Scandinavian Journal of
Caring Sciences
EMPIRICAL STUDIES
doi: 10.1111/scs.12451

Visiting nurses' posthospital medication management in home health care: an ethnographic study

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Scand J Caring Sci; 2017

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Background: Medication management is the most challenging component of a successful transition from hospital to home, a challenge of growing complexity as the number of older persons living with chronic conditions grows, along with increasingly specialised and accelerated hospital treatment plans. Thus, many patients are discharged with complex medication regimen instructions, accentuating the risk of medication errors that may cause readmission, adverse drug events and a need for further health care.
Aim: The aim of this study was to explore visiting nurses' medication management in home health care after hospital discharge and to identify key elements in patient medication for improved patient safety.
Method: Inspired by the ethnographic research cycle, participant observations and informal interviews were conducted at 12 initial visits by a nurse in a patient's home after hospital discharge. Data consisted of field notes and photographs from the patients' homes, medication lists and medical records. Field notes were analysed in four steps.
Findings: The analysis showed 12 stages in medication management in which nurses strove to adjust medication management to the patients' actual health status by *mediating* on knowledge of the patient, information to the patient and on rules and regulations and by *establishing order* in medication lists and medications in the home.
Conclusion: The nurse–patient relationship, the integration of care and the context of care challenged patient safety in visiting nurses' medication management in patients' homes after hospital discharge. The implications for practice were the following: to ensure nurses' opportunities to continuously evolve their observation skills and skills in making sound clinical judgements; to establish interprofessional working processes which support the continuous assessment of patients' needs and the adjustment of care and treatment; to clarify expectations to nurses' responsibility and patients' privacy.

Keywords: visiting nurses, home health care, medication management, home care patients, posthospital, patient safety, participant observations.

Submitted 28 June 2016, Accepted 22 January 2017

Introduction

The complexity of medication management in home health care is growing, partly because of an increasingly aged population with chronic health conditions, partly because of innovative treatment possibilities and more specialised and accelerated hospital treatment plans (1–3). Consequently, many patients are discharged with complex medication regimen instructions (4), leading to the severe risk of medication errors, potentially causing readmission, adverse drug events and the need for further health care (5–8). This study explored visiting nurses' medication management following the patients' discharge from hospital and identified key elements in patient medication.

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Background

Medication management has been identified as the most challenging component of hospital-to-home transitions (4, 6, 8). In a study of nurse-identified medication discrepancies during such transfers, Corbett et al. (7) found one or more discrepancies with 94% of the patients. The most common were the absence of a prescribed medication in the home, the inclusion of a discontinued medication and an incorrect dosage or frequency, similar to discrepancies found in Danish studies (9, 10). Moreover,

significantly higher rehospitalisation rates were found among patients with identified medication discrepancies after hospital discharge (8, 11). Of the reported adverse events in Denmark in 2013, 66% involved mismanagement of medication in home health care (12), a strong indication that medication management was a noteworthy cause of concern regarding patients' well-being and the prioritisation of health economics.

Patients with multiple chronic conditions or cognitive impairment were particularly vulnerable to medication errors (1, 13). A majority (85.9%) of patients receiving postdischarge transitional home care were in polypharmacy (5–9 drugs) or hyperpolypharmacy (>10 drugs) (13). Patients with complex medication regimens (>6 drugs per day or 12 doses per day) or with irregular medication schedules were particularly at risk (1). Older persons commonly received high-alert medications that, if incorrectly administered, might cause bleedings, falls, stroke, angina pectoris, heart failure or unconsciousness (14–16).

In their study of general practitioners' (GPs) and district nurses' home visits after hospital discharge, Rytter et al. (17) found reduced readmission rates and improved adherence to GPs' prescriptions in the intervention group. This finding corroborated other studies of medication management in transitional care interventions. For instance, Thomsen and Lindhardt (10) studied nurse-led coordination between hospital and home. The trial involved the reconciliation of medication between a geriatric physician and the nurse at a postdischarge home visit. Discrepancies after discharge (incorrect prescription, no prescription, uncommunicated changes and undelivered medications) were found in one of every three cases. The authors identified the need for systematic reconciliation and follow-up on medication regimens. In a study of the effect of visiting nurses' telephone follow-up versus home visits, Bruning found (18) the latter solved 62% more discrepancies. In another study of patients receiving consultation by a nurse case manager, Setter (4) found significantly fewer rehospitalisations, physician visits and better resolution of medication discrepancies in the intervention group. Furthermore, patients' self-management was emphasised in a number of studies of transitional care, and in Setter and Corbett's (7, 9) five-item list of successful transitions, four items concerned teaching and thus aimed at supporting patient self-management. Their admonition to 'simplify home drug regimens and correct discrepancies' was a salient concern in visiting nurses' management of medications for patients after hospital discharge. Hence, it was well documented that patients' health status was improved through health professionals' assistance, preferably in home visits (4, 19).

