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QUALITY INDICATORS FOR QUALITY OPTIMIZATION IN HOSPITAL PHARMACY

Indicadores de qualidade para otimização da qualidade em farmácia hospitalar

Indicadores de calidad para la optimización de la calidad en farmacia hospitalaria

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ABSTRACT

Objective: to identify, from scientific publications, quality indicators for optimizing management in hospital pharmacy. **Method:** integrative review with bibliographic survey in the databases Scopus, We of Science and Medline, between 2019 and 2023, using the descriptors Patient Safety, Quality Indicators and Pharmacy Service. Documents were included in Portuguese, English and Spanish, with abstracts available in the selected databases and available in full at no cost. The adapted CASP tool was used to analyze the documents. **Results:** 15 documents were identified in Web of Science, 24 in Scopus and two in Medline with the theme addressed in the topic. **Conclusion:** the most frequently reported quality management tools were those related to root cause definition. The quality indicators used to monitor the results were mainly satisfaction of the work team, time spent performing the activities, and reduction of errors and costs.

DESCRIPTORS: Quality indicators; Pharmacy service; Patient safety.

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RESUMO

Objetivo: identificar, a partir de publicações científicas, indicadores de qualidade para a otimização da gestão em farmácia hospitalar. **Método:** revisão integrativa com levantamento bibliográfico nas bases de dados Scopus, We of Science e Medline, entre 2019 e 2023, utilizando os descritores Patient Safety, Quality Indicators e Pharmacy Service. Foram incluídos documentos em português, inglês e espanhol, com os resumos disponíveis nas bases de dados selecionadas e disponíveis na íntegra sem custos. Para análise dos documentos, aplicou-se a ferramenta CASP adaptada. **Resultados:** foram identificados 15 documentos na Web of Science, 24 na Scopus e dois na Medline com a temática abordada no tópico. **Conclusão:** as ferramentas de gestão da qualidade mais frequentemente reportadas foram as relacionadas com a definição da causa raiz. Os indicadores de qualidade utilizados para monitorar os resultados foram, principalmente, satisfação da equipe de trabalho, tempo gasto na execução das atividades e redução de erros e custos.

DESCRITORES: Indicadores de qualidade; Serviço de farmácia; Segurança do paciente.

RESUMEN

Objetivo: identificar, a partir de publicaciones científicas, indicadores de calidad para optimizar la gestión en farmacia hospitalaria. **Método:** revisión integrativa con levantamiento bibliográfico en las bases de datos Scopus, We of Science y Medline, entre 2019 y 2023, utilizando los descriptores Seguridad del Paciente, Indicadores de Calidad y Servicio de Farmacia. Se incluyeron documentos en portugués, inglés y español, con resúmenes disponibles en las bases de datos seleccionadas y disponibles en su totalidad sin costo. Para el análisis de los documentos se utilizó la herramienta CASP adaptada. **Resultados:** foram identificados 15 documentos na Web of Science, 24 na Scopus e dois na Medline com a temática abordada no tópico. **Conclusión:** las herramientas de gestión de la calidad más utilizadas fueron las relacionadas con la definición de la causa raíz. Los indicadores de calidad utilizados para monitorizar los resultados fueron principalmente la satisfacción del equipo de trabajo, el tiempo empleado en la realización de las actividades y la reducción de errores y costes.

DESCRIPTORES: Indicadores de calidad; Servicio de farmacia; Seguridad del paciente.

INTRODUCTION

Health care in the hospital environment in a safe and harm-free manner was highlighted in the national and international scientific literature, as from the report published by the Institute of Medicine of the United States of America (USA) in 1999, whose title is "To Err is Human – Building a Safer Health System". Through this important document, it was revealed that between 44,000 and 98,000 Americans died each year in the United States of America – USA, as a result of adverse events, with 7,000 deaths related to medication errors.[1]

In view of this fact, public authorities, researchers, health professionals, and the organized civil society have undertaken discussions involving the subject of patient safety. These discussions have increased significantly over the years and have been transforming the way health care is thought and developed in Brazil and worldwide.

