was used for this purpose. The included study was of relatively high quality after being assessed by JBI-QARI³⁵ critical appraisal tool as shown in Table 3. The description of epistemology, methodology, and the methods of the study were clearly reported which support the transferability of the findings. The analysis used for the study was adequately described and was in line with the aim of the study. However, the effect of the researchers on the study and their theoretical and cultural position in the study context were unclear. Therefore, it was not possible to determine the level of dependability of the findings.

Table 3. Quality assessment of the included study using JBI-QARI

Quality assessment criteria	Barnes et al.
1. Is there congruity between the stated philosophical perspective and the research methodology?	Y
2. Is there congruity between the research methodology and the research question or objectives?	Y
3. Is there congruity between the research methodology and the methods used to collect data?	Y
4. Is there congruity between the research methodology and the representation	Y

and analysis of data?	
5. Is there congruity between the research methodology and interpretation of results?	Y
6. Is there a statement locating the researcher culturally and theoretically?	U
7. Is the influence of the researcher on the research, and vice-versa, addressed?	U
8. Are participants, and their voices, adequately represented?	Y
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Y
10. Do the conclusion drawn in the research report flow from the analysis, or interpretation, of the data?	Y
<hr/>	
Total score	8
<hr/>	

† Y yes N no U unclear

Findings of the review

The identified issues around the practices of medication administration and dosage form modification in residents of ACFs with swallowing difficulties were categorized under seven themes. These themes were labelled as “making sure residents get their medication, facing dilemma and uncertainty, inconsistency and contradiction, competing demands, time management, individualized needs, and cost/ availability of alternative formulations”.^{25(p193)}

Nurses often found themselves in situations where decision making for drug therapy of patients with swallowing difficulties was a challenge. This caused a confusion and uncertainty in their practice as they did not have sufficient access to appropriate guidelines or pharmaceutical references to guide their clinical decision making. Lack of formal communication procedures among nurses with other healthcare professionals further contributed to this uncertainty. Nurses also brought up their desire for further training on medication administration and dose form modification.

Details of the findings of this study and the direct illustrations from the nurses’ interviews together with their level of credibility have been provided in Appendix IV.

Discussion

This study was the first systematic review exploring the qualitative evidence around the experiences of nurses administering oral medicines to residents with swallowing difficulties in ACFs. After a comprehensive search strategy, only one study by Barnes *et al.*²⁵ satisfied the review’s inclusion criteria.

This study demonstrated a relatively high level of quality after being critically appraised, although a few aspects relating to the researcher's influence on the study were unclear.

The study revealed a number of challenges that nurses in ACFs face in their daily practices of administering medicines to residents with swallowing problems. Time constraints, issues around information flow and communication among healthcare professionals, lack of pharmaceutical references and guidelines, and the need for training among nurses were the key findings from this study.²⁵ Competing demands and complexity of the practice of medication administration to aged care residents was a challenge for nurses. Nurses commonly faced the conflicts in their professional duties, values, and ethical dilemmas. This is compounded when patients' individual needs and desires are in contrast with the relatives' wishes. As a result, nurses may be urged to make informed or uninformed decisions to overcome the complexity of the practice. Despite these inevitable challenges, nurses are not sufficiently supported with effective guides or practice frameworks to assist them with their decision making when administering medicines to aged care residents with swallowing difficulties. The nurses raised concerns around the lack of consistent education, and that the non-existence of a formalized communication system allowing interdisciplinary consultations added to their problem of uncertainty in practice. In order to resolve the ambiguities surrounding the practices of medication administration, nurses also need to be directed via predetermined guides and protocols to ensure quality use of medicines. This can be achieved by providing them with guidelines and references especially designed for the practices of medication administration in swallowing difficulties.