In summary, medication problems in patient transitions from hospital to home were evident, thus placing patients at the risk of adverse drug events. The problems increased as the number of home care patients in polypharmacy and hyperpolypharmacy rose (13), which led to a corresponding increase in the number of registered adverse events (12) and increased time spent in home health care (13, 20). Suggested solutions from Danish health authorities comprised the detailed regulation of medication management in home health care (21–23), a three-phased medication process, consisting of prescribing, dispensing and administration and, lastly, outlining checklists for proper medication management. Clearly, home visits by Registered Nurses helped disambiguate medication discrepancies and reduced rehospitalisation rates and physician visits (4, 19), but the nature of visiting nurses' home visits was itself unexplored and, importantly, might depend on the specific context of the visit. There was a growing awareness of the impact of the context on nursing interventions (24) and the need for developing interventions adjusted to specific contexts (25, 26). For example, the Fundamentals of Care framework (FOC framework) was the result of the work of an international group in the nursing field focusing on the fundamental aspects of patient care. This framework consisted of three different levels, depicted in circles, with the core relationship between the patient and the nurse at the centre. The second level (circle) showed the integration of care, and the third level, the outer circle, represented the interdependence of the nurse–patient relationship with the system and political level of the healthcare system. In short, the FOC framework encapsulated the influence of the context on nursing interventions (24). Thus, an exploration of visiting nurses' medication management in patients' homes after hospital discharge would disclose key elements for patient safety and healthcare costs and provide an opportunity for the subsequent improvement of nursing interventions. Hence, the aim of this study was to explore visiting nurses' medication management in patients' homes after hospital discharge and to identify key elements in patient medication for improved patient safety.

Materials and methods

As visiting nurses' medication management in patients' homes was a context-specific social situation, the authors chose an ethnographic methodology using the method of participant observation, inspired by Spradley (27). Participant observation was useful in conducting strategic- and topic-oriented research in collaboration with informants revealing urgent research topics (27).

Context

The study was conducted in the Visiting Nurses' Department in a Danish municipality of approximately 200 000 inhabitants. Municipal authorities were charged with

offering free visiting nurse care to patients with complex care needs (28, 29). In the studied municipality, on average, ten persons per day were discharged from hospital to further visiting nurse assistance in the home. At the initial visit, the visiting nurse (Registered Nurse) dispensed medications for 2–4 weeks, according to the physicians' prescriptions, while the daily administration of medications was performed by nursing assistants (2-year education).

Participants

Ten Registered Nurses, aged from 38 to 57, participated. They had worked as visiting nurses from three to 15 years, and their clinical experience ranged from four to 34 years. No restrictions were applied to patients' health conditions or ages, which ranged from 77 to 88 years. Ten of the twelve patients lived alone, two with a relative. Some patients had multiple conditions. They had been discharged after treatment for cancer (four patients), orthopaedic surgery (three patients) and apoplexy (two patients), and four suffered from dementia. Polypharmacy and hyperpolypharmacy were commonalities; all of the patients were prescribed more than five drugs per day and half of them more than ten. Eight patients received up to five different high-alert medications. The first author's (hereinafter MGK) earlier vocation as a visiting nurse in a different municipality balanced the insider–outsider position (27) and required the awareness of preunderstanding: as insider by enabling the initial contact to the visiting nurses, as outsider by asking questions and learning from the visiting nurses.

Data collection and analysis

The ethnographic research cycle (27) involved asking questions, collecting and analysing data, concurrent and iterative processes of participant observation in the Visiting Nurses' Department over a period of 4 weeks. Despite the circular pattern, for clarity we present the process in 10 linear steps in Table 1.

Ethical considerations

The study was approved by the Danish Data Protection Agency (Journ.nr. 2015-55-0585). The municipal charge nurse acted as a gatekeeper. Visiting nurses participated voluntarily, after giving their written, informed consent (30). Asked by the nurse, all of the patients accepted the observer's presence in the home in regard to the principle of autonomy (30). All of the patients received oral