The search for the identification of priority areas in patient safety, the creation of policies directed to this theme, such as, for example, the National Program for Patient Safety (PNSP) in Brazil, as well as, in the international scenario, the creation of international organizations directed to the safety area, together with the production of scientific knowledge, emphasize the impact that patient safety has on health systems, including the financial impact, above all, in a system that intends to be universal, as is the case of the Unified Health System – SUS.

Situations that culminate in errors or failures in health care are called incidents, which may or may not cause iatrogenesis to the patient. An example of error or failure in health care is the Adverse Event (AE), an incident that affects the patient and results in damage or injury. An adverse event has the potential to cause temporary or permanent damage and even lead the patient to death (BRASIL, 2017).[2] In the Brazilian health system, adverse events have mandatory notifications since June 2014, are recorded in the Notification System for Health Surveillance (Notivisa) version 2.0, being the responsibility of the National Health Surveillance Agency (ANVISA).[3]

Health care and the process of care provide numerous challenges for health care professionals. Among the main challenges are the search for excellence, meeting regulatory requirements, user safety and satisfaction, and appropriate cost management. Quality is a fundamental aspect in any type of product or service, but in the medication process it becomes essential, because it is directly related to patient safety.[4-6]

The hospital pharmacy, whose pharmacist is the technical responsible, is a unit where activities related to pharmaceutical assistance are processed. It is part of the organizational structure of the hospital, functionally integrated with the other administrative and patient care units, and its management is based on tools for quality assessment.

Information needed to measure the quality of a process can be obtained at the input and output, or during the entire process itself, if related to service satisfaction. Performance measures communicate strategy, results, control, and process improvement.[5]

Tools are techniques used to define, measure, analyze, and propose solutions to problems that interfere with good work

process performance. These tools involve a broad approach to analysis and can be used alone or in combination. They include flow mapping, process risk assessment, searching for root causes of a problem, and designing interventions focused on continuous improvement or damage minimization of established problems. Some of the most common quality tools are the Pareto chart, the cause and effect diagram, and the Lean Six Sigma technique.[4]

Key and necessary information and data required to measure the quality of a process can be obtained at the input and output, or throughout the process itself if related to service satisfaction.[7-8] Performance measures communicate strategy, results, control, and process improvement. In this context, performance indicators emerge, which according to the World Health Organization (WHO) are markers of the health situation and of the performance of services or availability of resources defined to allow monitoring of objectives, targets, and performances. An indicator is also a parameter that is easily measurable and representative of the work performed in a given activity.[9]

The use of indicators allows the establishment of standards, as well as the follow-up of their evolution over the years. Its function is to highlight the need for improvement actions, and to verify whether the implemented actions are producing the desired effects. However, the follow-up of a single indicator does not make it possible to know the reality and its complexity, and the association of several indicators is required.[10]

This research is justified by the fact that indicators should be selected based on controllable or managerial results of the process, that is, those for which the professionals involved have responsibility and can act on their causes, correcting deviations and improving results, because the hospital pharmacy is considered a strategic unit within the hospital organization, thus, improvements in pharmacy processes may have significant impact on the performance of user care.

The objective of this work is to trace an analysis about the knowledge already built in previous researches about the set of indicators that must be followed up by the management of the Hospital pharmacy, focusing on the assistance and safety of the patient.

METHOD

This is a bibliographic, descriptive, integrative literature review, a specific method, whose objective is to analyze the knowledge already built up in previous research on a given topic, thus enabling the synthesis of several publications and allowing the generation of new knowledge, based on the results presented by previous research. Thus, the methodological path was defined in six stages.[11]

In the first, the acronym PICo12 was used to construct the guiding question, with P being the population (psychiatric inpatients), I the phenomenon of interest (quality of hospital pharmacy services) and Co the context (psychiatric hospital). The following question was then listed: what are the main experimental and nonexperimental studies that can be the basis for quality indicators for hospital pharmacy management? Then, the search strategies and databases were defined.

The electronic bibliographic survey occurred by using the descriptors: Patient safety, Quality indicators and pharmacy service. These descriptors were extracted from the Health Sciences Descriptors Portal (DeCS). The result of the use of these descriptors was an extensive mapping performed in the databases of the Virtual Health Library (VHL) Regional Portal, having its main structuring done in the Scopus, Web of Science, and Medical Literature Analysis and Retrieval System on-line (Medline) databases.

