Enteral Drug Administration:

Are challenges faced by home carers comparative to the experiences of nurses in other healthcare settings, and are these issues caused by a similar deficiency in knowledge of recommended best practice?
Synopsis (Abstract)

This assignment comprises of a research proposal on the topic of drug administration via enteral feeding tubes in the home care setting, examining the challenges experienced by home carers. The increasing number of patients being discharged with an enteral tube in situ over the last number of years has made this issue increasingly important and increasingly relevant to home carers in the community.

A literature review inclusive in this piece of work reveals that a wide variety of enteral drug errors are occurring in various acute care and intellectual disability settings. One such issue highlighted was the apparent existence of a theory-practice gap, whereby assessment of nursing knowledge regarding enteral drug administration did not reflect practice when evaluated by disguised observations. The most common drug error of the enteral route was that of discrepancies in the preparation method of medication to be delivered via enteral route. Some studies that were reviewed were based around implementing and evaluating interventions. Such programmes included nursing education by pharmacy staff which contributed to a noted decrease in drug errors post-implementation. This literature review concluded that the issue of frequently occurring drug errors of enteral administration traverses all healthcare settings not just acute care.

A qualitative descriptive study was proposed as there was little evidence to suggest that this research method had been widely used on this topic. There was no such study found by this researcher to suggest that the home care setting had been examined. Therefore, home carers who look after clients with enteral feeding tubes were put forward as suitable participants. Their experiences would be examined by means of hour long interviews using a specific framework of topics to guide questioning.
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Abstract: Aim of the study To describe the experiences and challenges of carers in the home care setting, who are required to administer medications to a client with enteral nutrition support. Study Design A qualitative descriptive design will be used for the purpose of this study. Sample Participants will consist of carers who administer enteral drugs to clients with enteral feeding tubes on a continual basis in the home care setting. Data saturation will be used as the method to define sample size. Study Setting This study will be carried out in participant’s homes in HSE South within the Republic of Ireland. Data Collection The study will consist of semi-structured interviews, participants interviewed once each. This interview process will last no longer than thirty minutes apiece. Data Analysis Thematic analysis will be used to interpret the data and further consultation of the available literature will contribute to the development of a hypothesis. Relevance to Practice A greater awareness of the issues and challenges of enteral drug administration faced by carers in the home setting not only has direct implications for dispensing practices in this community context, but also the acute care setting. This study will reflect the importance of changes to be made in terms of the provision of better nursing education and practice on the issue of enteral route drug administration.

Keywords: Enteral tubes; Drug Administration; Errors; Awareness; Practice
Introduction to Research Proposal

Findings by the British Artificial Nutrition Survey (Smith 2010) illustrate that there was an increasing number of patients discharged from acute care services with an enteral feeding tube in situ for home use, thus, it can be said there would be an ever-increasing risk of drug errors occurring in this setting. According to the American Society for Parenteral and Enteral Nutrition (ASPEN) guidelines (2009), enteral feeding is defined as a route of nutrition and drug administration involving a catheter that is placed directly into a section of the gastrointestinal tract, bypassing the oral cavity. However, in reviewing the literature, it was discovered that there is no research based evidence available to determine the number of drug errors occurring in the home setting. In an effort to address this research literature gap, a basic research study is proposed by this researcher, wherein “the term basic research refers to those studies that are designed to seek knowledge for its own sake” (Brockopp and Hastings-Tolsma 2003 p.88). The setting will be that of the home care context, where a sample of carers will be asked their opinion on a number of issues (explained in the Research Methods section). This qualitative descriptive study proposes to identify the experiences and challenges of enteral drug administration in this setting, of which the findings should compare similarly to that of research carried out in other sample contexts.

This study seeks to explore the following research questions: Are there comparable challenges experienced by home carers in enteral drug management as there are to nurses in other settings? Is there an obvious discrepancy between carers’ level of knowledge of enteral medications and associated administration recommendations?

The following literature review will illustrate the international research available on this topic and describe the issues relating to nurses in the context of acute wards and the intellectual disability setting.
Literature Review

Introduction

The aim of this literature review is to investigate pertinent research regarding nursing awareness, knowledge and practice that encompasses the issue of drug administration through enteral feeding catheters. Fletcher (2011) highlights its widespread use in patients who cannot sufficiently receive nutrition orally. For this reason, it is considerably relevant that research literature focusing on the topic is critically analysed. See appendix for evidence of the search strategy that was carried out to obtain the research articles contained in this literature review.