Table 1 Data collection and analysis

Step	*Explanation*
1. Social situation: Visiting nurses' initial visit in the patients' homes after hospital discharge	Activity: Medication management Actors: Visiting nurse, patient, observer Place: The patient's home
2. Participant observations of 12 social situations during steps 4–10	Observational questions guided passive observations from a learners' perspective Oral questions put to the nurses served as informal interviews
3. Ethnographic record during steps 4–10	Data: Handwritten field notes expanded with medication lists, medical records and photographs
4. Descriptive observations at initial visits 1 and 2	Guided by open-minded questions, such as, 'What is going on at the visit?'
5. Domain analysis of field notes by searching for semantic relationships	Semantic relationships consisted of cover terms and included terms. For instance, the initial visit (a cover term) consisted of different stages (included terms) comprising the domain *Stages of the initial visit* Examples of other domains were *Attributes of the homes* and *Kinds of collaboration* Of the resulting 51 overlapping domains, two, *Ways to mediate* and *Ways to establish order*, were chosen for further analysis because they encompassed other domains and because of their importance for the aim of the study
6. Focused observations added at initial visits 3–6	Guided by structural questions such as, 'How do the nurses mediate?'
7. Taxonomic analysis of field notes by hierarchically organising of the data	For example, *Ways to mediate* was organised in mediating before, during and after the initial visit
8. Selective observations added at initial visits 7–12	Guided by contrast questions such as, 'How does mediating differ?'
9. Componential analysis of field notes	Further exploration of the data through contrast questioning, such as, 'What views are taken into consideration in mediating?'
10. Theme analysis describing both broader features and minor details of the social situation	The organising domain *Stages of the initial visit* described the broader features *Mediating* and *Establishing order* described important details for patient safety in medication management in patients' homes after hospital discharge Photographs, medication lists and medical records supplemented and illustrated the findings

information, varying from the brief 'We are studying medication management' to more detailed information adjusted to the patients' wishes and conditions. The observations focused on nurses' actions and the observer did not interfere in patient care during the visit in keeping with the principle of doing no harm (30). The data were anonymised before analysis.

Findings

The analysis revealed 12 stages in medication management in the patients' homes. The stage headings were the following: preparing visit at office (Stage 1), arrival at home (Stage 2), entry (Stage 3), greeting patient (Stage 4), reading medication list and other supplied information from hospital (Stage 5), comparing pre- and postadmission medication lists (Stage 6), disambiguation of prescriptions (Stage 7), surveying present medications and remedies (Stage 8), planning medication (Stage 9), dispensing medications for 2–4 weeks (Stage 10), leave-taking (Stage 11), documenting visit and planning next one (Stage 12). Two salient activities, namely *Mediating* and *Establishing order*, were prominent throughout the visits and consequently chosen to structure the presentation of the findings.

Mediating

The term *Mediating* concerned different ways in which the visiting nurse accommodated her approach to the individual patient and home conditions at the initial visit. Three different ways of medicating was described in the following: mediating on knowledge of the patient, mediating on information to the patient and mediating on rules and regulations.

Mediating on knowledge of the patient

Communication between the hospital and the municipal Visiting Nurses' Department began as the discharge was being planned already at the admission. During a patient's in-hospital stay, the Visiting Nurses' Department received an average of 10 pages of notes and care plans, with many repetitions and predefined question boxes, all of which were copy-pasted into the municipal care record. Rather than read this lengthy material, in planning the initial visit, nurses mediated time constraints by bringing with them only the latest medical record entry, namely the discharge report, trusting it to summarise the patient's situation. The following field notes showed the detriment involved in this practice:

> The nurse leaves for a home visit, bringing a printed 2-page discharge report. At the home, she dispenses the medications. According to the hospital's medication list, metabolic drugs are to be given in different dosages on alternating weeks. Contemplating this problem, she decides to repeat the prescribed dosage for the first 2 weeks. Later, a colleague discovers a note in the patient's medical record on the new metabolic treatment highlighting the importance of the visiting nurses' observation of side effects, the GP's subsequent adjustment of dosages, and the planning of blood tests. (Visit 1, field notes)

This example showed that nurses mediating time constraints could result in their overlooking of vital information in the written documentation, thus leading to incorrect dispensations.

The visiting nurse's limited contact with the patient might likewise lead to serious mistakes. When greeting the patient, the visiting nurse involved the patient as far as conditions permitted, occasionally assisted by family or nursing assistants present in the home.

> The nurse arrives at the home and goes in to the living room to talk with the patient, an 88-year-old woman. She is sitting on her sofa with a cup of coffee, a glass of water and a slice of soft, white bread on a plate in front of her. She was discharged the previous day. The nurse and the patient exchange greetings and shake hands. The nurse then asks, 'How was your hospital stay?' Shouting from the kitchen, a nursing assistant interjects, 'She can't remember anything'. (Visit 4, field notes)

This episode showed that a patient's impaired mental capacity might cause the nurse to miss important information, which the following case demonstrated, showing the importance of nurses' observational skills.