For each database, the Boolean operator AND was used (to intersect the terms in the search strategy), with the objective of making the association of the descriptors in the databases. Medline used the string ((patient safety[Title/Abstract]) AND (quality indicators[Title/Abstract])) AND (pharmacy service[Title/Abstract]). In Scopus, (TITLE-ABS-KEY (patient AND safety) AND TITLE-ABS-KEY (quality AND indicators) AND TITLE-ABS-KEY (pharmacy AND service)) AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019)) and lastly in Web of Science: Patient safety (Topic) and Quality indicators (Topic) and Pharmacy service (Topic).

For analysis, documents that met the following criteria were included: published in Portuguese, English and Spanish, with abstracts available in the selected databases, in the period between 2019 and 2023, available in full, online in the chosen databases, without costs to obtain and that addressed the topic of quality indicators for hospital pharmacy management.

The exclusion criteria were abstracts in annals of events and expanded abstracts. Duplicate documents were also excluded. Information retrieval from the databases was performed independently by the researchers in April 2023.

In the search, the proposed period of 2019 to 2023 was used, considering that this investigation did not retrieve information, concepts, or ideas that could, perhaps, be obsolete or inaccurate, negatively affecting validity and judgments. Obsolete knowledge can even affect the external validity of future studies that use it as a reference.[13-14]

Next, a pre-selection of the documents was made by reading the title and abstract, according to the guiding question and the inclusion and exclusion criteria previously defined. To evaluate the methodological quality of the included documents, the instrument adapted from the Critical Appraisal Skills Programme was applied.[15] At the end of the evaluation, only the publications classified with good methodological quality and reduced bias remained.

For data collection of the documents, an instrument was developed by the reviewers themselves, based on a validated instrument[12-14] containing the following items: author/year, study design, summary of the study in question and classification of the level of evidence according to Oxford.[13-14] The selection flowchart is shown in Figure 1.

The bibliographic survey in the databases resulted in the identification of 23 potentially relevant documents, and five (5) documents were excluded for duplicates. After the pre-selection with the application of the inclusion criteria, 10 (ten) documents were selected from which, after reading the titles and abstracts, 7 (seven) documents were accessed. Thus, the final sample was composed of 7 (seven) documents that were analyzed in their entirety.

To facilitate the analysis and synthesis of the papers, a synoptic table was built, consisting of the following items: authors, year of publication, study design, intervention, and level of evidence.

From this extraction, central elements and units of analysis of each article were evaluated, generating categorization by similarity of the subjects discussed. These categories are presented through a narrative synthesis.

RESULTS

The results are available in Figure 2, in summary table format, as well as the discussion, developed descriptively, enable the reader to evaluate the applicability of the integrative review prepared in order to achieve the objective from the proposed method.

As for the year of publication, in 2019 one document (14%), 2020 two documents (29%), 2021 one document (14%), 2022 two documents (29%), 2023 one document (14%). The average annual publication for the studied period represents 1.4 document per year.

DISCUSSION

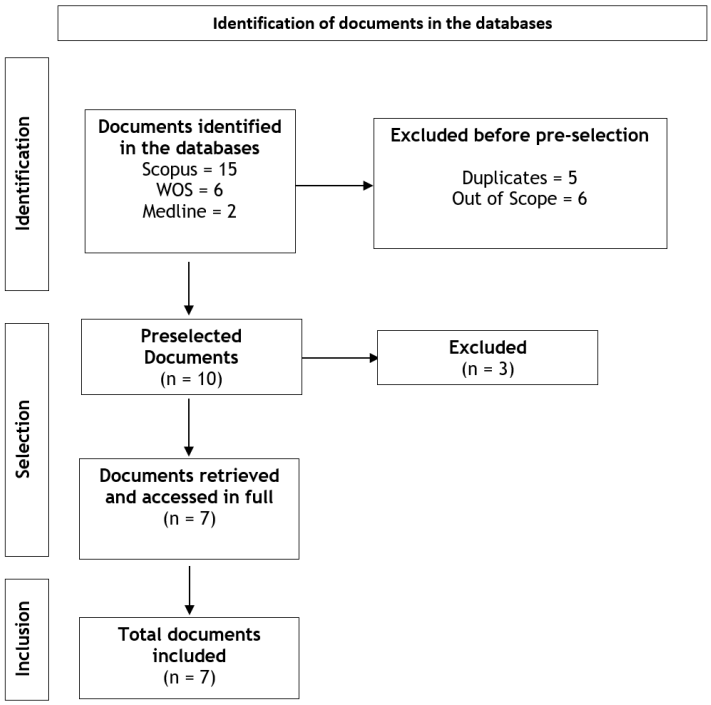
Although quite discretely, the national health system is moving toward value-based purchasing of professional services, also known as value-based health care, a movement that is widely disseminated and practiced in developed countries. This value can be described as the balance between quality and costs, and therefore can be increased and optimized, contributing to quality and therefore cost control in the healthcare system, whether public or private.[15]

