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REFLECTION ARTICLE

Safe use of medications: an approach from the nursing process

Uso seguro de medicamentos: una aproximación desde el proceso de enfermería

Utilização segura de medicamentos: uma abordagem a partir do processo de enfermagem

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ABSTRACT

Objective: To reflect on the proposed integration of the nursing process with pharmacology to promote patient safety in clinical practice. **Development:** Medications are essential for health care, the treatment of diseases, and the prevention of complications. However, their widespread use has contributed to public health problems, such as inappropriate use, adverse reactions, medication errors, and negative events, which can undermine therapeutic goals and result in undesirable effects. It is widely recognized that nurses not only administer medications, but also play a crucial role in promoting their safe use, preventing errors, and supporting patients and their families. This is achieved by implementing objective care plans, reflecting a commitment to clinical excellence and person-centered care. In this context, the nursing process serves as a systematic framework that ensures and promotes evidence-based nursing interventions and actions. Conversely, pharmacology provides a comprehensive understanding of medications, requiring mastery of pharmacokinetics and pharmacodynamics to deliver individualized care that addresses identified needs. **Conclusions:** By adopting a systematic and holistic approach that encompasses the initial assessment of individuals and their medications, along with the ongoing evaluation of patient outcomes and responses, nursing professionals can identify and mitigate potential risks associated with medication use.

Keywords: Nursing Process; Medication Therapy Management; Patient Safety.

RESUMEN

Objetivo: Reflexionar sobre la propuesta de integración del proceso enfermero con la farmacología para promover la seguridad del paciente en la práctica clínica. **Desarrollo:** Los medicamentos son fundamentales para el cuidado de la salud, el tratamiento de enfermedades y la prevención de complicaciones. Sin embargo, su uso generalizado ha contribuido a generar problemas de salud pública, como el uso inadecuado, reacciones adversas, errores de medicación y eventos adversos, que pueden limitar los objetivos terapéuticos y causar efectos no deseados. Se reconoce que las enfermeras no solo administran medicamentos, también promueven su uso seguro, previenen errores y apoyan a los pacientes y sus familias, sustentados en planes de cuidado objetivos, demostrando un compromiso continuo con la excelencia clínica y el cuidado centrado en la persona. En este sentido, emerge el proceso enfermero como estructura sistemática que garantiza y promueve intervenciones y acciones de enfermería con fundamentación científica, por otro lado, la farmacología ofrece una comprensión integral de los medicamentos y exige dominar conceptos de farmacocinética y farmacodinamia para proporcionar un cuidado individualizado que responda a las necesidades identificadas. **Conclusiones:** Al adoptar un enfoque sistemático y holístico que abarque desde la valoración inicial de las personas y el medicamento, hasta la evaluación continua de resultados y respuestas humanas, los profesionales de enfermería pueden identificar y mitigar riesgos potenciales asociados con el uso de medicamentos.

Palabras claves: Proceso de Enfermería; Administración del Tratamiento Farmacológico; Seguridad del Paciente.

RESUMO

Objetivo: Refletir sobre a proposta de integração do processo de enfermagem com a farmacologia para promover a segurança do doente na prática clínica. **Desenvolvimento:** Os medicamentos são fundamentais para os cuidados de saúde, o tratamento de doenças e a prevenção de complicações. No entanto, a sua utilização generalizada tem contribuído para problemas de saúde pública como o uso inadequado, reações adversas, erros de medicação e acontecimentos adversos, que podem limitar os objetivos terapêuticos e causar efeitos indesejáveis. Reconhece-se que os enfermeiros não só administram medicamentos, como também promovem a sua utilização segura, previnem erros e apoiam os doentes e as suas famílias, sustentados por planos de cuidados objetivos, demonstrando um compromisso permanente com a excelência clínica e com os cuidados centrados na pessoa. Neste sentido, o processo de enfermagem surge como uma estrutura sistemática que garante e promove intervenções e ações de enfermagem com base científica; por outro lado, a farmacologia oferece uma compreensão abrangente dos medicamentos e requer o domínio de conceitos farmacocinéticos e farmacodinâmicos para prestar cuidados individualizados que respondam às necessidades identificadas. **Conclusões:** Ao adotar uma abordagem sistemática e holística desde a avaliação inicial dos indivíduos e da medicação até à avaliação contínua dos resultados e das respostas humanas, os profissionais de enfermagem podem identificar e atenuar os riscos potenciais associados à utilização da medicação.

Palavras-chave: Processo de Enfermagem; Conduta do Tratamento Medicamentoso; Segurança do Paciente.

