



QUALITY IMPROVEMENT IN MEDICATION SAFETY: A COLLABORATIVE APPROACH

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ABSTRACT

Background: Transitional care is crucial in healthcare due to reduced hospital stays and post-discharge care needs. It ensures smooth transitions between healthcare settings, but can be hindered by insufficient training, communication, medication availability, and low health literacy. Various healthcare workers contribute to achieving drug safety. **Aim of Work:** The objective is to integrate information and examine the nurse's involvement in medication management throughout the transfer of care. **Methods:** A comprehensive systematic review was done. A systematic search was conducted in electronic databases, including PubMed (Including Medline), Web of Knowledge, Scopus, and Cinahl, covering the period from January 2010 to 2016. Included in this study were original qualitative and quantitative research papers published in English that specifically examined the nurse's involvement in managing medications during transitional care. This care included the mobility of patients between short-term, long-term, and community health- care settings. **Results:** Through the search method, 10 papers were retrieved. These studies were published in English between the years 2014 and 2016. Their primary emphasis was on the nurse's involvement in managing patients' medications throughout transitional care in different healthcare settings. The review results were presented narratively using three categories devised by the authors, due to differences in the objectives and approaches of the chosen research. Under the area of 'medication reconciliation process', the nurse engaged in activities such as gathering medication history, conducting medication review, identifying medication discrepancies, collaborating on medication reconciliation, and making necessary adjustments. The second category, referred to as 'partnership with other healthcare professionals', emphasizes the nurses' involvement in addressing medication-related issues, facilitating multidisciplinary communication and consultation, coordinating discharge plans, and overseeing patient monitoring. Under the area of 'supply of support to healthcare recipients', the nurse's duties included engaging in interpersonal contact with patients, providing education on medications, streamlining medication regimes, and managing symptoms during transitional care. **Conclusion:** Nurses have a vital role in ensuring the safe handling and administration of medications throughout the process of transitioning patients between different levels of care. Thus, it is essential to provide them authority and increase their participation in efforts related to the administration of medications within the healthcare system. To ensure patient safety and prevent medication mistakes during transitional care, it is crucial for medications management to include teamwork across many disciplines and excellent communication among health- care personnel.

KEYWORDS: *Multidisciplinary Teamwork – Continuity of Care – Nurse – Medications Management – Patient Safety – Transitional Care – Review.*

INTRODUCTION

Transitional care has gained significance in patient care within the healthcare system as a result of reduced hospital stays and the heightened need for post-discharge care.^[1] Due to the correlation between patient handovers during transitional care and the occurrence of adverse events, transitional care has been recognized as a part of the patient care journey that poses a high risk.^[2-4]

Transitional care refers to a series of established methods

that guarantee the smooth and organized transition of healthcare services when a patient moves between different levels of care within the same or different healthcare settings.^[5,6] The transmission of vital information and the responsibility for patient care from one healthcare facility to another is the basic and indispensable aspect of quality and safety in healthcare settings.^[7] Insufficient patient or caregiver training, improper communication between healthcare professionals, inadequate assessment of medication

availability, and low health literacy levels are all factors that might hinder successful transitional care between healthcare settings.^[8] As a result, there has been a significant focus on researching and implementing transitional care in the field of medical sciences.^[9]

Medication safety is an essential aspect of patient care that seeks to minimize the likelihood of negative medication events and promote successful therapeutic results. Attaining drug safety necessitates a cooperative endeavor including diverse healthcare workers, such as nurses, pharmacists, cardiologists, and medical records staff. Each of these jobs makes a distinct and valuable contribution to the overall safety and quality of drug management.

Transitional care

Management of Medications and Ensuring Patient Safety: Ensuring patient safety and preventing hospital readmissions requires achieving optimal transitional care between healthcare settings. Studies have shown that effective transitional care can reduce the risk of readmission within 30 days of discharge by 50% and result in a cost savings of \$2 for every \$1 spent in the healthcare system. Transitional care programs act as a bridge between pre-discharge and post-discharge interventions, providing care at various points in time. Promoting patient participation, as well as fostering cooperation and communication among healthcare personnel, is encouraged throughout the whole healthcare journey, from admission to primary care, till the patient's discharge to their own residence.^[10-13]