It should be noted that only nurses were included as the participants in this systematic review, because they are the healthcare professionals at frontline of administering medicines to patients.¹³ Therefore, any problems encountered in the administration phase can directly impact their practice. A number of articles representing the opinions and experiences of other healthcare professionals e.g. physicians, pharmacists were also identified through this systematic search.⁴⁰⁻⁴² However, these articles mainly centered around prescribing and dispensing issues rather than administration phase which most directly concerns nurses. To achieve a deeper understanding about the issues surrounding medication administration to people with swallowing difficulties, it would be beneficial for future studies to consider the perspectives of a diverse group of healthcare professionals involved in prescribing, dispensing, and administering medicines. This is important because prescribing and dispensing practices can also influence medication administration to patients with swallowing difficulties. Prescribers can play their role by enquiring about patients' swallowing abilities and avoiding to prescribe unsuitable medications or inappropriate techniques of administration. Dispensing healthcare professionals can prevent inappropriate practices by providing adequate information about the appropriate use of medications to patients and other healthcare professionals.

In terms of the study context, this review focused on ACFs because results from different studies consistently showed that more than half of the residents living in ACFs have some degree of swallowing

difficulties.⁵⁻⁸ The vulnerability of older patients in ACFs, higher rate of swallowing difficulties and dysphagia-related medication administration errors in aged care residents combined with the issues around polypharmacy supported the notion of focusing solely on ACFs. Furthermore, unlike nurses employed in hospital setting nurses in ACFs, especially those in remote areas may feel professionally isolated with little access to the support of other healthcare professionals. Future reviews may consider exploring nurse perspectives on the challenges of medication administration to older people with impaired swallowing in different contexts e.g. hospital setting, or home care services where nurses provide care to people in their own homes.

One of the limitations of this review is the inclusion of only one article. This may have arisen from the very specific inclusion criteria that limited the search only to nurses in aged-care facilities that led to the exclusion of articles with potentially pertinent findings. As a result, several studies which were conducted in other settings and among a range of healthcare professionals were excluded. Nevertheless, it was noticeable that the emerging issues in other healthcare settings such as hospital and community settings were similar to what was identified in this review e.g. the problems of using alternative formulations, the cost of alternatives, problems in communication and data flow and dilemmas and uncertainties.²⁸ These issues were brought up not only by nurses, but also by a diverse group of healthcare professionals such as physicians, pharmacists, speech pathologists and dietitians.^{40, 41} This may indicate that possible benefits of any measures addressing these issues will not be limited to nurses as medication administration is not independent from prescription and dispensing practices or patient monitoring and assessment performed by other healthcare professionals. Considering that the findings of this review have been derived from a reasonably good quality study, they can be transferable. This implies that similar findings may be applicable for other settings and individuals. However, further high quality evidence is still needed to support these findings. Supporting findings can describe barriers and facilitators of a framework of medication administration practices to people with swallowing difficulties. Moreover, the identified issues may be helpful in the design of practice improvement interventions in ACFs.

More than half of the excluded studies in this systematic review were published after 2010. It indicates that the issue of medication administration to patients with swallowing difficulties has started receiving more attention by researchers in recent years. Therefore, this topic is still relatively understudied and requires further research.

Overall, this systematic review highlighted the need for future qualitative studies on which future evidence-based practices may be based. More specifically, further studies are needed to explore the perspectives and experiences of nurses and other healthcare professionals on medication administration to patients with swallowing difficulties.

Conclusion

This systematic review revealed that qualitative evidence on experiences of nurses around the problems of medication administration to aged care residents with swallowing difficulties is scarce. Future well-designed qualitative research is needed for in-depth understanding of issues surrounding medicine administration to people with swallowing difficulties in ACFs.

Implications for practice

Drawing from the finding of the review, some recommendations can be made for clinical practice, although the evidence to support the recommendations is insufficient. These recommendations have been graded according to the JBI grades of recommendation (Appendix VII):

There is a need to reduce the ambiguity that surrounds the practices of oral medication administration to patients with swallowing difficulties in ACFs (Grade B).