Analysing this literature can be justified by examining claims by both Jaffe and Walsh (2012) and Kelly and Wright (2009) that a nurse’s accountability can be called into question, occurring when patient harm arises as a result of medication administration errors associated with enteral therapy. Through critical analysis of the literature, these errors can be identified, while the causes and consequences of such actions can be explored, and methods of reducing these incidences investigated.

Both the Irish Society for Clinical Nutrition and Metabolism (An Bord Altranais 2007a) and the American Society for Parenteral and Enteral Nutrition (The National Guideline Clearing House 2009) agree on several guidelines for safe practice, including the concept that the enteral delivery of a liquid form of an oral medication is preferable to the generally inappropriate practice of crushing solid tablets, as it considerably reduces the risk of tube occlusion. However, according to research literature, these recommendations are not followed, emphasising the existence of a theory-knowledge gap in terms of drug administration via this route (Mota et al. 2010). Hence, the question that will seek to be answered in this review is: why is there such a significant gap between recommendations and practice?
Furthermore, Phillips and Nay (2008) carried out a literature review on this topic, discovering that the quality of research found on an international scale was minimal. This current review of the literature will be structured to comprise of five themes: a discussion of theory-practice gap, identification of the key drug error, evaluation of the effectiveness of intervention programs, analysis of issues concerning the multidisciplinary team as well as a description of the nursing perspectives.

**The Existence of a Theory-Practice Gap**

A small number of studies illustrate the existence of an evident theory-practice gap by presenting a contrast between healthcare professionals’ knowledge of medications and their corresponding dispensing practices via the enteral route. A survey by Phillips and Endacott (2011) used a random sample of acute care nurses in two Australian hospitals. The study’s quantitative approach involving the issuing of a questionnaire including questions related to tube flushing, correct positioning of the enteral feeding tube (EFT), and associated drug preparation methods. This method had previously been tested by means of a pilot study. Therefore, it was reliable in assessing each sample nurse’s level of understanding on the above topics. Its cumulative findings revealed an inconsistency between the sample’s knowledge of enteral drug practices and familiarity with best practice guidelines (Phillips & Endacott 2011).

What is more, this gap is also highlighted in a case-control interventional study by Dashti-Khavidaki *et al.* (2012), where the sample comprised of intensive care unit (ICU) nurses in two Iranian hospitals. This quantitative study compared the answers of a questionnaire, assessing the sample’s knowledge of drug administration via the enteral route, with the individual nurse’s practices that were witnessed under disguised observations. This observational technique means that findings are not distorted by the interference of the
observer on the dependent variable, that being the nurse’s practice (Uys and Basson 1991). The variation in results signifies this aforementioned theory-practice gap. The effects of interventions carried out in this study will be mentioned at a further stage in this review.

**Identifying the Key Drug Error in Enteral Feed Management**

There is unanimous agreement that the most fundamental drug error, in the area of enteral tube management, stems from inaccurate practices of medication preparation methods (Lonergan et al. 2009; van den Bemt et al. 2005; Idzinga, de Jong & van den Bemt 2009; Soares Barbosa et al. 2012; Phillips & Endacott 2011; Dashti-Khavidaki et al. 2012; Hanssens et al. 2006; Mota et al. 2010). Lonergan et al. (2009) carried out a prospective cross-sectional study on a sample of doctors and nurses in Trinity College teaching hospital in Ireland. Questionnaires were used to examine the sample’s knowledge of drugs that are appropriate and those inappropriate for enteral administration. The quantitative study found a prominent lack of awareness of contraindicated medications- 69.7% uninformed of contraindicated usage of modified-release medications and 49.7% to the contraindicated administration of enteric-coated drugs. However, reliability of such findings is questionable as convenience sampling was used to select the nursing and medical staff surveyed. Moreover, confidentiality was not maintained as the teaching hospital could easily be identified, due to the identification of the affiliated university in the paper.

Despite these limitations, findings by Dashti-Khavidaki et al. (2012) contributes to this theory by illustrating that more than half of the sample in their survey had an inadequate understanding of the properties of solid form drugs and, furthermore, did not have sufficient knowledge regarding the steps to follow when dispensing medication through EFCs. This experimental study by Dashti-Khavidaki et al. (2012) involved an intervention to increase
awareness of best practice with regards to this topic, of which will be discussed in the next section, along with other studies with a similar aim.

**The Effectiveness of Interventions in Reducing Frequency of Drug Errors**

On review of the literature, it is evident that a number of researchers adopt a before-after interventional study to determine the efficacy of initiatives implemented in various health settings aimed at improving staff drug administration knowledge and practices in relation to EFCs. (Idzinga *et al.* 2009; Hanssens *et al.* 2006; Dashti-Khavidaki *et al.* 2012; van den Bemt *et al.* 2005).