Effective management of medications is a crucial aspect of delivering excellent treatment and ensuring patient safety throughout the transition between different healthcare settings.^[14] One of the main strategies recommended by the World Health Organization (WHO) to enhance patient safety is to prioritize drug safety during transitional care.^[15] Furthermore, drug-related problems have been recognized as significant elements of excellent care in transitional care.^[16] Specifically, it is crucial to ensure the safe transfer of the medication regimen.^[17] Transitional care programs may effectively mitigate medication-related issues, enhance the availability of medication treatment, provide comprehensive medication counseling, and address gaps in medication care after hospital release.^[10] Nevertheless, patients undergoing transitional care between healthcare settings are susceptible to medication errors as a result of inadequate communication among healthcare providers, insufficient education and training, inadequate follow-up, insufficient medication reconciliation, and a lack of involvement from patients and their family caregivers in managing medications.^[18] Transitional care is responsible for 46%–56% of all pharmaceutical mistakes that might have been avoided.^[19] A comprehensive evaluation revealed that between 11% and 59% of medication history inaccuracies during admission and discharge had the

capacity to cause damage to the patient.^[20] In a Cochrane analysis, Mekonnen et al.^[21] found that 559 out of 1000 patients were susceptible to one or more drug inconsistencies during routine transitional care programs. Important aspects of care transition in the healthcare system, where patients face the possibility of harm from medication, include the transition from hospital to home, hospital admission, transfer, discharge, post-discharge, and admission to the emergency department.^[22-26]

Medicines management is a challenging task in healthcare settings such as hospitals and nursing homes, requiring collaboration among healthcare providers like nurses, physicians, and pharmacists. The goal is to maximize positive healthcare out-comes and minimize errors. Medicines management is a complex and interdependent clinical challenge in healthcare, with each provider having independent, joint, and overlapping responsibilities.^[27-30] Nurses play a crucial role in the transitional care team, evaluating care plans, identifying potential issues, and resolving them to enhance patient safety. Involving nurses in medicines management during transitional care improves access to care for patients with fragmented care or those at high risk of readmission. They have been proposed as a substitute for emergency services, since they enhance the efficiency of referring doctors and facilitate the transition of patients back to community healthcare providers by providing patient education and promoting self-management of medicines.^[31-38]

Aim of work

Although nurse engagement in medication practice safety and transitional care success are crucial, there is a lack of comprehensive understanding of the nurse's role in managing medications during transitional care in the global literature. This research sought to consolidate information and examine the nurse's role in managing medications during transitional care.

Methods

In order to discover suitable keywords, the study team engaged in internal conversations and relied on their expertise in the areas of transitional care and medications management. In addition, they performed a preliminary search in both broad and specific databases to identify appropriate keywords. The Boolean search method was used to identify papers that discuss the nurse's role in medicines management during transitional care. The search was conducted using the keywords: nurs* AND (participation OR involvement OR engagement OR role) AND ("transitional care" OR "transition of care" OR "care transition" OR "healthcare transition" OR "continuity of patient care") AND ("medicines management" OR medication OR medicines OR drug OR "pharmaceutical preparations" OR pharmaceuticals). Assistance and assistance were provided by a knowledgeable librarian during the search procedure. The online databases of PubMed, comprising Medline, Web of Knowledge, Scopus, and Cinahl, were

searched to retrieve articles published in online peer-reviewed scientific journals from January 2010 to 2016.

The role of nurse in managing medications throughout the transition of care

Due to variations in the methodology, aims, and outcomes of the investigations, a meta-analysis was not possible. Therefore, our review findings were given in a

narrative format. Three distinct areas were found regarding the nurse's involvement in ensuring the safety of medication management during transitional care. These categories include the "medication reconciliation process," "collaboration with other healthcare providers," and "provision of support to healthcare recipients." The identification of these groups was based on an examination of the data from the research (Fig. 1).

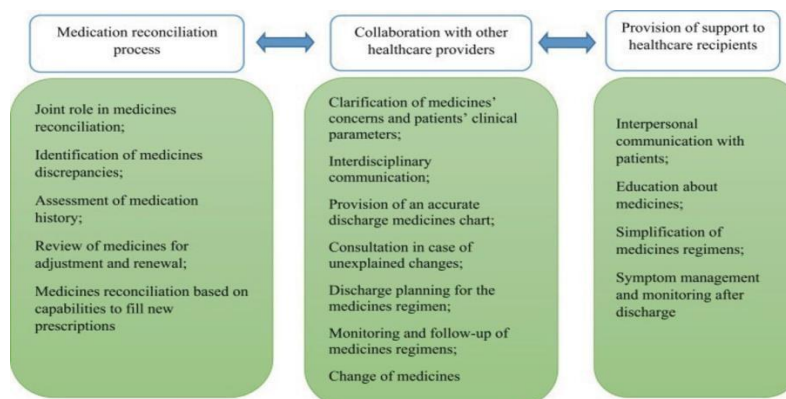


Fig. 1: The nurse's responsibility in the management of medications during transitional care.