> The nurse enters the home shouting, 'Hello, it's the nurse here'. No response. She finds the patient lying in a hospital bed, long-side to the bedroom wall. The patient, a 90-year-old woman, was discharged after admission with apoplexy. She also has a liver tumour. She is fully dressed, lying on her right-hand side, facing into the room. Glasses of water and juice are on the bedside table. Taking her hand, the nurse greets the patient. The patient is silent but awake. Later, in the kitchen, the nurse reflects aloud, 'The medical record said that the patient had left-sided hemiparesis. That's not what I observed shaking her hand'. (Visit 2, field notes)

This example showed that nurses acted on insufficient knowledge when patients' cognitive impairment or physical exhaustion made it difficult for them to express their needs and conditions. Limited or imprecise medical record notes might also contribute to errors being made.

Mediating on information to the patient

Patient participation and informed consent were extremely important aspects of health care; the nurses,

nevertheless, mediated on the extent to which they informed the patients, as the following example showed.

> Leaving the house, the nurse meets a dispensary delivery and receives a paper bag containing medications. She returns to the house and, with the patient's permission, opens the bag and checks the medications. The patient says to the nurse, 'Oh, how nice to get things in order'. The nurse responds, 'Oh, yes, let's take a look', apparently not expecting things to be in order, though giving no sign of this to the patient. (Visit 12, field notes)
>
> Later, the nurse explained to MGK that fifteen prescriptions had been changed or added to the medication list; medications in the home were a shambles; and the patient was doing very poorly, so she did not want to involve the patient in her concern with the prescriptions. To avoid confusing the patient and undermining her faith in the healthcare system, here the nurse concealed her own misgivings. (Visit 12, field notes)

The above examples showed how nurses strove to obtain knowledge of the patients' situation, but that this was hampered by extensive and imprecisely written documentation and the limited opportunity for direct verbal communication with the patient. Moreover, both the digital care plans and hospital medication lists often raised concern, but the nurses rarely involved the patients in these.

Mediating on rules and standard procedures

The management of medication in the patient's home was regulated by the health authorities. The following field note illustrated the consequences of the rule preventing the nurse from changing the prescribing physicians' orders:

> The nurse visits an 88-year-old old woman. In comparing pre- and post-hospital medication lists, the nurse wonders why laxatives and mild painkillers have been omitted on the post-list. She calls the hospital, where a nurse relays her question to a physician and then she calls back. The answer is that the patient did not need these drugs during her 3-day hospital stay. The visiting nurse decides to re-enter the drugs on the medication list and later asks the GP to make a prescription. (Visit 9, field notes)

The nurse thus mediated a regulation as she saw that the patient needed the drugs prescribed and administered prehospitalisation.

Another instance of visiting nurses mediating occurred when patients occasionally used drugs that did not appear on the medication list:

> Saying goodbye to the patient in the kitchen, the nurse notices three bottles of tablets on the kitchen table and asks, 'Oh, do you take these tablets?', to which the patient replies, 'Yes, I used to, but I don't think I need them now'. The nurse advises her to continue the earlier treatment with fish oil, vitamins and minerals, explaining, 'Because now you must build up your strength after your fracture'. (Visit 10, field notes)

In this case, the nurse decided against changing the medication list despite the patient's self-administered vitamin supplements. A second reason for not changing the medication list was the frequent changes in drug names due to Danish dispensaries' obligation always to deliver the cheapest drug on the market. The frequent changing of drug names might lead the nurses to mediate another Danish regulation, namely, always to administer the drug named specifically on the medication list.

A final example illustrated mediating on the order not to dispense until all medications are available.

> At the initial visit, the nurse attempts to sort through the patient's prescriptions. She finds the dosette boxes from before hospital admission and considers discarding the previously dispensed medications. Eventually, she decides to remove and add tablets and starts dispensing for 2 weeks. One of the drugs will run out after 10 days. The nurse puts a label on the box reading, 'Drug X will be needed from Thursday evening, week 2'. She then requests a prescription for this medication from the GP and agrees on delivery method with the patient. Finally, she schedules an extra visit to dispense the needed medications. (Visit 2, field notes) (Figure 1)

In summary, the visiting nurses repeatedly mediated on regulations in managing home medication.

Establishing order

Establishing order in medication lists.

Visiting nurses indicated that a substantial effort was required to check prescriptions and that comparing pre- and posthospital medications was the most time-consuming task.

> While visiting a terminal lung cancer patient, with a collum femoris fracture, the nurse finds numerous discrepancies between pre- and post-hospital medication lists: eight new drugs have been prescribed, two for daily use and six for use as needed. Moreover, two drugs from before admission do not appear on the hospital's post-list. Ultimately, the nurse puts to question 15 of the listed prescriptions which had been omitted, added or changed in dosage or frequency (Visit 12, field notes) (Figure 2)

Figure 1 Mediating rules and standard procedures by adding and removing tablets.