When comparing the aforementioned authors that follow this interventional design in their observational studies, it is Dashti-Khavidaki *et al.* (2012) that succeeds in establishing the most reliable findings due the inclusion of a control sample group in their quantitative study. An educational programme, directed by pharmacy staff, was implemented to the case sample of nurses. In contrast, the control sample of nurses did not receive any educational classes. By means of disguised observations, this experimental study ascertained that while there was little change within the variables of the control group, there was a marked decrease in the frequency of drug errors among the case group from 43% in the pre-test phase to 27% in the post-test phase.

Studies by van den Bemt *et al.* (2005) and Hanssens *et al.* (2006) are similar as they also implemented an interventional scheme in the acute care setting. A more holistic approach was adopted by van den Bemt *et al.* (2005) as the quantitative study’s educational programme was performed by a specifically appointed multidisciplinary team that included a senior staff nurse, a pharmacist and a dietician. This quasi-experimental study was carried out in two Dutch hospitals, evaluating outcome measures pre and post implementation of an integrated
program on a sample of nurses in the selected wards of these two hospitals. Results revealed the success of the intervention, due to the finding in one hospital of a reduction in frequency of tablet crushing from 27% to 3% in the pre and post phase respectively (van den Bemt et al. 2005). Hanssens et al. (2006) carried out a similar quasi-experimental observational study in six different ICU settings in a hospital in the State of Quatar. A training programme was initiated from the findings of a questionnaire. Results indicated an increase in knowledge of tablet crushing best practices from 35% to 90% in staff nurses (Hanssens et al. 2006).

In contrast to the samples used in the above studies, an observational prospective study by Idzinga et al. (2009) was carried out in an intellectual disability (ID) environment in The Netherlands. The study involved a sample of patients with enteral nutrition support, measured by way of disguised observations, to investigate nursing drug practices pre and post-intervention. Comparable to the above initiatives, this intervention for nursing staff involved the implementation of a training programme and provision of pharmacy advice, as well as the establishment of an enteral drug-specific box containing appropriate material for administration. The quantitative study’s results illustrate a decrease in enteral medication errors from 64.5% to 30.1%, proving that this acute care interventional design transitions effectively to the ID setting (Idzinga et al. 2009).

**Issues Surrounding the wider Multidisciplinary Team**

As previously mentioned, pharmacists play a pivotal role in the multidisciplinary team in increasing the knowledge of both medical and nursing staff and reducing the incidences of drug errors associated with enteral dispensing practices. However, Heineck et al. (2009) argues that this promotion of interdisciplinary communication is ineffective in minimising suggested risks unless pharmacy staff are adequately educated of the correct dosage forms,
effective methods of administration and accurate knowledge of contraindicative practices. This study was carried out in a Brazilian hospital where the frequency of enteral tube replacements were investigated through the inspection of a random sample of patient records (Heineck et al. 2009). Similarly, Idzinga et al. (2009) ascertains that such communication barriers do exist. The study’s findings suggest that although the abovementioned intervention was successful in reducing drug errors, little impact was made on the practice of ‘wrong preparation error’ which only reduced by 5% after subsequent completion of the program. The inference made by these researchers was that a lack of sufficient pharmaceutical advice was provided by the pharmacy team, or alternately, a lack of adherence by nursing staff was practised (Idzinga et al. 2009).

Educational focus must be turned to that of the prescribing medical professionals according to a recommendation by Soares Barbosa et al. (2012) in their quantitative study. These researchers examined the medical charts of all patients with enteral nutrition support in a Brazilian teaching hospital. Their findings illustrated that 21.8% of patients with artificial feeds in situ were unnecessarily prescribed the oral form of their medications. Interestingly, this study also found that 72.7% of these patients also received drugs via the intravenous (IV) route. This presents the argument that if IV access is established in the patient, existing prescribed drugs for enteral administration could possibly be prescribed by this alternatively therapeutic route for optimal drug delivery. Consequently, this would reduce patient harm from potential side effects caused by malpractice of enteral drug administration (Soares Barbosa et al. 2012). Although ethical approval was granted and these findings appear to contain validity, this study retained minimal confidentiality as the name of the hospital was disclosed.
Nursing Perspective of Issues to a Collaborative Approach

In terms of the nurses’ position on this matter, the question must be asked: Are drug errors caused by the nurse’s inappropriate deviation from the physician’s prescription or is it due to compliance with the prescriber’s inaccurate administration instructions? Barnes et al. (2006) in their qualitative exploratory study used purposive sampling to interview nurses in ten residential care homes in Australia. Their findings put forward the argument that the concept of safe drug administration is inhibited by professional constraints and interdisciplinary communication barriers. However, the validity of this line of reasoning is potentially questionable as there was a six year gap between data collection and publishing of this paper (Barnes et al. 2006).