Process of medication reconciliation

This topic explores the nurse's involvement in the evaluation of medications during transitional care across different healthcare settings. Nurses were seen to have a vital role in medicines management via the reconciliation process, which included evaluating an accurate list of a patient's current medications and comparing it with the current list being used. The nurses were assigned three primary duties, namely "evaluation of medication history," "detection of medication inconsistencies," and "collaborative involvement in medication reconciliation." These roles were defined as follows.

Nurses were responsible for gathering patients' medication history during admission to healthcare centers or during transitions between healthcare levels. Chhabra et al.^[39] observed that clinical nurses participated in the medication reconciliation process upon admission. Therefore, emergency nurses obtained the medication history, while admitting floor nurses gathered supplementary medication history and sent the medication reconciliation report to admitting doctors. The average duration for admitting floor nurses to gather medication history before putting admission orders was 11 minutes, but after placing admission orders it was 16.6 minutes. Although there was no significant difference in the meantime spent, the time spent per medicine after issuing admission orders (2 minutes) was greater than before it (0.94 minute). In the study conducted by Chan et al.^[40] nurses were responsible for acquiring the most accurate medication history and conducting medication reconciliation for patients admitted to the cardiology ward, critical care unit, or those who were transferred between wards.

The tasks of nurses were said to include reviewing drugs

generally, collecting information to detect prescription discrepancies, and providing pharmaceutical assistance and deprescribing processes. In Lovelace et al.^[41]'s transitional care plan, the case management nurse conducted an initial evaluation and thorough medication review either during the first home visit or via a follow-up phone call following the patient's departure from the hospital. The nurse practitioner who treats patients outside of the hospital worked together with the nurse responsible for coordinating patient care during visits to patients' homes. The prescriptions were evaluated based on the evaluation given by the case management nurse. Adjustments were made and drug renewals were requested if the case management nurse encountered challenges in accessing primary healthcare doctors. Mitchell et al.^[42] documented the provision of transitional care to older adults, both with and without dementia, during their transition from the hospital to long-term care facilities and home. The study found that registered nurses successfully administered medication to 99% of patients, while advanced practice registered nurses achieved a medication delivery rate of 37%. Advanced practice registered nurses were characterized as having a significant role in doing medication review and medication reconciliation.

The research conducted by Toye et al.^[43] focused on examining nurses' viewpoints on their involvement in assisting family caregivers with medication management and providing support throughout the transition to home hospice care. Nurses saw medication review as an essential element of medication assistance and the deprescribing process. The nurse's duty involved reviewing the medication list to identify necessary and unnecessary drugs, explaining them to the family caregiver, and consulting with the physician to obtain

advice on discontinuing unnecessary medications in order to avoid side effects, adverse drug reactions (ADRs), and polypharmacy. The nurse would moreover oversee the administration of medication by the patient and the family caregiver prior to making any determinations about modifications to crucial medications.^[44]

Vogelsmeier^[45] states that nurses at nursing homes played a crucial role in conducting medication reconciliations. They were responsible for evaluating medication history and detecting any inconsistencies in prescription orders throughout the transfer to nursing homes. Several nurses engaged in “active information seeking” by examining transfer documentation and engaging in conversations with residents and their families to get a comprehensive understanding of medication history and the rationale behind medication orders. Some individuals engaged in “passive information seeking” by assuming that medicine orders during transfers were accurate. They believed that time constraints and excessive workloads made it difficult to identify anomalies in medication orders. A significant number of nurses actively participated in the cognitive process known as “sense-making,” when they attempted to find differences in medicines. Regarding this matter, signals such as rules/regulations, particular drugs, and the occurrence of mistakes and adverse effects were taken into account to assess any differences.

In the research conducted by Lovelace et al,^[41] nurses played a collaborative role in post-acute care clinics, namely in managing medications for patients who were discharged from the hospital and returned to their own homes. Medication reconciliation was initiated by evaluating the patients’ ability to complete their new prescriptions. This was done by making telephone calls to the patient or their caregiver within two working days after discharge.^[46]

According to Hammour et al,^[47] nurses played a supporting role in collaborating with pharmacists and doctors to ensure accurate medication reconciliation throughout the whole hospital stay, from admission to discharge. Nurses rank themselves second only to physicians in medication reconciliation due to their ability to: gather a precise medication history upon admission, confirm and resolve any inconsistencies between the medication history list, the medications prescribed upon admission and during transitions, and transmit the list of medications to the subsequent healthcare provider upon discharge. Nurses believed that they ranked second only to pharmacists in providing guidance and advice to patients on medication instructions following their release from the hospital. Pharmacists consider the nurses’ participation in medication reconciliation to be less significant compared to that of pharmacists and doctors. This is because nurses are not responsible for providing the patients’ discharge medication list to the next healthcare provider. Physicians

saw the nurse fulfilling a supporting function in the medication reconciliation process, with primary responsibilities being carried out by themselves and the pharmacist in the medication reconciliation during transitional care.