INTRODUCTION

The evolution of humanity has been accompanied and influenced by the use of substances to maintain well-being. Initially, these substances were obtained directly from animals and plants; however, scientific advances resulting from studies and experiments have led to the development of chemical and biological substrates with active ingredients. Some of these substances can even modify genetic sequences,[1] and are commonly referred to as medications or drugs. In some countries, the term "remedy" is also accepted.[2]

Medications play a crucial role in human healthcare due to their relevance in medical treatment, disease management, and the prevention of complications.[1] However, their widespread use has become a significant concern in public health due to inappropriate use, adverse reactions, medication errors, and negative treatment outcomes.[2]

These issues hinder therapeutic goals and can result in undesirable effects for patients, ranging from mild adverse reactions and drug resistance to death. Consequently, there is an increase in healthcare costs, social costs, and a decline in trust in medications, healthcare providers, and healthcare institutions.[2]

Due to the above, patient safety is a fundamental pillar of contemporary healthcare, and maintaining it is a shared responsibility among all healthcare professionals.[3, 4] Within this framework, the safe use of medications emerges as a critical aspect, as errors in prescribing, dispensing, and administering drugs can have serious consequences for the health of patients.[3]

Pharmacology provides a comprehensive understanding of medications, their expected effects, and potential risks. From pharmacokinetics to pharmacodynamics, nursing professionals must master a wide range of concepts to make informed decisions and deliver individualized care.[4]

In this context, the nursing process serves as a bridge connecting theoretical knowledge with clinical practice, facilitating a coherent and reflective application of pharmacological principles in patient care.[5]

However, this relationship extends beyond the administration of medications. The nursing process also encompasses comprehensive patient assessment, individualized care planning, implementing therapeutic interventions, and continuous outcome evaluation.[5] In each of these stages, pharmacology plays a fundamental role by influencing clinical decisions, treatment selection, and monitoring of therapeutic responses.[6]

Nursing professionals play a vital role not only in administering medications but also in promoting their safe use, preventing errors and adverse events, and providing comprehensive support to patients and their families. This integration of knowledge, skills, and values reflects the ongoing commitment of nursing to clinical excellence and person-centered care.

This exploration proposes the intersection of pharmacology and the nursing process as an opportunity to reflect on the holistic nature of nursing practice and patient safety in the use of medications.

The objective of this document is to consider the integration of the nursing process with pharmacology to promote patient safety in clinical practice.

DEVELOPMENT

Medication Without Harm

Medications are essential for managing both acute and chronic diseases and play a significant role in impacting human health. The proper storage, administration, and monitoring of these compounds

involve a series of complex stages, during which favorable or unfavorable outcomes may arise, influenced by various factors associated with their use.[3,6]

In an effort to control medication errors, the World Health Organization (WHO) has, over the past decade, proposed various strategies and interventions to promote safety in hospital care. Their latest global patient safety initiative, "Medication Without Harm," represents a significant effort to address adverse events related to medication use.[7]

This strategy is based on evidence showing that errors can occur at all stages of the medication process and may involve human mistakes as well as environmental and structural factors, such as staffing shortages. These elements can trigger incidents and adverse events during patient care in hospitals.[6,7]

The process of medication use is seen as highly complex and consists of multiple stages (Table 1), which may vary between institutions. However, it is evident that in more than half of these stages, the responsibility of medication administration falls primarily on nursing staff.

It is estimated that between 20 and 60 different procedures are involved in the stages of prescribing, dispensing, and administering medications, requiring multidisciplinary collaboration.[7]

Table 1. Stages of Medication Use in Hospital Settings

Stage	Description
Prescription	The physician assesses the patient and determines which medication will promote the recovery of well-being, prevent complications, or control a symptom. A prescription is made, and the medication is requested from the pharmacy or medication dispensing system.
Dispensation	Pharmacy staff may deliver the medication directly to the person responsible for administration or their designated handler.
Preparation	Nursing professionals prepare the medication (e.g., reconstitute it, extract it from a vial, place it in a labeled syringe, dilute it, etc.).
Administration	The medication is administered by the nursing professional, following the hospital's administration protocols.
Documentation	The nursing professional must document the administration process chronologically in the hospital's information system, including the dose, route, and materials used.
Monitoring	The nursing professional must monitor relevant vital signs or laboratory tests after medication administration (e.g., checking glucose levels after insulin administration).

Adapted from: Seger DL. Evaluation of Perioperative Medication Errors and Adverse Drug Events. Anesthesiology. 2016.[7]

Errors in medication use are not limited to situations involving drugs with a narrow therapeutic range, high concentration, or those requiring strict monitoring.[8]

Medication-related errors and negative reactions are among the most common adverse events during hospital care and can occur in any healthcare service that involves medication prescribing, dispensing, administration, and monitoring. Consequently, hospitalized patients are at a high risk of experiencing medication errors.[3,9]

According to numerous reports, the likelihood of medication errors is significantly high during the stages of prescribing, preparation, and administration. It is estimated that approximately 67% of prescriptions present mistakes.[10,11] Additionally, errors in the other two stages frequently involve nursing staff, as medication use is a central part of their direct care activities.[12-14]

Nursing Process

As previously mentioned, nursing professionals play a central role in coordinating care within healthcare teams, influencing the prevention of complications and the recovery of patient's well-being through interventions that often include administering medications via various routes.[15]

The nursing process is a systematic approach that applies the scientific method, representing the foundation of modern nursing's comprehensive patient care actions.[4] This method has evolved since Hall first described it in 1955,[15] with subsequent modifications and adjustments proposed by various theorists, based on patients' biopsychosocial needs and the advances in healthcare.