The identified findings can inform the design of an intervention program or organizational system changes in medication management for residents in ACFs (Grade B).

Future interventions should focus on promoting communication, providing suitable pharmaceutical references and education in a cost-effective manner that reduces medication errors and optimizes the care of residents in ACFs (Grade B).

Implications for research

Paucity of quality evidence around the experiences of aged care nurses around medication administration in swallowing difficulties, as shown by this review, indicates that high-quality qualitative research needs to be carried out to further explore experiences and perceptions of nurses. Experiences and perceptions across different healthcare settings and among the multi-professional team e.g. nurses, physicians, pharmacists and speech pathologists should be studied.

Conflict of interest

The authors declare that they have no competing interests.

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Appendix I: Final search phrases used in selected databases

Database	Search phrase	Type of search	Final Search Date	Result
PubMed	((("Administration, Oral"[Mesh] OR ((drug OR medication OR medications OR medicine OR medicines) AND oral AND administration))) AND (elderly OR "older adult" OR geriatric)) AND (swallowing OR dysphagia OR swallow*)	Advanced	02/12/16	905
PubMed	"Medication administration" AND nurs* AND (residential OR "nursing home*")	Advanced	02/12/16	63
Embase	'dysphagia'/exp OR dysphagia OR 'swallow*' OR 'swallowing'/exp OR swallowing AND ('drug administration'/exp OR 'drug administration' OR (oral* AND administration*)) AND ('nurse'/exp OR nurse OR 'caregiver'/exp OR caregiver)	Advanced	03/12/16	142
Embase	'dysphagia'/exp OR dysphagia OR swallow* AND ('qualitative research'/exp OR 'qualitative research')	Advanced	03/12/16	109
CINAHL	((MH "Deglutition Disorders") OR (MH "Swallowing Therapy") OR swallowing) AND ((MH "Drug Administration+") OR (MH "Drug Administration Routes+") OR oral) AND (aged or elderly or senior or older)	Advanced	02/12/16	449
CINAHL	(dysphagia or swallowing disorders or deglutition disorders) AND (drug administration or medication administration OR oral medication) AND (older adults or elderly or seniors or geriatrics)	Advanced	02/12/16	11
Scopus	(ALL (dysphagia OR swallowing OR swallow*) AND ALL (drug W/2 administration OR medication W/2 administ*) AND ALL (old* OR elder*) AND ALL ("nursing home" OR "aged care facilit*"))	Advanced	03/12/16	116
			Total	1795

Appendix II: Appraisal instruments

QARI appraisal instrument

JBI QARI Critical Appraisal Checklist for Interpretive & Critical Research

Reviewer Date

Author Year Record Number

	Yes	No	Unclear	Not Applicable
1. Is there congruity between the stated philosophical perspective and the research methodology?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there congruity between the research methodology and the research question or objectives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Is there congruity between the research methodology and the methods used to collect data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is there congruity between the research methodology and the representation and analysis of data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there congruity between the research methodology and the interpretation of results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there a statement locating the researcher culturally or theoretically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is the influence of the researcher on the research, and vice-versa, addressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are participants, and their voices, adequately represented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info.

Comments (Including reason for exclusion)

Appendix III: Data extraction instruments

QARI data extraction instrument

JBI QARI Data Extraction Form for Interpretive & Critical Research

Reviewer Date

Author Year

Journal_ Record Number

Study Description

Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors Conclusions

Comments

Complete

Yes

No

Appendix IV: Extracted findings

Barnes L, Cheek J, Nation RL, Gilbert A, Paradiso L, Ballantyne A. Making sure the residents get their tablets: medication administration in care homes for older people. *J Adv Nurs.* 2006;56(2):190-9.