Cooperation with other healthcare providers

This category delineates the nurse’s responsibility in the management of medications throughout the transitional care process across different health-care settings, working in conjunction with other healthcare professionals. The research conducted by Manias et al^[48] examined communication on medicines management throughout the transition from emergency departments to medical wards. The study found that nurses in medical wards took a proactive approach by addressing concerns about medicines with physicians. The nurses in the medical ward assessed the clinical parameters of patients who were moved from the emergency department and informed physicians about the obtained information, which resulted in appropriate modifications to their medication. Upon the patient’s admission to the nursing home, the nurses promptly coordinated the modification of medications by contacting the general practitioner by telephone.

Interdisciplinary communication among health-care professionals, including nurses, physicians, and pharmacists, played a significant role in managing medicines during transitions of care. Verbal communication was considered crucial by nurses for quickly providing appropriate care. However, asynchronous communication methods, such as discharge summaries and referral letters, were also highly valued. Ensuring the precision and clarity of the recorded communication content was crucial in order to prevent any errors in drug administration throughout transitions of care. Nurses recognized the need of written communication in order to confront the demands of a rapidly evolving environment.^[48]

In the research conducted by Lovelace et al.^[41] a portion of the patients were sent to nursing homes for brief periods of rehabilitation after being discharged from the hospital. This decision was made in accordance with the transitional care program that was developed. The pharmacist reached out to the nursing home to get a roster of drugs prescribed upon discharge. Subsequently, the pharmacist sent the list and relevant details to the case management nurse, who then called the patients or their caregiver to arrange a visit to their residence. After doing a home visit, case management nurses would thereafter inform the members of the transition care programme team, as well as the patients’ primary care physician and care manager, about any inconsistencies or errors in medication. The case management nurse would also cooperate with a pharmacist to create an accurate discharge medication record, including necessary modifications to the print size for patients with poor vision.

Vogelsmeier^[45]'s research discovered that nursing home doctors depended on the nurse's knowledge and suggestions to determine the drugs that the resident should be taking. This reliance was due to the fact that nursing home physicians only provided treatment to residents inside the nursing home setting. The doctors had little knowledge of the medical treatment provided to residents before they were transferred. They seldom spoke with other healthcare professionals and were not present throughout the transfer process. Consequently, nurses played a crucial role in providing information about medication management and would ask the physician to carry out necessary evaluations and examine laboratory results. Before prescribing medications, the nurse would first confer with the physician.

Reidt et al.^[44] concentrated on a strategy for interprofessional cooperation that enhanced the process of transitioning patients from a skilled nursing facility to their homes. Nurses assumed the primary responsibility for discharge planning from the skilled care facility. Prior to discharge, the pharmacist would examine the electronic health record to assess the dietary supplement prescriptions and over the counter medications in terms of their purpose, effectiveness, and safety. They would also verify if any changes were made to the medications during the hospital and skilled nursing facility stays and ensure that they are still suitable. The pharmacist addressed any unexplained changes by collaborating with the nurse practitioner and providing advice, such as initiating or discontinuing medications, modifying dosages, or ensuring that appropriate laboratory tests were done for the medication plan at release. Furthermore, the pharmacist and nurse together established the drug plan for discharge. In addition, the nurse supervised the adverse effects of certain medications and provided patients with reminders about their follow-up visits.

Provision of assistance to those receiving healthcare

This topic explores the role of nurses in providing help to healthcare receivers in managing medications during transitional care across different healthcare settings. Toye et al.^[43] investigated the viewpoints of nurses on their involvement in assisting family caregivers with medication management and providing support throughout the transition to home hospice. Nurses imparted information and facilitated the development of skills for family caregivers, with a particular focus on enhancing their understanding and education about symptoms. In order to facilitate the development of skills, their emphasis was on managing symptoms rather than organizing and administering medications. To simplify the medication regimen for patients and family caregivers, nurses eliminated as many medications as possible. Additionally, nurses improved trust and communication by attentively listening to patients and their family caregivers and addressing the concerns of family caregivers when reducing the number of prescribed medications.

Mitchell et al.^[42] assessed the effectiveness of transitional care treatments delivered by different healthcare providers to older persons, both with and without dementia, throughout the transition from the hospital to long-term care facilities and home. Nurses were the main caregivers responsible for instructing patients on medicine use and teaching them how to handle and supervise symptoms after their release from the hospital. Experienced registered nurses with advanced skills also assisted in providing information on the treatment and monitoring of symptoms. The Hammour et al.^[47] research highlighted the significant contribution of nurses in providing instructions and counseling to patients on medication following their discharge. Manias et al.^[48] emphasized that ensuring drug safety relies on effective interpersonal contact between health professionals, especially nurses, and patients. The provision of medication instructions for patients during transitions between their residences and the hospital enabled patients to have a more proactive role in the management of their medications.

