Project Management and Quality in Healthcare: A Systematic Literature Review

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Project Management and Quality in Healthcare: A Systematic Literature Review [1]

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Abstract

The emergence of quality as a driving force in healthcare now requires innovative management techniques such as project management (PM) to attain quality management outcomes. This systematic literature review aims to determine whether the adoption of formal project management methods for managing projects among healthcare leaders improves quality management outcomes. This review involved searches of four academic databases following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. Data from 26 relevant articles were thematically analyzed by utilizing a screening process with two independent reviewers, developing a Kappa consensus matrix, and categorizing the frequency of the keyword and phrase occurrences related to the research question, namely does the use of formal project management methods for managing projects among healthcare leaders improve quality management outcomes? Seven themes emerged from the data analysis process: timely goal accomplishment (65%); cost-management through PM (58%); positive impact on quality (65%); improved task interdependence, communication, and teamwork (73%); PM as an adjunct to other quality management programs (31%); improved perceptions of PM (46%); and references to the Project Management Institute or the Project Management Body of Knowledge Guide (69%). The results demonstrate an expanding need for PM within a healthcare system and a preponderance of evidence in favor of PM as an adjunct for health leaders performing healthcare quality management. These findings suggest that healthcare professionals could consider the use of PM to improve healthcare quality management outcomes.

Keywords: project management, healthcare quality, quality management

1. Introduction

The shift from pay-for-service to performance-based healthcare delivery has involved the incorporation of a variety of quality management techniques and policies. Examples include payment reform, organizational restructuring, and evidence-based methodologies that reduce complex tasks to methodical processes.[1] The similarities between the conventional and healthcare industry are clear: reduce costs while increasing output. [2] However, healthcare organizations (HCOs) are seldom based on for-profit business structures, resulting in varying levels of expertise

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outside of the clinical environment [3]. Thus, HCOs may benefit from continuous momentum towards project management (PM) as a catalyst to improve health quality.

The Project Management Institute (PMI) is a governing body that certifies PM professionals and publishes manuals, such as the Project Management Body of Knowledge (PMBOK) Guide. Additionally, the organization operates multiple websites and journals to continuously educate and accredit PM practitioners. [13] In terms of quality, organizations such as the Institute of Medicine and the Agency for Health Research and Quality are the leading authorities. [4] The PMI is a lesser-known entity in the health business, but it has established information technology and business methods that enable teams to complete short-to-medium length projects. [5] The two management domains rarely intersect in the healthcare industry.

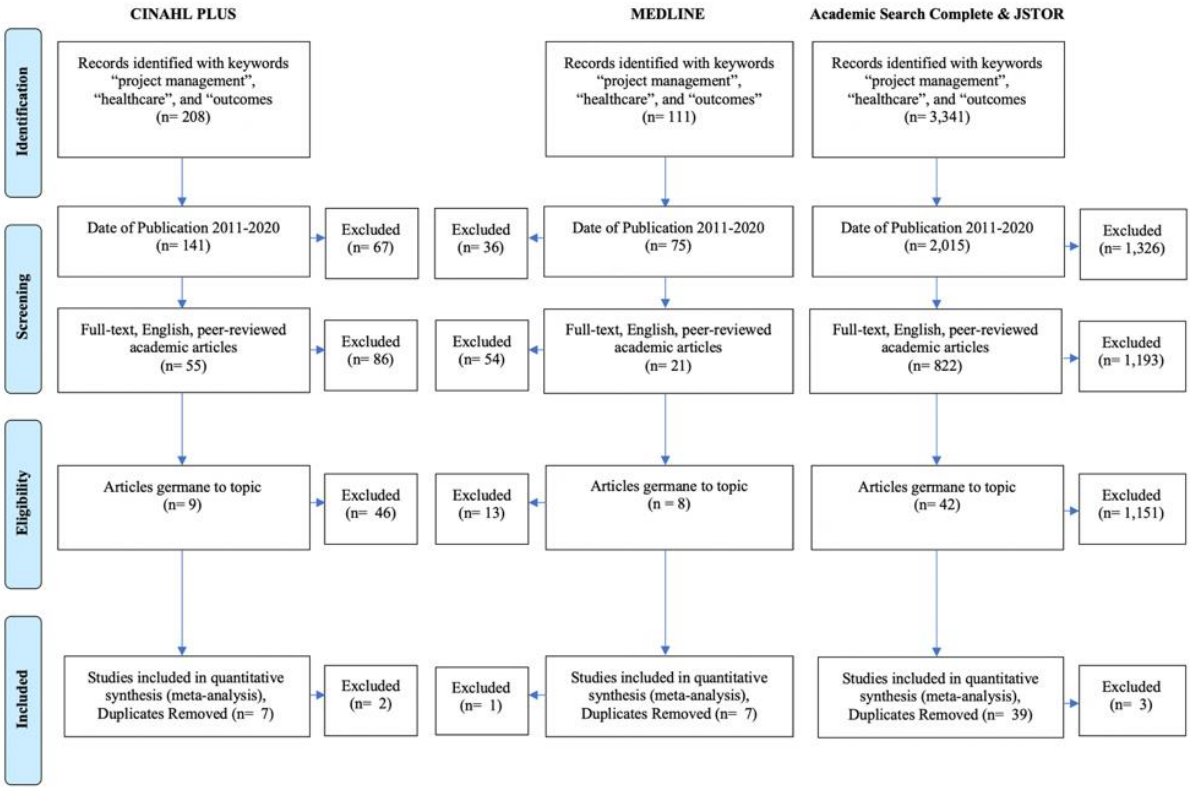
Organizations with recurring projects and development utilize project management offices (PMOs) to oversee individual teams and project life cycles. [6] Like patient-centered medical homes, project managers and stakeholders' coordinated efforts incorporate strategic planning and ongoing analysis. [7] The structure of a health care organization requires a mixed approach for integrating the evidence and strategies to improve organizations [8]; PM is one such method. It is unrigid in its application and incorporates best practices such as Lean and Six Sigma and advanced approaches to accomplishing goals. [9]