Findings	Illustration from publications (page number)	Evidence		
		Unequivocal (U)	Credible (C)	Unsupported (US)
making sure residents get their medication	"You're never too sure what and how much they're getting, or whether you're actually interfering with the strength of drugs by crushing and mixing them into the medium before you give it, and you're not too sure just ... how it is being received in the stomach." (p.193)	X		
Facing dilemma and uncertainty	"We have MIMS, we have the PP Guide, we have the PBS Manual as well ... they're unrelated to the particular topic we're discussing." (p.193)		X	
Inconsistency and contradiction	"I really don't think we get enough information about the drugs themselves...I don't think I know enough." (p.194) "Nurses tend to put their own interpretation on how things are done – governed by perhaps their social background in nursing, by their experience in nursing, by their academic experience in nursing." (p.194)		X	
Competing demands	"It's more than a medication round for me, it's an everything round." (p.194); In addition to administering medicines, aged care nurses have to manage multiple tasks in medication rounds as they have to answer telephone inquiries; direct care-workers; deal with residents' problems; attend to visiting medical officers; and manage staffing issues.		X	
Time management	"They won't take more tablets or another spoonful or I find that one spoonful's enough. They'll say 'that's it, I'm not taking any more'...I suppose you could go back later, but then your time's limited." (p.195)		X	
Individualized	"Some people are on 13 and 14 tablets at			

needs/wants	<p>once in the morning and we do crush them, it's a lot easier. And some people [who] can swallow whole tablets ... actually request to have them crushed because they find it difficult to swallow them all at once or one by one." (p.195);</p> <p>"There is of course the family ... [some] families tend to pill count and cost monitor and many of them prefer us to press on with the tablets and crush them rather than the [liquid] alternative which they prefer not to pay for.... [t]here have been occasions where we've disregarded the resident's request and favoured the family's insistence in relation to the crushing of medication." (p.195);</p>		X	
Cost/availability of alternative formulations	<p>"There have been occasions, like for a person with a gastrostomy that I've had to try and ensure that most of the medications were in liquid form to get down the tube. And many medications aren't made in liquid form ... then there's a problem where they're not on the 'free' and they're quite often much more expensive." (p.195);</p>	X		

Appendix V: Articles excluded from the systematic review after full text assessment

Year	Article	Reason for exclusion
2013	De Witt Jansen <i>et al.</i> ⁴³	This paper was published as a conference abstract. The nurses mentioned their concerns regarding medicines administration in dementia. Swallowing difficulties was a major problem in those with end-stage dementia. Nurses stated that effective communication with patients, families and other healthcare professionals was the most effective strategy to overcome the barriers of medicine administration to patients with dementia. However, there was no specific focus on patients with swallowing difficulties.
2003	Wright ⁴⁴	This paper was published as a review article.
2011	Kelly <i>et al.</i> ⁴⁵	This study was conducted in the hospital setting and was not a qualitative design. In this study the researchers reported the process of medicine administration by two different nurses to a patient with swallowing difficulties. The authors then performed a root cause analysis to find the possible reasons leading to the suboptimal medication administration practices by nurses.
2007	Vogelsmeier <i>et al.</i> ⁴⁶	The study investigated the barriers to safe medication administration in nursing homes through nursing interviews. However, no swallowing difficulties components were identified.
2014	Nund <i>et al.</i> ⁴⁷	The study did not meet the inclusion criteria in terms of participants, setting and the phenomena of interest. This was a qualitative study on the experiences of carers of people with head and neck cancer in relation to dysphagia. No medication related component was identified.
2016	Kappelle <i>et al.</i> ⁴⁸	This paper was published as a review article.
2014	Pergolizzi <i>et al.</i> ⁴¹	The study did not meet the inclusion criteria in terms of participants. In this study telephone interviews were conducted among physicians to get their opinions regarding the challenges they face when treating patients with chronic pain and swallowing difficulties. However, interview data were analyzed quantitatively.
2013	Guthrie <i>et al.</i> ⁴⁹	This paper was published as an abstract. Care staff were interviewed about the mealtime challenges of patients with swallowing difficulties with no mention of medication administration.
2008	Greener ⁵⁰	This paper was published as a review article.