The role of nursing

Nurses have a crucial role in ensuring drug safety by providing direct care to patients and continuously evaluating their condition. Their responsibilities include the administration of drugs, verification of doses, and provision of patient education on recommended therapies. In addition, nurses diligently observe patients for any negative responses or undesirable consequences, promptly informing the healthcare staff. By being at the forefront, they are able to detect and rectify any mistakes in medicine, therefore promoting a culture of safety in the hospital setting.^[49]

The role of pharmacy

Pharmacists play a crucial role in guaranteeing the safety of medications through the provision of medication management and counseling. They do comprehensive medication reconciliations throughout patient admission, transfer, and discharge to avoid inconsistencies that may result in mistakes. Pharmacists are also involved in managing the list of approved medications, evaluating prescriptions for possible interactions or reasons not to use them, and working together with healthcare professionals to improve the use of medications. Their proficiency in medication management contributes to improving patient outcomes and reducing hazards related to pharmacological therapy.^[50-53]

The significance of cardiology

Cardiologists have a vital role in ensuring the safety of medications for patients with cardiovascular problems. Their responsibility is the development of treatment regimens that are based on evidence, taking into account the specific requirements of each patient, possible interactions between drugs, and any contraindications. Cardiologists collaborate closely with nurses and pharmacists to ensure the appropriateness and efficacy of drug regimes. Participating in multidisciplinary rounds

enables team members to engage in open communication, enabling them to promptly modify treatment plans in response to patient feedback and safety considerations.^[54,55]

The importance of medical records

Precise and thorough medical records are essential for ensuring drug safety. Personnel tasked with preserving medical records have a vital responsibility in assuring the proper documentation of drug orders, administration data, and patient reactions. This information is crucial for facilitating effective communication among healthcare team members and for conducting comprehensive medication audits. Accessible and up-to-date medical records enhance clinical decision-making and help reduce medication mistakes by giving a thorough picture of a patient's medication history.^[56,57]

Collaborative strategies for improvement

For medication safety to be improved, it is crucial to adopt a collaborative approach involving nurses, pharmacists, cardiologists, and medical records personnel. Some strategies for enhancing quality include:

- Interdisciplinary Communication: Regular team meetings and interdisciplinary rounds can enhance open dialogue regarding medication management and patient safety.
- Continual education and training for all members of the healthcare team regarding the most effective methods in medication management can enhance their understanding and abilities in ensuring medication safety.
- Utilizing electronic health records (EHR) and medication management systems can enhance precision in prescribing and administering medications, thereby decreasing the probability of errors.

CONCLUSION

This study examined the nurse's involvement in managing medications during transitional care and assessed its influence on patient safety. The study used both qualitative and quantitative research results using an integrated review approach to provide a thorough understanding of the topic being studied. Enhancing the standard of medication safety is a collective obligation among diverse healthcare practitioners. Healthcare organizations can promote a culture of safety and greatly decrease the likelihood of harmful drug incidents by utilizing the distinct expertise of nurses, pharmacists, cardiologists, and medical records personnel. Cooperative endeavors focused on improving communication, education, and technological integration will ultimately enhance patient outcomes and guarantee the provision of safe and effective medication therapy.

Proper emphasis should be placed on degree level education and in service training for nurses, given their crucial role in medications management throughout the transitional care phase. Efficient administration of

medications and the prevention of pharmaceutical mistakes need the acknowledgment of duties and positions, as well as a collaborative and communicative approach among diverse healthcare practitioners, such as nurses, physicians, and pharmacists. Healthcare workers engage in multidisciplinary cooperation and communication to achieve shared goals, demonstrate shared responsibility and authority, collaboratively make choices, and collaborate to enhance drug safety during transitional care. Furthermore, it is crucial for health professionals to acknowledge the nurse's responsibility in medications management in order to guarantee the safety of medication during transitional care. Future research should investigate how nurses can play a more active role in managing medications during transitional care. This research should use both qualitative and quantitative methods to examine the impact on patient care outcomes, such as medication adherence, emergency department visits, and readmission rates to long term healthcare facilities.