The experience level of health leaders may vary, and integrating structured PM requires an assessment of managerial competencies. No central authority identified or compiles comprehensive strategies for PM implementation specific to healthcare, but the literature indicates positive impressions on the part of practitioners. Thus, an exhaustive search of the academic literature in the field of quality management methodologies utilized by health workers is warranted. The methods and findings of this study are intended to elucidate opportunities for the PM and healthcare industries alike. The value of PM should align with health quality in terms of efficiency and organizational success. Ultimately, the purpose of this systematic literature review is to determine whether the use of PM methods for managing projects among healthcare leaders improves quality management outcomes.

2. Methods

An initial assessment of the volume of academic literature about project management in healthcare and among healthcare practitioners was conducted via Google Scholar guided by the following research question: does the use of formal PM methods for managing projects among healthcare leaders improve quality management outcomes? The research then shifted to CINAHL Plus and MEDLINE via EBSCOhost. It is important to note that Google Scholar was used solely to form an impression of preexisting work before continuing the research through academic databases following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis standards [10]. The screening criteria included a (a) search for relevant studies, (b) analysis to recognize themes, (c) adherence to the exclusion and screening criteria listed in Figure 1, and (d) analysis and reporting of findings. [10] The keywords utilized were based on the research question including "project management," "healthcare," and "outcomes."

Due to the contemporary nature of the issue investigated in this study, the omission of articles before 2011 transpired. All articles (a) were written in English, (b) were peer-reviewed and published in journals, (c) included the full text, and (d) concerned with the role of project management in healthcare and quality management outcomes. With filters based on the keywords, CINAHL Plus provided 55 articles, nine of which were germane to the research question. Meanwhile, MEDLINE provided 21 articles with filters based on the keywords and eight relevant articles. Any articles that did not meet the inclusion criteria were omitted from this review.



Due to an underlying lack of PM-related research articles available through CINAHL Plus and MEDLINE, the research included three additional databases relevant to the exclusion criteria. First, EBSCOhost was queried via Academic Search Complete with CINAHL and MEDLINE excluded to remove duplicates. Searches of Academic Search Complete and JSTOR using filters yielded 822 articles utilizing filters, of which 42 were found to be relevant after reviewing each page of the articles. In all, 39 articles remained after removing duplicates, assessing the relevance to the subject matter, and removing conference proceedings and other articles that met the exclusion criteria (see Figure 1).