The hospital's changes in medication led the nurse to reconsider the prescriptions in the light of the patient's current needs. Establishing order in the medication lists subsequently involved contacts with the hospital, the GP, nursing assistants and the family. Medication issues could not always be resolved during the initial visit, and a follow-up visit was often required.

Establishing order in medications in the home.

Every initial visit provided evidence that the daily tasks of housekeeping and home medication were inseparable; for instance, medications were often found stored with food in a kitchen cupboard (Figure 3). The families' involvement in establishing order in medications varied, but even when the professionals were responsible for storing of medications, the drugs might be extremely visible, as exemplified below:

> The nurse enters the home of a terminally ill man with prostate cancer. She finds him lying in a hospital bed in the bedroom, pale, emaciated and weak. The dining room table is strewn with tube feeding boxes, dispensary plastic bags, old and new medications in dosette boxes, medication lists, the patient's dentures, user manuals for assistive remedies, envelopes with extra medications, medication powder, cream tubes and hand-written notes to nursing assistants. (Visit 6, field notes) (Figure 4a)

Having taken stock of the situation, the visiting nurse then attempted to establish order in the medications, as evidenced in another observation:

> The nurse finds the medication lists in the kitchen and starts collecting medications from the kitchen table, the top of the mini-oven, the bathroom, etc. From a closet, she pulls out a red basket with medication bottles and boxes, dosette boxes, dispensary plastic bags with previously dispensed medications, separate tablets, disposable dosettes with barely legible names of days of the week, outpatient appointment notices. She places everything on the kitchen table and starts sorting through it, resolutely discarding most items, 'This one stays!'; 'That one goes!' The patient's outdated appointment notices are torn up, single tablets returned to the dispensary and much goes in the trash bin. (Visit 4, field notes) (Figure 4b)

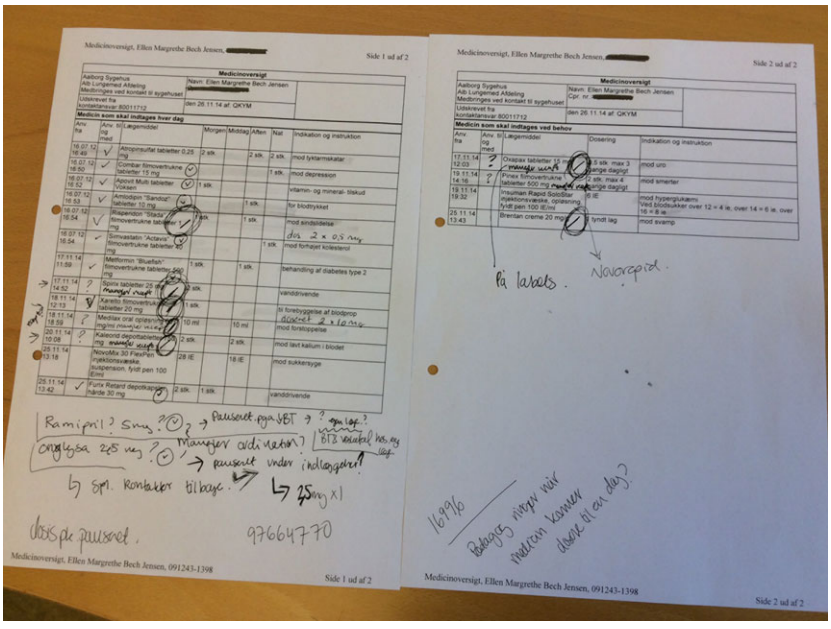

Figure 2 Establishing order in medication lists by disambiguating prescriptions.

Figure 3 Food and medications stored alongside in a kitchen cupboard.

In fact, the hospital was charged with the ordering and delivery of medications, but visiting nurses occasionally found that this had not been done successfully. Nonetheless, it was probably impossible for the hospital to know what medications were actually present in the home, which was exemplified in the following field observation.