Although Brazilian hospital pharmacies have not yet expressively experienced the demand for quality and value evidence, it is reasonable to say that this context will change in the near future, as the Federal Government and private purchasers expand their search for quality-related evidence to all sectors of health care, including users of the Unified Health System.[16-17]

The quality measures used to evaluate pharmacy management are standardized metrics that should be based on scientific evidence, with emphasis on data and statistical analysis, such as the percentage of individuals who received a dose higher than the prescribed daily dose, or dispensed drugs with known potential for drug interactions in cases where the patient takes other drugs concomitantly, a very common situation that is part of the daily life of inpatients, especially those undergoing psychiatric treatment.[18]

Despite the fact that administrative and scientific activities aimed at building and using concepts to measure quality of care are not new, there is a growing interest in evaluating medication-related quality from a patient safety perspective.

Figure 1 – Flowchart of the paper selection process



Source: survey results. Rio de Janeiro, 2023

Figure 2 – Summary table of the selected documents. Rio de Janeiro, RJ, Brazil, 2023.

Authors/Year	Study design	Intervention applied	Level of Evidence
Lima RF, etal/2020[16]	Quantitative Research	Cross-sectional study whose data collection was carried out from May to November 2016 and involved hospital characterization and hierarchization, evaluation of the PS according to indicators related to risk management in the use of medicines and calculation of percentages of compliance with the activities set out in the indicators (outcome variable) with subsequent correlation with variables that could influence their results through linear regression. https://doi.org/ 10.22239/2317-269x.01415	4
Matsunaga PAS, etal/2019[17]	Quantitative Research	This is a cross-sectional, quantitative study, conducted from February to July 2018, by double-checking drug prescriptions, based on the recommendations of the Institute for Safe Practices for Medication Use and the Safety Protocol on Prescription, Use and Administration of Drugs. https://doi.org/ 10.15343/0104-7809.20194303732746	4
Marlena O, etal/2022[18]	Quantitative Research	To assess whether the National Health Fund post-inspection reports would be a reliable source for evaluating the quality of pharmaceutical services provided by community pharmacies. https://doi.org/10.1186/s12913-022-07772-2	4
Reis AC, etal/2023[19]	Quantitative Research	This scoping review sought to describe the quality management tools applied to the dispensing of medications in ERs; quality indicators used and results obtained. https://doi.org/10.1016/j.sapharm.2022.11.008	4
Vivien B,et al/2021[20]	Quantitative Research	This single-center study included all interventions documented by CPs on five self-selected working days in 1 month using the validated online database DokuPIK (Documentation of Pharmacists' Interventions in the Hospital). Based on different workflows, two groups of CPs were compared. One group operated as part of the CLMM, the "Closed Loop Clinical Pharmacists" (CL-CPs), while the other group worked less dependent on the CLMM, the "Process Detached Clinical Pharmacists" (PD-CPs). Work experience and number of drug reviews were entered into an online survey. https://doi.org/10.3389/fphar.2022.1030406	4
Ryan C, et al/ 2020[21]	Quantitative Research	A comparison was made between existing PQMs used by DHA and all measures published and endorsed by the Pharmacy Quality Alliance (PQA), a recognized PQM standard setting organization. We also compared DHA's PQMs with those used in the Medicare Part D star rating program https://doi.org/10.1093/milmed/usz435	4
Noriko S, et al/2022[22]	Quantitative Research	To evaluate the measurement properties of 121 face and content validated quality indicators (QIs) for medication safety in geriatric pharmacotherapy in primary care. https://doi.org/10.1136/bmjopen-2022-066665	4