REFERENCES

1. DONALD F, KILPATRICK K, REID K, et al.: Hospital to community transitional care by nurse practitioners: a systematic review of cost-effectiveness. *Int J Nurs Stud*, 2015; 52(1): 436–451.
2. WYSOCKI A, KANE RL, DOWD B, GOLBERSTEIN E, LUM T and SHIPPEE T.: Hospitalization of elderly Medicaid long-term care users who transition from nursing homes. *Journal of the American Geriatrics Society*. Jan, 2014; 62(1): 71-8.
3. TSILIMINGRAS D and BATES DW.: Addressing postdischarge adverse events: a neglected area. *Jt Comm J Qual Patient Saf*, 2008; 34(2): 85–97.
4. TSILIMINGRAS D, SCHNIPPER J, DUKE A, et al.: Post-discharge adverse events among urban and rural patients of an urban community hospital: a prospective cohort study. *J Gen Intern Med*, 2015; 30(8): 1164–1171.
5. NAYLOR MD, AIKEN LH, KURTZMAN ET, OLDS DM and HIRSCHMAN KB.: The care span: the importance of transitional care in achieving health reform. *Health Aff (Millwood)*, 2011; 30(4): 746–754.
6. World Health Organization (WHO). Transitions of Care: Technical Series on Safer Primary Care. Geneva: WHO, 2016. Available from: <https://apps.who.int/iris/bitstream/handle/10665/252272/9789241511599-eng.pdf;jsessionid=08FCC79EDB6223987AEFA4611AD59B0E?sequence=1>. Accessed January 20, 2020.
7. AASE K, LAUGALAND KA, DYRSTAD DN and STORM M.: Quality and safety in transitional care of the elderly: the study protocol of a case study research design (phase 1). *BMJ Open*, 2013; 3: 8. doi: 10.1136/bmjopen-2013-003506
8. PHATAK A, PRUSI R, WARD B, HANSEN LO, WIL- LIAMS MV, VETTER E, CHAPMAN N and