		Reviewer 2		
		Yes	No	Total/%
Reviewer 1	Yes	26	1	27
	No	1	25	26
	Total/%	27 (51%)	26 (49%)	53 (100%)

Fig. 2. ***Cohen Kappa Matrix***

When calculating the Kappa coefficient, the authors started with 53 articles identified and reviewed by two independent reviews. Of the 53 articles, 26 were clearly relevant to the research question of whether project management improves healthcare quality management outcomes. Each reviewer found one article that was not relevant to the research. The Kappa coefficient transpired using the coefficient guidelines of (a) 0 = none, (b) 0.01–.02 slight, (c) 0.21–.40 fair, (d) 0.41–0.60 moderate, (e) 0.60–0.80 substantial, and (f) 0.80–1 almost perfect [11]. The final Kappa analysis results for this review displayed an unweighted Kappa calculated at 0.9245 (see Figure 2). The articles evaluated demonstrated an almost perfect level of agreement that is beyond chance alone, indicating a statistical significance in the literature included.

3. Results

The primary research question was as follows: does the use of formal PM methods for managing projects among healthcare leaders improve quality management outcomes? A search and review of the literature was conducted utilizing four scholarly databases – CINAHL Plus, MEDLINE, Academic Search Complete, and JSTOR. A search of the identified literature, selection, and data analysis process followed [10]. Based on the data from 51 articles germane to the research question, 26 were found to be relevant according to the Kappa Cohen calculation. The final decisions concerning the inclusion of articles were made by comparing the finalized findings presented in each article (see Figure 1). *Table 1* lists the title of the articles and key summary findings from the 26 articles.

Data mining of the literature led to the identification of keywords pertinent to the research question and affinity matrix. A tag cloud of the research articles was created to highlight rudimentary patterns and emphasize 14 qualitative words [12]. The keywords excluded any redundant verbiage from the research question, such as "project," "management," or "healthcare." Additionally, plural modifiers were applied, and duplicated were removed. The data mining of the research indicated a high rate of the words quality, change, risk, knowledge, integration, time, cost, success, performance, outcomes, deliver, communication, collaboration, and interdependence. Figure 3 provides a visual representation of semantics weighted by the frequency of use.

Word	Instances
Quality	645
Change	610
Risk	555
Knowledge	271
Integration	310
Time	401
Cost	394
Success	245
Performance	226
Outcomes	280
Deliver	208
Communication	133
Collaboration	130
Interdependence	127

Fig. 3. *Tag cloud representation of 26 evaluated articles*

An established affinity matrix displayed recurring themes within the research related to PM in healthcare management. Seven themes emerge across the gamut of articles: (a) PM contributes to timely organizational goal accomplishment; (b) cost-containment or cost-management improvement through PM; (c) positive impact on quality; (d) improved task interdependence, communication, and teamwork; (e) PM as an adjunct to continuous quality management, total quality management, or change management; (f) improved respondent perceptions of PM in healthcare; and (g) references to the PMI or the PMBOK Guide indicating a formalized knowledge domain (see the matrix in *Table 2*). There were 106 total mentions of PM in healthcare, including references to the PMI, indicating that a formalized knowledge domain exists among researchers.

From the research, a total of 17 of the 26 (65%) articles reported that PM contributes to timely organizational goal accomplishment. [7, 9, 14, 16, 19, 20, 21, 23, 24, 25, 27, 28, 30, 32, 33, 34] In addition, 15 (58%) reported cost-containment or cost-management improvement through PM. [9, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 28, 32, 34, 35] Of the 26, 17 (65%) reported a positive impact on quality. [7, 9, 14, 15, 17, 18, 19, 21, 20, 23, 24, 29, 31, 27, 28, 32, 35] Next, 19 (73%) reported improved task interdependence, communication, and teamwork. [6, 9, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 27, 28, 29, 30, 32, 33] Eight (31%) mentioned PM as an adjunct to continuous quality management, total quality management, or change management [6, 9, 18, 23, 25, 26, 32, 35], and 12 of 26 (46%) reported improved respondent perceptions of PM in healthcare. [7, 9, 21, 23, 24, 26, 27, 29, 30, 31, 33, 35] Finally, 18 of the 26 articles (69%) referenced or mentioned PMI or the PMBOK Guide, suggesting formalized knowledge. [7, 6, 9, 14, 16, 17, 19, 20, 21, 23, 24, 26, 27, 36, 30, 32, 33, 34]

4. Discussion

This systematic literature review aims to determine whether the use of PM methods for managing projects among healthcare leaders improves quality management outcomes. Seven themes emerged across the articles reviewed: (a) PM contributes to timely organizational goal accomplishment; (b) cost-containment or cost-management improvement through PM; (c) positive impact on quality; (d) improved task interdependence, communication, and teamwork; (e) PM as an adjunct to continuous quality management, total quality management, or change management; (f) improved respondent perceptions of PM in healthcare; and (g) references to the PMI or the PMBOK Guide, indicating a formalized knowledge domain.

