

Exploring the integration of 4P healthcare principles into hospital management: A systematic review protocol

Exploration de l'intégration des principes de santé 4P dans le management hospitalier: Un protocole de revue systématique

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ABSTRACT

Introduction: At the present time, the major paradigm changes that are impacting hospitals are being driven by new technology, digitization, precision medicine and patient expectations. The 4P Health Care concept of Preventive, Predictive, Personalized and Participatory healthcare is now influencing how hospitals are being managed as well as how medical care is provided to patients. The main purpose of this systematic review is to identify, review, examine and synthesis the existing management practices, models and theories used in hospitals based on the 4P health care principles.

Methods: This systematic review will be conducted following the PRISMA guidelines. Databases to be searched include MEDLINE/PubMed, Scopus, Embase, Web of Science, Emerald Insight, and Google Scholar, combining keywords in English and French around '4P health' and 'hospital management'. Search terms will include the following keywords and terms: ("Hospitals"[MeSH] OR "Hospital Administration"[MeSH] OR "Health Facility Administration"[MeSH] OR "hospital management" OR "hospital governance" OR "healthcare management" OR "health services administration") AND ("Precision Medicine"[MeSH] OR "Preventive Medicine"[MeSH] OR "Patient Participation"[MeSH] OR "4P medicine" OR "P4 medicine" OR "predictive medicine" OR "personalized medicine" OR "preventive health" OR "participatory health" OR "precision health")

Results: A complete summary will be provided to demonstrate how hospitals practice management as it relates to the 4P health care principles using both narrative synthesis and meta-analysis where appropriate. A PRISMA flowchart will illustrate the process for selecting studies included in the review.

Registration: The study protocol has been registered in PROSPERO [CRD420251171543].

Key words: Hospital management, 4P healthcare, healthcare Performance, Hospital Governance, Quality of care, Patient satisfaction

RÉSUMÉ

Introduction: Les systèmes hospitaliers connaissent actuellement une profonde transformation sous l'effet des nouvelles technologies, de la numérisation, de la médecine de précision et des attentes accrues des patients. Le concept de soins de santé 4P (préventifs, prédictifs, personnalisés et participatifs) influence désormais non seulement les pratiques médicales, mais aussi les méthodes de gestion hospitalière. Cette revue systématique vise à cartographier les approches existantes et à identifier, analyser et synthétiser les pratiques, modèles et théories de gestion hospitalière alignés sur les principes des soins de santé 4P.

Méthodes: Cette revue systématique sera menée conformément aux lignes directrices PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Les bases de données à consulter comprennent PubMed, Scopus, Embase, Web of Science, Emerald Insight et Google Scholar, en combinant des mots-clés en anglais et en français autour des thèmes « santé 4P » et « Management hospitalier ». Les termes de recherche comprendront les mots-clés et termes suivants : (« santé 4P » OU « médecine P4 » OU « santé personnalisée » OU « santé prédictive » OU « santé préventive » OU « santé participative ») ET (« Management hospitalier » OU « gestion de la santé » OU « gouvernance hospitalière »).

Conclusion: Cette revue systématique vise à cartographier les approches existantes et à identifier, analyser et synthétiser les pratiques, modèles et théories du management hospitalier alignés sur les principes des soins de santé 4P.

Enregistrement: Le protocole de l'étude a été enregistré dans PROSPERO [CRD420251171543].

Mots clés: Gestion hospitalière, Soins de santé 4P, Performances, Gouvernance de l'hôpital, Qualité des soins, Satisfaction des patients

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INTRODUCTION

Hospitals are often particularly complex systems located in a dynamic environment with diverse requirements, interacting with a wide variety of actors, interests and heterogeneous factors [1]. These characteristics create a turbulent external environment, which tends to become increasingly complex and unpredictable. Traditionally, public hospitals were managed bureaucratically with a strict hierarchy, cumbersome procedures and centralized decision-making [2, 3]. However, in the face of the changes, challenges and issues facing healthcare institutions, this bureaucratic mode of organization has proved unsuitable, preventing them from adapting and adjusting quickly [4]. It therefore seems necessary to rethink hospital management, questioning traditional organizational approaches and models and focusing on management tools and models inspired by the private sector [5, 6].

Hospitals are places where three distinct approaches clash: a medical approach, an academic approach and a managerial approach focused on managerial concerns, which concentrates on generating revenue and income, while forcing hospital directors to adopt a management approach comparable to that of a company facing competition and based on a more dynamic and flexible culture, whether in terms of decision-making or innovation [7, 3].

The hospital system is going through a major transformation due to new technologies and digitalization, as well as advances in precision medicine and greater patient expectations. The concept of 4P healthcare (Preventive, Predictive, Personalized, and Participatory) now influences not only medical practices, but also hospital management methods [8]. Despite this, there is very little research available that describes how these principles apply to the managerial, organizational and decision-making strategies used by healthcare institutions [9]. This systematic review aims to identify, evaluate and synthesize existing approaches to hospital management so that they can be aligned with '4P' healthcare principles.

This systematic review addresses the following research questions: (1) What hospital management approaches are inspired by the 4P healthcare model? (2) How are the preventive, predictive, personalized and participatory dimensions reflected in hospital governance? (3) What are the impacts of these approaches on the quality of care, hospital performance and stakeholder satisfaction?