- POSTEL-NICK M.: Impact of pharmacist involvement in the transitional care of high-risk patients through medication reconciliation, medication education, and postdischarge call-backs (IPITCH Study). *Journal of hospital medicine*. Jan, 2016; 11(1): 39-44.
9. ORVIK A, NORDHUS GE, AXELSSON SB and AXELSSON R.: Interorganizational collaboration in transitional care—A Study of a Post-Discharge Programme for Elderly Patients. *International journal of integrated care*. Apr, 2016; 16(2).
 10. TEDESCO GW, MCCONAHA JL, SKOMO ML and HIGGINBOTHAM SK.: A pharmacist's impact on 30-day re-admission rates when compared to the current standard of care within a patient-centered medical home: a pilot study. *Journal of pharmacy practice*. Aug, 2016; 29(4): 368-73.
 11. POLINSKI JM, MOORE JM, KYRYCHENKO P, et al.: An insurer's care transition program emphasizes medication reconciliation, reduces readmissions and costs. *Health Aff (Millwood)*, 2016; 35(7): 1222–1229.
 12. RENNKE S and RANJANI SR.: Transitional care strategies from hospital to home: a review for the neurohospitalist. *Neurohospitalist*, 2015; 5(1): 35–42.
 13. LEE KH, LOW LL, ALLEN J, et al.: Transitional care for the highest risk patients: findings of a randomised control study. *Int J Integr Care*, 2015; 15: e039.
 14. VOGELSMEIER A, PEPPER GA, ODERDA L and WEIR C.: Medication reconciliation: a qualitative analysis of clinicians' perceptions. *Res Social Adm Pharm*, 2013; 9(4): 419–430.
 15. World Health Organization (WHO). Patient safety solutions preamble. WHO Collaborating Centre for Patient Safety Solutions, 2007. Available from: <https://www.who.int/patientsafety/solutions/patientsafety/Preamble.pdf?ua=1>. Accessed May28, 2020.
 16. SPINOWINE A, CLAEYS C, FOULON V and CHEVA-
LIER P.: Approaches for improving continuity of care in medication management: a systematic review. *Int J Qual Health Care*, 2013; 25(4): 403–417.
 18. SETTER SM, CORBETT CF and NEUMILLER JJ.: Transitional care: exploring the home healthcare nurse's role in medication management. *Home Healthc Nurse*, 2012; 30(1): 19–26.
 19. JENCKS SF, WILLIAMS MV and COLEMAN EA.: Rehospitalizations among patients in the Medicare fee-for-service program. *N Engl J Med*, 2009; 360(14): 1418–1428.
 20. TAM VC, KNOWLES SR, CORNISH PL, FINE N, MARCHESEANO R and ETCHELLES EE.: Frequency, type and clinical importance of medication history errors at admission to hospital: a systematic review. *Cmaj*, 2005; 173(5): 510–515.
 21. MEKONNEN AB, ABEBE TB, MCLACHLAN AJ and BRIEN JA.: Impact of electronic medication reconciliation interventions on medication discrepancies at hospital transitions: a systematic review and meta-analysis. *BMC medical informatics and decision making*. Dec, 2016; 16: 1-4.
 22. CORBETT CF, SETTER SM, DARATHA KB, NEUMILLER JJ and WOOD LD.: Nurse identified hospital to home medication discrepancies: implications for improving transitional care. *Geriatr Nurs*, 2010; 31(3): 188–196.
 23. HELLSTRÖM LM, BONDESSON Å, HÖGLUND P and ERIKSSON T.: Errors in medication history at hospital admission: prevalence and predicting factors. *BMC Clin Pharmacol*, 2012; 12: 9.
 24. HUYNH C, WONG IC, TOMLIN S, et al.: Medication discrepancies at transitions in pediatrics: a review of the literature. *Paediatr Drugs*, 2013; 15(3): 203–215.
 25. RIORDAN CO, DELANEY T and GRIMES T.: Exploring discharge prescribing errors and their propagation post-discharge: an observational study. *Int J Clin Pharm*, 2016; 38(5): 1172–1181.
 26. HAO S, JIN BO, SHIN AY, ZHAO Y, ZHU C, LI Z, HU Z, FU C, JI J, WANG Y and ZHAO Y.: Risk prediction of emergency department revisit 30 days post discharge: a prospective study. *PloS one*. Nov, 2014; 13, 9(11): e112944.
 27. CHOO J, HUTCHINSON A and BUCKNALL T.: Nurses' role in medication safety. *J Nurs Manag*, 2010; 18(7): 853–861.
 28. GUNADI S, UPFIELD S, PHAM N-D, YEA J, SCHMIEDEBERG MB and STAHLER GD.: Development of a collaborative transitions-of-care program for heart failure patients. *Am J Health Syst Pharm*, 2015; 72(13): 1147–1152.
 29. CAMICIA M and LUTZ BJ.: Nursing's role in successful transitions across settings. *Stroke*, 2016; 47(11): e246–e249.
 30. WEEKS LE, MCINNIS-PERRY G, MACQUARRIE C and JOVANOVIC S.: Insights into roles for health-care professionals in meeting the needs of older adults and unpaid caregivers during health-care transitions. *Canadian Journal of Nursing Research*, 2016; 48(3-4): 70-9, 2016.
 31. VAUGHN S, MAUK KL, JACELON CS, et al.: The competency model for professional rehabilitation nursing. *Rehabil Nurs*, 2016; 41(1): 33–44.
 32. SMITH M.: Transitional care clinics: an innovative approach to reducing readmissions, optimizing outcomes and improving the patient's experience of discharge care—conducting a feasibility study. *J Nurs Educ Pract*, 2016; 6(6): 34.
 33. AROMATARIS E and PEARSON A.: The systematic review: an overview. *Am J Nurs*, 2014; 114(3): 53–58.
 34. DEEKS JJ, HIGGINS J, ALTMAN DG and GREEN S.: *Cochrane handbook for systematic reviews of interventions version 5.1.0* (updated March 2011). The Cochrane Collaboration, 2011; 2.