> Going over the medication list with the patient, the nurse discusses the dosages and the need for painkillers. The nurse follows the patient's directions and finds medication bottles scattered about the house. Back at the kitchen table, she sits opening the vials, one by one. Two are empty and a third does not have enough tablets to last the coming week. The patient suggests that her gardener can pick up the medications at the dispensary in the afternoon, and the nurse calls the GP to order the needed medications. (Visit 10, field notes)

The absence of medications due to missing prescriptions or delivery problems thus was a typical problem encountered by nurses. In response, they struggled to establish order by inventing procedures adapted to each patient, GP and the dispensary, as in the above example, where the gardener fetched the medications. Despite the multitude of individual solutions, some commonalities in establishing order were observed:

> Placing her pen against each item on the medication list, the nurse systematically lines up the drugs. She checks names, active ingredients, dosages and dates of expiry. She then starts distributing the tablets in the dosette boxes, one drug at a time. After each, she checks that the supply will last until the next delivery; otherwise, an order must be placed. Finally, the nurse sorts the medications into two piles: 'In use' and 'Not in use'. The medications 'In use' are then further sorted into 'Dispensed medication', 'Daily, not dispensed medication' and 'Use as needed'. Everything is stored in the patient's home (Visit 4, field notes) (Figure 5).

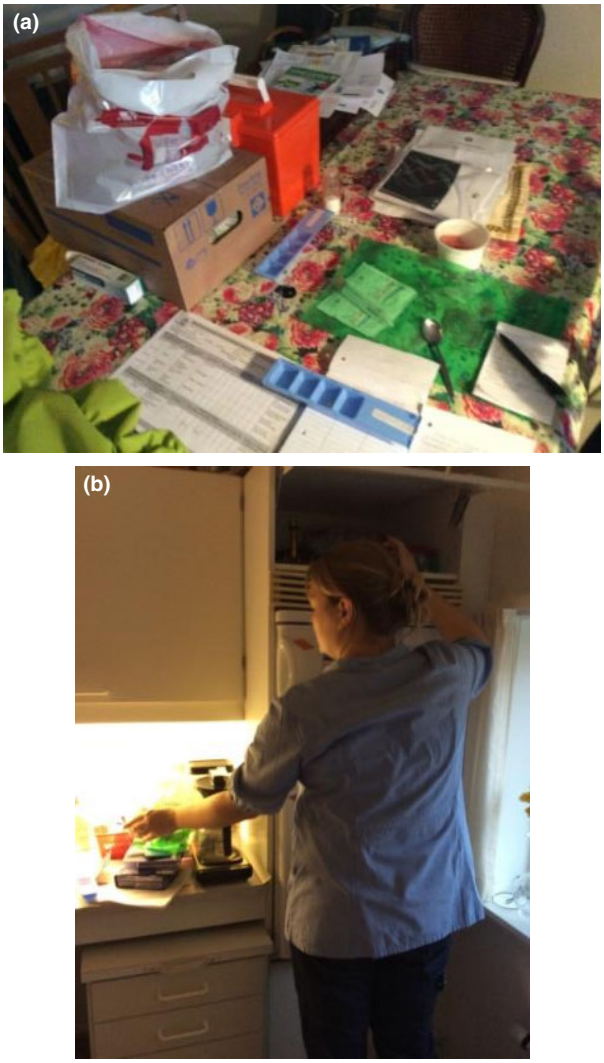

Figure 4 Establishing order in medications in the home.

Although the sorting related in the above example was the most common, the nuances in the variations of this theme evidenced the uniqueness of each medication management adjusted to each patient.

Discussion

The aim of this study was to explore visiting nurses' medication management in patients' homes after hospital

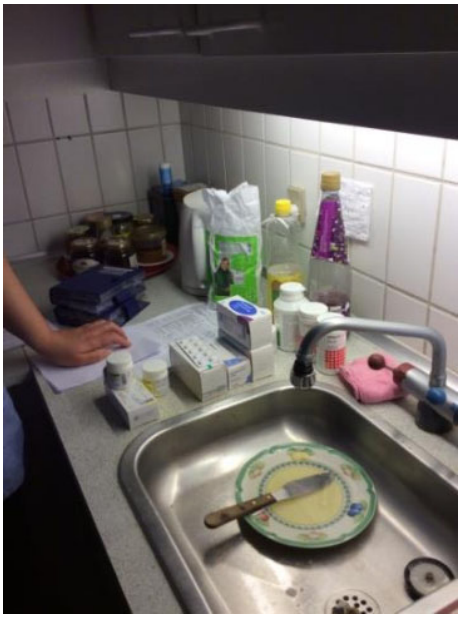

Figure 5 Establishing order by systematic working practice.

discharge and to identify key elements in patient medication for improved patient safety. The analysis revealed *Mediating* and *Establishing order* as salient activities which represented key elements in safe medication management. The theoretical framework of this study, the Fundamentals of Care framework (FOC framework), emphasised nurses' responsibility to keep the patient safe in an environment in which recovery and healing were optimised and where the patient was respected as a human being (24). While this framework emphasised patient safety and care environment, we discussed mediating and establishing order in the light of patient safety and the three elements in the FOC framework: relation, integration and context of care.