The texts revealed varying levels of formal and informal PM healthcare applications in the last decade. The effectiveness of projects is defined by time, cost, scope, quality, and success. [13] A change in one measure then constrains other measures. [14] As a result, PM may contribute to quality management initiatives leading to the implementation of evidence-based decision-making that incorporates off-the-shelf strategies. [15] Notably, PM was associated with improved communication and task interdependence in PM trials in healthcare organizations. [16, 17] Key findings throughout the literature supported expanding PM within the context of a hybrid design for healthcare [18], [7]. Accordingly, the measure of success in PM is quantifiable by clinical and organizational outcomes [19].

Foremost, PM contributes to timely organizational goal accomplishment and contributes to aligning work with timelines, as evident in 17 of 26 (65%) articles. [7, 9, 14, 16, 19, 20, 21, 23, 24, 25, 27, 28, 30, 32, 33, 34] Predetermined project schedules formed in the planning phase of PM benefit PLs and team members. [20, 21, 22] Health workers in PM trials noted the importance of assigning roles and schedules to work processes. As a result, participants reported the plan and schedule as a direct input for completing tasks on time and determining stakeholder costs in the full scope of projects [23, 24]. Value is generated from time, either expended or saved and is ultimately returned to the organization financially [13]. In turn, attaining value compounds the costs and benefits associated with quality management methods.

Cost containment is a crucial component of value-based care in the post-Affordable Care Act era, and 58% of articles reported cost-related benefits from PM risk-evaluation strategies. [9, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 28, 32, 34, 35] Allen, Carpenter, Hutchins, and Jones analyzed multiple industries and found that the risk management facet of PM lacks maturity in HCOs. [25] In some cases, the rising cost of healthcare was a detriment to taxpayers and the industry at large. [26, 27, 28] As a cost-containment strategy, reimbursement and healthcare solvency are seldom tied to PM. However, project budgets control organizational endeavors and allow oversight over the costs of initiating a project. [6, 28] From the standpoint of patients as projects, reducing unnecessary care is an essential consideration for determining the cost to payers [20]. In terms of PM research, the concern of cost is tertiary to health quality, which contrasts with the industry's shift to quality-based reimbursement [4]. Thus, cost and risk assessments further benefit quality management strategies through methodological PM strategies.

This review found that healthcare PM initiatives had a positive impact on quality in 17 of 26 (65%) articles. [7, 9, 14, 15, 17, 18, 19, 21, 20, 23, 24, 29, 31, 27, 28, 32, 35] Project management has adopted and synergized strategies such as Lean and Six Sigma under one umbrella to enable project managers to manage teams effectively. [13] Moreover, HCOs adapt to frequent changes and forecast demand like non-medical industries. Agile is a method for managing changing landscapes and horizontal organizations that require flexibility during uncertainty. [9] Procedurally, PM may enable transparency between stakeholders and team leaders through effective communication and organization. [21, 29] The perceptions of patients remain difficult to gauge due to limited interactions with project stakeholders. However, the coordination of care in the age of multi-morbidity requires comprehensive case management of interdependent patient needs. [30, 20, 31] Thus, PM has a relationship with cooperation and task interdependence in healthcare teams.

In addition, PM was associated with improved task interdependence, communication, and teamwork in 19 of 26 (73%) articles. [6, 9, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 27, 28, 29, 30, 32, 33, 34] Scrum and Agile facilitate communication akin to Kaizen's work with stakeholder contributions. [9] Adapting to health reform requires an integrated approach, and PM may improve transformations and change management. [32]

Consequently, quality improvement initiatives and hospital accreditation may benefit from life cycle PM to achieve continuous returns on investment based on 8 out of 36 articles (31%). [6, 9, 18, 23, 25, 26, 32, 35] Hakim succinctly summarized the concepts of PMI and Lean as stepping stones to continuous quality improvement. [18] As a result, the preponderance of research indicates improved participant perceptions of management through PM. [34] In turn, individual experiences for new PM teams varied based on the experience level of the PLs and organizational structure.