2015	Stegmann ⁴²	This paper was an expert opinion from a pharmacologist and also did not meet the inclusion criteria in terms of the study setting. The author mentions a set of problems including lack of product information and compounding guidance, lack of instructions for patients with enteral feeding tubes as well as unavailability of alternative dosage forms. The legal dilemma of administering nurses was also mentioned by the author.
2006	Morris ⁵¹	This paper was published as a review article.
2011	Smith-Tamaray <i>et al.</i> ⁵²	This paper did not meet the inclusion criteria in terms of the setting. No medication administration component was identified as well.
2013	Stuijt <i>et al.</i> ⁵³	This study only reported on quantitative data.
2006	Griffith ⁵⁴	This paper was published as a review article.
2002	Wright ⁵⁵	This study only reported quantitative data on nurse experiences of using methods to overcome the problem of medicine administration to patients with swallowing difficulties and their opinions on shifting to liquid formulations.
2011	Chang <i>et al.</i> ⁵⁶	This study was published in Chinese.
2009	Kelly <i>et al.</i> ⁴⁰	The study setting was not identified in this article. This qualitative study was conducted as a focus group. Participants were consultant physicians, nurses, pharmacist and speech and language pathologists. Although no specific mention of the settings were made, some participant comments centered on hospital patients.
2008	Jackson <i>et al.</i> ²⁹	This study only reported on quantitative data. There was a mention on interviewing nurses about the problems that led to inappropriate medicine administration to patients with swallowing difficulties. However, these interviews only included questioning about the consistency of practice with speech and language pathologist recommendations.

Appendix VI: Characteristics of the included study

Authors	Country	Setting	Participants	Phenomenon of interest	Methods	Methodology	Data analysis	Findings
Barnes, Cheek, Nation, Gilbert, Paradiso, Ballantyne	Australia	Residential homes in South Australia	11 registered nurses	Exploring issues around nursing practice of dose form modification when administering medicines to older people in residential homes.	Semi-structured interviews	Phenomenological approach	Thematic analysis	Nurses in residential homes are faced with uncertainties around practice of altering medication dose forms. The lack of clinical guidelines, complexity of the process of medication administration, inadequate knowledge and communication contribute to the problem.

Appendix VII: JBI Grades of Recommendation



The JOANNA BRIGGS
INSTITUTE



THE UNIVERSITY
of ADELAIDE

School of Translational Health Science

New JBI Grades of Recommendation

Developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October 2013

JBI Grades of Recommendation	
Grade A	A 'strong' recommendation for a certain health management strategy where (1) it is clear that desirable effects outweigh undesirable effects of the strategy; (2) where there is evidence of adequate quality supporting its use; (3) there is a benefit or no impact on resource use, and (4) values, preferences and the patient experience have been taken into account.
Grade B	A 'weak' recommendation for a certain health management strategy where (1) desirable effects appear to outweigh undesirable effects of the strategy, although this is not as clear; (2) where there is evidence supporting its use, although this may not be of high quality; (3) there is a benefit, no impact or minimal impact on resource use, and (4) values, preferences and the patient experience may or may not have been taken into account.

The FAME (Feasibility, Appropriateness, Meaningfulness and Effectiveness) scale may help inform the wording and strength of a recommendation.

F – Feasibility; specifically:

- What is the cost effectiveness of the practice?
- Is the resource/practice available?
- Is there sufficient experience/levels of competency available?

A – Appropriateness; specifically:

- Is it culturally acceptable?
- Is it transferable/applicable to the majority of the population?
- Is it easily adaptable to a variety of circumstances?

M – Meaningfulness; specifically:

- Is it associated with positive experiences?
- Is it not associated with negative experiences?

E – Effectiveness; specifically:

- Was there a beneficial effect?
- Is it safe? (i.e. is there a lack of harm associated with the practice?)