Relation

The relationship between the nurse and the patient, the core of the FOC framework, was based on the nurse's commitment to care for the patient (24). In the present study, nurses showed this commitment by making an effort to establish a nurse–patient relationship at the start of each visit. They greeted the patients, and despite limited interaction, due to the patients' incapacities or infirmities, the nurses used this initial relation to observe the patients' condition and to obtain knowledge of them via nonverbal and verbal communication, for example, by posing different sorts of questions. Nurses' relationship to patients, with reduced ability to express needs and wishes, might depend on the nurse's ability to improvise, use imagination and try out different solutions (31). Also McDonald et al. (32) found that home care patients' difficulties in the reception and comprehension of information due to cognitive impairments, such as memory loss, or decreased functionality, due to illness or medications, might be a patient safety challenge. In addition, we also found that the patients' limited ability to express needs and wishes led the nurse to mediate on knowledge of the patient and draw on other knowledge sources, such as observation skills, written documentation or collaborators. This finding suggested that nurses' observation skills were important and had to be emphasised in nursing education and in the continuous development of nursing skills. Active involvement of the patient's relatives as a valuable knowledge source with deep knowledge of the patient's needs and preferences could be suggested.

Integration

According to the FOC framework, the integration of care was when the nurse's initial assessment was used to construct a series of practical actions that addressed the patients' physical and psychosocial needs (24). We found that proper medication was closely connected to the patients' physical needs. For instance, treatment with painkillers influenced their mobility, and treatment with diuretics, laxatives and anti-emetics influenced their need to be fed and hydrated. Therefore, the nurses' considerations on prescriptions influenced patient safety. The nurses mediated on knowledge of the patient by considering questions, such as whether the patient was in pain, had hemiparesis or was capable of drinking unassisted. McDonald et al. (32) also found maintenance of the patient's physical needs as a patient safety marker in home care. They emphasised that failure in adjustment of medications might lead to unwanted or unpleasant side effects and that a continuous adjustment of medication regimens required the ability in the providing organisation to monitor patients' basic needs (32). We witnessed nurses mediated on adjustment of prescriptions to the patients' actual health status by establishing order in medication lists. This finding highlighted the importance of interprofessional working processes that supported symptom evaluation and enabled adjustment of medications.

Integration of care implied taking patients' different levels of dependence and independence into account (24). In the present study, patients' different levels of dependence and independence led the nurses to mediate, for example on the level of establishing order in medications in the home by considering which of these to throw away. This finding was supported by Young et al. (33), who found that nurses' medication management required striking a balance between autonomy and risk. Mahoney and Goc (34) further explored tensions in independent living and found that relatives might expect health professionals to provide a high level of service and quality of care; that patients might strive for independence; and that health professionals might experience a tension between being helpful and respecting the

patient's autonomy and privacy (34). If health care professionals respected the patient's decision to decline support, they might expect that a further deterioration in the patient's health would result in the need for further support later. This finding shed light on the importance of clarification of expectations and responsibilities in visiting nurses' medication management, as well as nurses' development of skills in making sound clinical judgements and in negotiating their services with patients and relatives.

Context

The context of care reflected the codependency between the nurse–patient relationship and the entire healthcare system and reflected in resources, staffing, leadership, as well as policy and regulatory issues (24). In the present study, contextual challenges to patient safety were the patient's home as the context of care, the organisation of care and regulatory issues.

In the present study, the homes, as the context of care, were characterised by the haphazard storage of medications and outdated medication lists and hospital appointment notes, remedies and tablets, which led the nurses to mediate on knowledge of the patient and to establish order in medications. Likewise, Lang et al. (35) found risky practices in the storage of medications in homes where seniors managed multiple medications. They found the storage of and access to medications were variable and that medications often got lost in household clutter and in cupboards, which might unintentionally hamper safe medication management (35). Although professionals were involved, we also found storage of medications unique for every household and a variety of systems put in place. We found, like Lang (35), that each home had 'its own system' for getting prescriptions filled, renewed and delivered, as well as for storage, packaging and taking of medications. McDonald et al. (36) also raised the issue of blurred lines between where care ended and the home began, when care was moved into the home and changed the home into a care setting. In the present study, the blurred lines were evidenced when nurses, against recommendations, accepted that patients had medications not figuring on the medication lists or removed and added tablets from dosette boxes. This highlighted the importance of balancing patients' privacy and choices with medication safety by clarification of expectations and responsibilities. This was influenced by nurses' competence level and pharmacological knowledge.