In contrast, Mota et al. (2010) suggests that limited knowledge is a contributory factor to drug errors. This quantitative study, surveying ICU nurses in a Brazilian hospital, showed by means of a questionnaire that 34.7% of nurses did not stringently follow the recommended dosage drug form, due to the belief that their action would not negatively impact on the medication’s therapeutic effect. This concept is confirmed by Phillips and Endacott (2011) who revealed that convenience is the reason for 25.7% of the sample reporting the practice of administrating solid form drug enterally, despite the availability of the liquid form equivalent. Therefore, in answering the above question, it is evident that drug errors occur as a result of a combination of unresolved issues, that being a breakdown in interdisciplinary communication, the existence of professional constraints, limitations in knowledge, lack of awareness of adverse drug effects, and noncompliance to prescriptions.
Conclusion

Studies analysed in this literature review identified errors of enteral drug administration and clarified the reasons behind such malpractice, while some also illustrated the effectiveness of educational programmes (van den Bemt et al. 2005; Idzinga et al. 2009; Soares Barbosa et al. 2012; Phillips & Endacott 2011; Dashti-Khavidaki et al. 2012; Hanssens et al. 2006; Heineck et al. 2009; Mota et al. 2010; Barnes et al. 2006; Lonergan et al. 2009).

A number of recommendations have been made by the above researchers. Van den Bemt et al. (2005) advocates that nursing overreliance on the practice of drug crushing must be addressed. Additionally, Soares Barbosa et al. (2012) suggests that a greater emphasis be put on the supportive role of pharmacy staff in terms of promoting knowledge on the use of correct dosage forms and assisting in recognising the potential occurrences of drug errors.

Furthermore, Mota et al. (2010) and Lonergan et al. (2009) underline the necessity to standardise guidelines and protocols in the acute and community care settings, while Dashti-Khavidaki et al. (2012) emphasises the need for promoting education on enteral drug management in academic nursing training on an international scale.

An absence of qualitative research is particularly evident, with the exception of a study carried out by Barnes et al. (2006). Despite illustrating the successful transition of an acute care interventional design to an ID context (Idzinga et al. 2009), the researcher of this review found no evidence to suggest that research had been carried out in the home care setting.
Research Methods

Introduction. This section comprises of an outline of the research methods that will be used to conduct a study on the topic area of enteral drug administration under the following headings: Study Aim and Objectives; Research Approach; Study Sample, Access and Recruitment; Study Design; Methods of Data Collection and Data Analysis; Trustworthiness; Ethical Considerations; Potential Limitations.

Study Aim and Objectives. The aim of this qualitative descriptive study will be to describe and summarise the experiences of carers, in the home care setting, who are required to administer medications to their respective client via an enteral feeding catheter. This study’s objective will be to identify the areas in which difficulties and challenges arise within these dispensing practices.

Research Approach. Qualitative will be selected as a means of the study’s research approach. The home care setting necessitates a generally small sample size which contrasts with what is typically adopted for quantitative studies. Carr (1994) highlights that the researcher is more likely to form an amicable relationship with the participant, which would contribute to a greater in depth description of their experiences and challenges.

Study Sample, Access and Recruitment. Purposive sampling will be used to choose the appropriate home carers with this selection based on the following inclusion criteria: those who are willing to take part in the study; who live within the healthcare jurisdiction of the HSE South, Republic of Ireland; and who administer enteral medications to their client with enteral nutrition support on a continual basis. Recruitment of this sample will be obtained by means of permission by the Director of Public Health Nursing to grant access to contact details of those within the inclusion criteria. A letter will be sent to each of these carers explaining the importance of the research and details surrounding the study and what it would
entail. Data saturation will be the method to define the sample size to ensure that the researcher does not miss out any important details or acquires too much repeated details.

**Study Design.** A qualitative descriptive design will be applied to this study. This design prevails over other qualitative methods as it will obtain detailed descriptions of home carers experiences appropriate to their administration practices of enteral drugs. Neither ethnographic or grounded theory designs would pertain to this study as the setting is neither culturally relevant nor the data collection method involve observations.

**Method of Data Collection.** Semi-structured interviews will be used as the form of data collection which, according to Polkinghorne (2005), is the most common method in qualitative research. With participant consent, these face-to-face interviews will take place in the carer’s own home and will last approximately an hour in duration. The researcher has adapted the themes used from a study by Dashti-Khavidaki et al. (2012), to use as a guide for interview questions:

- Methods of drug preparation.
- Maintenance of tube patency.
- Knowledge of possible adverse effects.
- Knowledge of contraindicated medications.