PICO Framework :

- **P** (Population): Hospital institutions and healthcare organizations
- **I** (Intervention/Exposure): Implementation of 4P healthcare principles (Preventive, Predictive, Personalized, Participatory) in hospital management
- **C** (Comparison): Traditional hospital management models (bureaucratic/hierarchical approaches)
- **O** (Outcome): Hospital performance, quality of care, stakeholder satisfaction, organizational innovation

METHODS

Study Design and Registration

This systematic review will be conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [10]. The study protocol has been registered in PROSPERO [CRD420251171543].

Information sources and search strategy

Databases to be searched include MEDLINE/PubMed, Scopus, Embase, Web of Science, Emerald Insight, and Google Scholar, combining keywords in English and French around '4P health' and 'hospital management'. Search terms will include the following keywords and terms:

("Hospitals"[MeSH] OR "Hospital Administration"[MeSH] OR "Health Facility Administration"[MeSH] OR "hospital management" OR "hospital governance" OR "healthcare management" OR "health services administration") AND ("Precision Medicine"[MeSH] OR "Preventive Medicine"[MeSH] OR "Patient Participation"[MeSH] OR "4P medicine" OR "P4 medicine" OR "predictive medicine" OR "personalized medicine" OR "preventive health" OR "participatory health" OR "precision health")

The authors of this systematic review will verify the references and agree on the articles to be included in this review. In addition, the methodological aspects of the systematic review will be specified before beginning the review.

Inclusion criteria

- Articles published between 2015 and 2025
- Written in English or French
- Study types: quantitative studies (surveys, cohort studies, cross-sectional studies), qualitative studies (interviews, case studies, ethnographies), mixed-methods studies, systematic reviews, and scoping reviews
- Study topic: studies addressing hospital management, healthcare governance, or health services administration in relation to at least one of the 4P dimensions (Preventive, Predictive, Personalized, or Participatory)
- Peer-reviewed journal articles or grey literature from official health organizations
- Empirical or theoretical studies

Exclusion criteria

- Purely clinical studies with no managerial or organizational dimension
- Articles not available in full text
- Duplicates
- Studies focusing exclusively on individual patient outcomes without organizational implications

Study Selection and Data Extraction

Search results will be imported into reference management software (e.g., Zotero or Mendeley) to remove duplicates. Two independent reviewers (A.H. and A.M.) will screen titles and abstracts. Full-text assessment of potentially eligible studies will be performed independently by the same two reviewers. Disagreements at any stage will be resolved by discussion or, if consensus cannot be reached, by consultation with a third reviewer (W.L.). Studies will be selected in three sequential steps:

- Screening of titles and abstracts against the predefined eligibility criteria;
- Full-text review of potentially eligible studies;
- Final inclusion based on predefined inclusion and exclusion criteria.

Data extraction will be performed independently by two reviewers (A.H. and A.M.) using a standardized extraction form. A fourth reviewer (S.A.) will verify data extraction for a random sample of 20% of included studies to ensure consistency. Extracted data will include:

- Study information (authors, year of publication, country, journal, study type),
- Study characteristics (sample size, methodology, conceptual or theoretical model),
- Main outcomes related to hospital management and 4P healthcare principles.

Study risk of bias or quality assessment

The methodological quality of included studies will be assessed using validated tools adapted to each study design:

- For observational studies (cross-sectional, cohort): the Newcastle-Ottawa Scale (NOS) [11].
- For qualitative studies: the Critical Appraisal Skills Programme (CASP) Qualitative Checklist [12].
- For mixed-methods studies: the Mixed Methods Appraisal Tool (MMAT) [13].
- For systematic reviews and scoping reviews: AMSTAR 2 (A Measurement Tool to Assess Systematic Reviews) [14].

Two independent reviewers will conduct a quality assessment. Any disagreements will be resolved through discussion and/or arbitration from an impartial third party.

Data analysis

For data synthesis, the meta-analysis method will be used to combine the data where studies are sufficiently homogeneous. For heterogeneous studies, a narrative synthesis will be conducted. Results will be presented using descriptive methods and visual presentations (tables, figures).

ETHICAL CONSIDERATIONS

This study does not involve the collection of primary data and therefore does not raise any ethical issues. The results will be submitted for peer review.

DISCUSSION

This systematic review aims to map existing approaches and identify, analyze and synthesize hospital management practices, models and theories aligned with the principles of 4P healthcare. The discussion will be focused on the management approaches inspired by the 4P healthcare model, examining how the preventive, predictive, personalized and participatory dimensions are reflected in hospital governance.

Also, the discussion will highlight the impacts of these approaches on the quality of care, hospital performance and stakeholder satisfaction.

Potential Impact of Results

The findings of this study could have relevant implications for both decision-makers and hospital managers. It will enable the mapping of hospital management practices aligned with 4P healthcare, shed light on the types of innovative approaches (preventive, predictive, personalized, participatory) and, above all, identify the challenges, levers and organizational impacts aimed at improving the quality of services provided and hospital performance.

Limitations

This systematic review may have certain limitations, particularly in terms of the heterogeneity of the studies included, the size of the hospitals and the results. The conceptual heterogeneity of the term '4P health' and study bias may also limit the comparability of results and impact the meta-analysis.

CONCLUSION

This systematic review will highlight the causal links between hospital management and 4P health, with the aim of promoting an integrated and competitive healthcare system. It will also shed light on advances and knowledge in this field.

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