35. LIBERATI A, ALTMAN DG, TETZLAFF J, et al.: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med.*, 2009; 6(7): e1000100–e1000100.
36. THOMAS J, HARDEN A, OAKLEY A, et al.: Integrating qualitative research with trials in systematic reviews. *BMJ*, 2004; 328(7446): 1010–1012.
37. SARKIS-ONOFRE R, CENCI MS, DEMARCO FF, LYNCH CD, FLEMING PS, PEREIRA-CENCI T and
38. MOHER D.: Use of guidelines to improve the quality and transparency of reporting oral health research. *Journal of dentistry*, 2015; 1, 43(4): 397–404.
39. HAWKER S, PAYNE S, KERR C, HARDEY M and POW- ELL J.: Appraising the evidence: reviewing disparate data systematically. *Qual Health Res*, 2002; 12(9): 1284–1299.
40. HART C, PRICE C, GRAZIOSE G and GREY J.: A pro- gram using pharmacy technicians to collect medication histories in the emergency department. *Pharmacy and Therapeutics*. Jan, 2015; 40(1): 56.
41. CHHABRA PT, RATTINGER GB, DUTCHER SK, HARE ME, PARSONS KL and ZUCKERMAN IH.: Medication reconciliation during the transition to and from long-term care settings: a systematic review. *Res Soc Admin Pharm*, 2012; 8(1): 60–75.
42. CHAN C, WOO R, SETO W, PONG S, GILHOOLY T and RUSSELL J.: Medication reconciliation in pediatric cardi- ology performed by a pharmacy technician: a prospective cohort comparison study. *Can J Hosp Pharm*, 2015; 68(1): 8–15.
43. LOVELACE D, HANCOCK D, HUGHES SS, et al.: Care Case management program: taking case management to the streets and beyond. *Prof Case Manag*, 2016; 21(6): 277–290.
44. MITCHELL SE, MARTIN J, HOLMES S, VAN DEUS- EN LUKAS C, CANCINO R, PAASCHE- ORLOW M, BRACH C and JACK B.: How hospitals reengineer their discharge processes to reduce readmissions. *The Journal for Healthcare Quality (JHQ)*, 2016; 1, 38(2): 116–26.
45. TOYE C, MATTHEWS A, HILL A and MAHER S.: Experiences, understandings and support needs of family carers of older patients with delirium: a descriptive mixed methods study in a hospital delirium unit. *International journal of older people nursing*. Sep, 2014; 9(3): 200–8.
46. REIDT SL, HOLTAN HS, LARSON TA, et al.: Inter professional collaboration to improve discharge from skilled nursing facility to home: preliminary data on post discharge hospitalizations and emergency department visits. *J Am Geriatr Soc*, 2016; 64(9): 1895–1899.
47. VOGELSMEIER A.: Identifying medication order discrepancies during medication reconciliation: perceptions of nursing home leaders and staff. *J Nurs Manag*, 2014; 22(3): 362–372.
48. PLAKIOTIS C, BELL JS, JEON YH, POND D and O'CONNOR DW.: Deprescribing psychotropic medications in aged care facilities: the potential role of family members. *GeNeDis*, 2015; 2014: 29–43.
49. HAMMOUR KA, FARHA RA and BASHETI I.: Hospital pharmacy medication reconciliation practice in Jordan: perceptions and barriers. *Journal of evaluation in clinical practice*. Dec, 2016; 22(6): 936–41.
50. MANIAS E, GERDTZ M, WILLIAMS A and DOOLEY M.: Complexities of medicines safety: communicating about managing medicines at transition points of care across emergency departments and medical wards. *J Clin Nurs*, 2015; 24(1–2): 69–80.
51. SQUIRES JE, HOBEN M, LINKLATER S, CARLETON HL, GRAHAM N and ESTABROOKS CA.: Job satisfaction among care aides in residential long-term care: A systematic review of contributing factors, both individual and organizational. *Nursing research and practice*, 2015; (1): 157924.
52. YI LJ, SHUAI T, TIAN X, ZENG Z, MA L and SONG GM.: The effect of subcutaneous injection duration on patients receiving low-molecular-weight heparin: Evidence from a systematic review. *International Journal of Nursing Sciences*. Mar, 2016; 1, 3(1): 79–88.
53. LARDON J, ABDELLAOUI R, BELLET F, ASFARI H, SOUVIGNET J, TEXIER N, JAULENT MC, BEYENS MN, BURGUN A and BOUSQUET C.: Adverse drug reaction identification and extraction in social media: a scoping review. *Journal of medical Internet research*, 2015; 10, 17(7): e171.
54. ENSING HT, STUIJT CC, VAN DEN BEMT BJ, et al.: Identifying the optimal role for pharmacists in care transitions: a systematic review. *J Manag Care Spec Pharm*, 2015; 21(8): 614–636.
55. KWAN JL, LO L, SAMPSON M and SHOJANIA KG.: Medication reconciliation during transitions of care as a patient safety strategy: a systematic review. *Ann Intern Med*, 2013; 158(5Pt 2): 397–403.
56. ENSING HT, STUIJT CC, VAN DEN BEMT BJ, VAN DOOREN AA, KARAPINAR-ÇARKIT F, KOSTER ES
57. and BOUVY ML.: Identifying the optimal role for pharmacists in care transitions: a systematic review. *Journal of managed care & specialty pharmacy*. Aug, 2015; 1, 21(8): 614–38.
58. ALMANASREH E, MOLES R and CHEN TF.: The medication reconciliation process and classification of discrepancies: a systematic review. *Br J Clin Pharmacol*, 2016; 82(3): 645–658.
59. LEE KP, HARTRIDGE C, CORBETT K, VITTINGHOFF E and AUERBACH AD.: “Whose job is it, really?” Physicians’, nurses’, and pharmacists’ perspectives on completing inpatient medication reconciliation. *J Hosp Med*, 2015; 10(3):

184–186.

60. VAN SLUISVELD N, ZEGERS M, NATSCH S and WOL- LERSHEIM H.: Medication reconciliation at hospital admission and discharge: insufficient knowledge, unclear task reallocation and lack of collaboration as major barriers to medication safety. BMC Health Serv Res, 2012; 12: 170.