**Method of Data Analysis.** Thematic analysis will be used by the researcher to dissect and categorise the recorded data into the relevant themes (mentioned above) for interpretation. Subsequently, the researcher will consult with current research literature available on enteral medication to clarify and expand upon the extracted findings furthermore to draw conclusions and attempt to answer the research question.
**Trustworthiness.** The study will establish credibility by using the thematic approach originally developed by Dashti-Khavidaki *et al.* (2012) to ascertain details on several different issues concerning enteral drug administration. With regard to confirmability, audio recording of the interviews will be used to accurately retain data for analysis.

**Ethical Considerations.** This study will obtain ethical approval from the Research Ethics Committee (*area removed for anonymity*). The researcher recognises the importance of upholding the ethical principles relevant to this study design that being respect for Autonomy, Beneficence, Veracity, Fidelity and Confidentiality (An Bord Altranais 2007b). Moreover, the researcher will ensure that informed consent is obtained before commencing the interviews.

**Potential Limitations.** Generalisations cannot be made on the topic as the interview design limits the number of participants in the study sample (Farrelly 2013). The lack of random selection of participants due to non probability sampling may result in lack of representation of the general population, therefore, an increased level of bias. Another limitation may arise if an inexperienced interviewer fails to guide the participant in answering the questions appropriately (Doody and Noonan 2013).
Summary

In summary, on review of the literature it is clear that a theory-practice gap exists among healthcare professionals regarding the inconsistencies between inappropriate techniques of enteral drug delivery and best practice guidelines available on this subject. Inaccurate drug preparation methods were found in the literature to be the most widely found cause of drug errors associated with the enteral route. The implementation of an educational programme in several studies proved to be successful in achieving a reduction in drug errors by enhancing awareness and knowledge. Drawing attention to issues within the multidisciplinary team, the need for a more collaborative approach was highlighted as an area that needs to be addressed.

On another note, the study proposed by this researcher sets out to achieve awareness of similar issues in the home care setting by voicing the opinion of a sample of home carers who administer drugs to clients with an enteral feed in situ.

Conclusion

Identification of the challenges experienced by home carers by means of this proposed study will raise the awareness of healthcare workers and relevant policy makers by pointing out that this issue traverses a number of healthcare settings. As mentioned in the literature review, there is an increasing need for policies to be put in place as well as addressing academic programmes.

Educating not only nursing staff but the MDT as a whole should improve outcomes of patients with EFTs, as there will be a reduced risk of adverse effects related to malpractice of drug administration via the enteral route.
References


Appendix: Search Strategy

An extensive database search was carried out to review national and international literature relating to the safe nursing practice of enteral drug administration. The electronic databases of CINAHL, PubMed and Science Direct were accessed. Articles were limited to those published between October 2003 and October 2013, and in the language of English. As Science Direct is a huge database covering a wide range of professions, the category of Nursing and Health Professions was also used to limit the number of results when this database was searched.

The key terms used were divided into three concepts. These concepts, along with the obtained results, are displayed in table 1.1 below.

Table 1.1 Search results

<table>
<thead>
<tr>
<th>Electronic Database</th>
<th>Search results for Concept 1</th>
<th>Search results for Concept 2</th>
<th>Search results for Concept 3</th>
<th>Search results for Concept 1+2</th>
<th>Search results for Concept 1+2+3</th>
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<td>CINAHL</td>
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<td>Science Direct</td>
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<td>8,805</td>
<td>56,093</td>
<td>1,830</td>
</tr>
</tbody>
</table>

- **Concept 1** = enteral feed* OR artificial feed* OR tube feed*
- **Concept 2** = medication OR medicine OR drug OR pharmacological AND administration OR therapy
- **Concept 3** = nurses*AND practice OR management OR intervention* OR knowledge OR problem* OR error*
As shown from the above table, the search of CINAHL database using the combined three concepts produced 245 results, the number of articles generated from PubMed was 75, and Science Direct was 1,830.

After these searches were completed, all articles were evaluated in order to refine the number of sources to be examined in the literature review. Inclusion criteria comprised of articles with primary research findings, and articles that are specifically relevant to the topic of drug administration practices via the enteral route.

Hence, 5 articles were taken from CINAHL database and 5 from PubMed. Cross examination for repetition deduced just 5 different papers for review from these databases.

Additionally, 1 article that was not evident in the above two databases was extracted from Science Direct, and 4 more literature papers were handsearched by perusing the reference lists of the abovementioned articles.

Therefore, the total number of research based articles analysed in the literature review will be 10.