Source: survey results. Rio de Janeiro, 2023

As the health care system shifts from fee-for-service to value--driven health care, inexorably, interest in the use of quality metrics will increase, in pharmacy services it will be no different in medication-related quality metrics to assess quality and value within the health care system. In this context, the process of drug dispensing in hospital pharmacies (HPs) is one of the essential steps in safe health care, but it must be seen as a highly complex process, considering the participation of the multidisciplinary team involved in health care, and the clinical conditions of patients. Thus, the use of quality management tools becomes a fundamental strategy to improve patient safety and achieve institutional goals, including user satisfaction and cost reduction.[19]

The quality management tools most frequently reported in the documents retrieved in this review were those related to root cause definition, in particular DMAIC (Define, Measure, Analyze, Improve, and Control) and the cause and effect diagram; tools for risk management, such as FMEA (Failure Mode and Effect Analysis) and its variations; and tools related to LSS (LEAN Six Sigma) principles. The quality indicators used to monitor the results were mainly staff satisfaction, time spent performing the activities, and reduction of errors and costs.[18-19]

A study developed in Brazil aimed to select indicators that should be followed up by the pharmaceutical assistance division in a large university hospital. The selection of performance indicators was guided by the premise that the indicator must be accessible or be obtained in a short period of time and without requiring much work, and also have its usefulness recognized by other players involved in the evaluation.[21]

An important aspect involving the use of quality indicators for hospital pharmacies is the accreditation system, since it is a voluntary, periodic and reserved form of evaluation and certification of the quality of health services provided, by means of duly accepted and established standards. The criteria may be minimal or more demanding, defining different levels of satisfaction and qualification. It aims to encourage the development of a culture of constant improvement of quality in medical care.[22-25]

Research conducted by a pharmaceutical technology research center constructed 14 indicators. The developed indicators were applied to evaluate the quality of the pharmacy service of a Hospital located in Tubarão/SC. The study concluded that the quality of hospital pharmacy is directly related to pharmacovigilance and clinical pharmacy services. There were few studies related to the construction of specific indicators to evaluate the quality of hospital pharmacy, however, these indicators correspond to percentage indexes of the criteria evaluated, such as: medication errors are evaluated as "error rate", through the

ratio between the total number of errors and the total number of error opportunities.[25-27]

A literature survey conducted in 2022, studied quality indicators in hospital pharmacy from a cost perspective, based on medication waste. In its results, more than 70 indicators were listed, of which.[21-28] Although the study was carried out in the perspective of costs, some indicators can be used to measure the quality of hospital pharmacy: a) standard of the drugs supplied; b) general inventory and accuracy; c) traceability; d) temperature indicator; e) errors in the dispensing of drugs; f) staff training; g) lack of medication to the patient; h) rejected medical requests.

Undoubtedly, in the hospital context, the pharmacy performs several activities aiming at mitigating the risk of errors, corroborating and implementing a safety culture, from the safe and coherent use of medications, based on quality indicators of hospital pharmacy services.[25]

In the hospital care scenario, the multidisciplinary team is faced with multiple possibilities for errors, from the dispensing of medication, through the medical prescription, error in the dose, therapeutic duplicity, prescription of medication not indicated for the patient, pharmaceutical form, route of administration, interval, and inadequate infusion rate, and also to identify the errors related to the process of preparing the prescription, such as illegibility, use of abbreviations, omission of pharmaceutical form, concentration, route of administration, interval, error in the unit of medication, and others.

CONCLUSION

The most relevant findings involve quantitative clinical studies, most of them performed by nurses, pharmacists and physicians. However, the choice of indicators will depend on which aspects of management will be measured/monitored, the availability and quality of information, and the financial and human resources available and used for this purpose. The instruments, models and quality indicators in hospital pharmacy service should be considered by managers, facilitators of information democratization, achievement of goals and results, promoting an increasingly safer health care for the patient and health professionals directly involved in care.

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