The present study showed how the organisation of care, with many stakeholders in the home, required oral and written communication and challenged the continuity of care. This led the nurse to mediate on knowledge of the patient. The excessive amount of documentation was occasionally misleading and sometimes caused nurses to disregard or mistrust it, as others have also noted (37). That many stakeholders involved could hamper patient safety was supported by other studies. Lang et al. (35) stated that many stakeholders affected the health systems' capacity to collaboratively plan, implement and re-assess the safety of medication regimens and patient care to ensure optimal outcomes, and McDonald et al. (32) argued that many stakeholders in the home might hamper the establishment of supportive and trustful relationships. Both written and oral communication presented obstacles to safe medication management. This was documented by nurses' efforts in establishing order in medication lists by contacting hospitals and GPs. That nurses' questions were relayed several times when phoning a hospital to discuss prescriptions illustrated their position in a hierarchical culture (37). Similarly, Young et al. and McDonald et al. found staff communication as an area of focus to optimise safe medication management (33, 36). In short, communication and documentation procedures were important issues in securing medication safety in patients' homes.

Contextual challenges might also be reflected in nurses' ability to act within the system and political level (24). When patients were dependent on professional help with managing medications, regulations had to be in place to safeguard both patients and professionals. In contrast to self-managing patients, who administered a prescribed drug by following a physician's oral instructions, a written prescription was now required (22). Work rules required the nurses to dispense the medications exactly as prescribed by the hospital, but we observed their committed efforts to mediate these rules in order to adjust medications to actual patient needs. This happened, for example, when nurses dispensed a drug that was still found in the home but was omitted by the releasing hospital. In such cases, they subsequently asked the GP to write a new prescription. This finding was supported by Lang et al., (35) who also found that patient safety was affected by contextual challenges, which led the staff to devise workarounds to improve medication management despite system barriers, and that nurses needed literacy to navigate in the system to maintain medication safety in the home. In the present study, nurses devised workarounds by adapting their actions to the situation and the individual patient or colleague, rather than stringently adhering to regulations. An organisational study supported this practice (38), stating that professionals executed their work based on individual judgements as much as by regulations, despite their work being heavily regulated to ensure control and standards. In addition, the study confirmed that the link between rules and actions in professionals' work was often tenuous and rules were often disregarded (38), which we also found. This emphasised the importance of clarification of nurses'

responsibility in medication management in patients' homes and their continuous development of skills in making sound clinical judgements based on knowledge and ethical values.

Study limitations

This study explored visiting nurses' medication management after their patients' discharge from hospital. It provided an in-depth investigation into a general problem that might vary according to organisational structures. Although the findings might be relevant for home healthcare workers generally, the detailed description of context enabled readers to draw their own conclusions by comparison with their own context. Most of the patients had a cognitive impairment or a limited ability to maintain own basic needs, and thus, they did not compare with home care patients in general. Nevertheless, studies involving patients most in need of nursing were particularly important because this group could not express their needs and wishes. Nurses were studied as a group, rather than as individuals. Although the ages and experience of the participating nurses represented those of nurses in general, our findings might have been affected by the fact of their voluntary recruitment. Despite differences due to patients' capabilities, social networks and preferences, as well as nurses' individual differences, common stages and salient activities were found. Trustworthiness was sought enhanced by the detailed analysis, which helped in setting aside the first authors' preunderstanding, and by continuous dialogue with supervisors, as well as all of the visiting nurses and charge nurses in the district to confirm the relevance of the study and of its findings.

Conclusion

Visiting nurses' management of medications in the patients' homes after hospital discharge involved 12 stages, performed in accordance with the individual patient's health status, preferences and home conditions. Nurses strove to adjust medication management to the unique patient by mediating and establishing order. The nurse–patient relationship, the integration of care and the context of care challenged patient safety. If visiting nurses were to fulfil the responsibility of keeping patients safe in an environment in which recovery and healing were optimised, and each patient was respected as a human being, then the following implications for practice should be considered: nurses' opportunity for continuous evolvement of observation skills and skills in making sound clinical judgements, the establishment of interprofessional working processes, which support continuous assessment of the patients' needs and adjustment of care and treatment, and clarification of expectations of nurses' responsibility and patients' privacy. The key elements, of mediating and establishing order, as well as the FOC framework, provided a basis for the development of interventions to ensure improved patient safety in visiting nurses' medication management in patients' homes after hospital discharge.

Acknowledgements

The authors thank Visiting Nurses Department, Aalborg Municipality, Denmark, for positive collaboration.

Author contribution

MGK, TC and BSL were involved in study conception/design and performed critical revisions for important intellectual content; MGK performed data collection/analysis and drafted the manuscript; TC and BSL carried out supervision.

Ethical approval

The Danish Data Protection Agency approved the study (j.nr. 2015-55-0585).

Funding

No funding was received.

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