It was not until 1973 that the nursing process incorporated its five recognized stages: assessment, diagnosis, planning, implementation, and evaluation.[15] The process involves activities such as data collection, problem identification, and determining the type of care that is needed based on physical, mental, social, and environmental perspectives.

The application of the nursing process has influenced the development of the profession, not only by providing a guide for clinical practice but also by promoting holistic and bespoke care that addresses the patient's physical, emotional, social, and spiritual needs.[16]

It has also proven useful in implementing patient safety programs, as it supports the development of planned interventions and activities based on international taxonomies such as the Nursing Outcomes Classification (NOC) and Nursing Intervention Classification (NIC), thus enhancing the quality of care delivered through the nurse-patient relationship.[15]

The nursing process, with its five stages focused on comprehensive care, precise diagnosis, careful planning, competent implementation, and continuous evaluation of human responses, not only improves health outcomes but also promotes and strengthens the safe use of medications.[15-18]

This aligns with the International Council of Nurses' assertion that medication use is a core competency in nursing, integral to the essential and ongoing functions of the profession.[17]

Integration of the Nursing Process in Safe Medication Use

As mentioned, safe medication use is a fundamental aspect of clinical practice, aiming to maximize therapeutic benefits while minimizing risks to patient health.[18–20]

In this sense, the application of the nursing process to enhance safety during the stages of medication use that involve nursing professionals can lead to better outcomes in preventing incidents and adverse events related to medication errors.

Therefore, the nursing process is proposed not only as a way to ensure the objective care of individuals and families but also to promote the safe use of medications:

1. **Comprehensive Patient Assessment:** The first stage of the nursing process involves a thorough evaluation of the patient, which goes beyond simply collecting demographic information and symptoms.

In the context of medication use, this assessment includes identifying individual risk factors such as allergies, comorbidities, medication history, and patient preferences. It is also important to consider psychosocial and family aspects that may influence treatment adherence and patient safety.[18,19]

Furthermore, the assessment should consider the pharmacokinetic characteristics of the medication, such as pH, osmolarity, dosage, routes and frequency of administration, available formulations, absorption, distribution, metabolism, elimination, half-life, indications, and contraindications.

2. **Proposed Nursing Diagnosis:** Nursing diagnoses categorize human responses, and since medications elicit human responses, integrating different types of diagnoses—problem-

focused, health promotion, and risk-based—can help direct care towards a response associated with the therapeutic or adverse effects of the medication.[16]

For example, when administering opioids, an expected response that must be monitored is pain control. Therefore, the patient's response can be identified, according to the North American Nursing Diagnosis Association (NANDA-I), as [00132] Acute Pain.[16]

3. **Personalized Care Planning:** Based on the information gathered during the assessment and following the diagnosis, specific goals should be established to address the patient's needs related to medication use.

In this stage, the aim is to determine "how" the patient's human response will be modified.[21]

Continuing with the example, the objectives [1605] Pain Control and [160511] Reports Pain Controlled, associated with the Nursing Outcomes Classification (NOC), can be proposed in line with the diagnosis.[21]

Additionally, the care plan should include the appropriate selection of medications according to their available formula and the biomedical devices required for safe reconstitution, dilution, and dosage calculation. It is also essential to identify strategies for minimizing risks, such as proper syringe and solution labeling, continuous monitoring of vital signs and neurological status during administration, and preventing drug interactions.[20,21]

4. **Rigorous Implementation and Continuous Supervision:** During medication administration, nursing professionals must adhere to standardized institutional protocols to ensure patient safety.

This involves verifying the patient's identity, confirming the medical prescription, complying with the designated time for administration, and following protocols regarding the speed, volume, and safety of administration via different routes.[22]

Moreover, education should be provided to the patient and their family about the correct use of medications, the importance of therapeutic adherence, and specifically regarding the medication being administered, its frequency, and the expected therapeutic and adverse effects.[6]

In this regard, consulting the NIC is beneficial, as it outlines all the interventions and activities that nursing professionals can perform, such as intervention [2210] Administration of Analgesics.[23]

5. **Continuous Monitoring and Outcome Evaluation:** After administering medication, nursing professionals carry out a systematic evaluation of the patient's physical and psychological responses, as well as the results obtained.[21,23]

To conclude the example, the professional evaluates certain indicators to confirm the proposed goal has been achieved.

This allows for the early detection of any adverse effects or lack of therapeutic efficacy and enables corrective actions to be taken as necessary. Furthermore, continuous learning and improvement of practices are fostered through incident reviews, patient feedback, and participation in quality assurance programs.[3,22]

CONCLUSIONS

The effective integration of the nursing process in the care of people receiving medications is essential for ensuring safety and quality of care.

By adopting a systematic and holistic approach that spans from the initial assessment of patients and medications to the continuous evaluation of outcomes, nursing professionals can identify and mitigate potential risks associated with medication use.

This approach not only reduces the incidence of errors and adverse effects but also promotes patient-centered care that is evidence-based and oriented toward positive outcomes.

Ultimately, the diligent application of the nursing process in clinical practice contributes to enhancing the safety of care and strengthens the efficacy of medications, staff, and the healthcare system as a whole.

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