Authors and trial participants reported positive perceptions of PM within the healthcare setting in 12 of 26 (46%) of articles. [7, 9, 21, 23, 24, 26, 27, 29, 30, 31, 33, 35] Although the authors intended to highlight the role of PM practice in healthcare, all leaders must possess change management skills to increase buy-in during projects. In one example, respondents derided the implementation of time constraints in an industry that promotes professional autonomy. As a result, organizations with a low level of communication can benefit from improved stakeholder management to improve buy-in and feedback [23], [27].

Moreover, only 18 of the 26 (69%) articles reference PMI or the PMBOK Guide, which indicates the existence of a formalized PM knowledge domain. [7, 6, 9, 14, 16, 17, 19, 20, 21, 23, 24, 26, 27, 36, 30, 32, 33, 34] The sparsity of formal PM given the exclusion criteria may suggest that rigid PM is poorly suited for addressing unique healthcare projects (Pool et al., 2019). Thus, the hybrid model is a potential solution to implementing PM within healthcare quality management while sustaining professional autonomy. [35, 16, 36, 17]

Figure 2. Summarized findings of the literature

Title	Findings
Exploring PMOs through community of practice theory [6]	The article underlines the importance of PMOs in the increasingly competitive healthcare industry.
The best of both models. Key components of a successful hybrid project management office model in a health care organization [7]	This study of PMOs addressed outcomes during migration to a PM-based structure in a health network. Knowledge of PM improved quality, organizational learning, organizational planning, and staffing.
Agile' helping Mayo improve its projects [9]	The authors highlight the benefits of PM, agile, and Six Sigma in the healthcare industry. Compared to waterfall management, agile contributed to sustainable performance benefits.
Project management supports the change process [14]	This article outlines the value of PM phases within the healthcare setting and the impact on organizational goals. Notably, the authors assert that PM is associated with knowledge management and educational improvement within the nursing education setting.
Project Management success in health – the need of additional research in public health projects [15]	The authors assert the value of PM in attaining quality outcomes through defined health promotion goals. Public health initiatives are broad in scope, and PM supplements targeted policies and health programs.
Informational role self-efficacy: A validation in interprofessional collaboration contexts involving healthcare service and project teams [16]	The authors assess barriers to information sharing and horizontal integration within healthcare. The authors evaluate the impact of autonomy on collaboration and efficient communication within healthcare.
Facilitating translational team science: The project leader model [17]	The study outlines the capabilities, capacity, and competencies of effective project leaders (PLs) in healthcare projects. Here, 57% of PLs possessed formal PM training, and 18% possessed a certification. Additionally, the authors assert that translational team science obstacles may be solved with effective PLs.
Hybrid project management has role in health care today [18]	This addendum to [25] asserts that Agile's is similar to total quality management and continuous quality improvement. Notably, the author states that a lack of PM research in healthcare has slowed implementation.
Project management lessons learned from the multicentre CYCLE pilot randomized controlled trial [19]	The article outlines PM's use in randomized controlled trials in the intensive care environment. Project management contributed to improved clinical outcomes through comprehensive phased design. Additionally, lessons learned within each phase facilitated further improvement.
Care for a Patient with Cancer as a Project: Management of Complex Task Interdependence in Cancer Care Delivery [20]	The authors apply PM principles to oncology patients and design treatment plans to coordinate care. The visual representation of project schedules was melded with the clinical facets of cancer treatment and facilitated task interdependence. Additionally, PM improved quality metrics and enabled payer contracts. The article identifies the patient as a project stakeholder.
Speeding Time to Market with Better Pharmaceutical Project Management [21]	The article utilizes PM as a method to formalize drug development and effectively market medications. The author outlines stakeholders and the benefits of PM to organizational goals and performance.
Application of project management tools and techniques to support nursing intervention research [22]	The authors outline the tangible and intangible benefits of PM within the nursing field. Phased implementation of PM improved research capabilities through brainstorming, evaluation, and other PMBOK principles.

Table Continues

Researchers' experience with project management in health and medical research: Results from a post-project review [23]	A methodological evaluation of the perceptions of research teams performing within a structured PM life cycle. Participants perceived positive results and perceptions regarding the use of PM.
An exploratory study of the value of project management for hospital administration in Thailand [24]	A study of PM skills among physicians working in administrative positions. The study suggests that medical treatment and management follow the steps of a project and imply the systematic benefits of PM adoption.
Impact of risk management on project cost: An industry comparison [25]	The study compares project risk management (RM) between the healthcare sector, military industry, construction, and NASA. Each industry utilizes RM as either a cost input, cost output, or decision-making tool. Notably, healthcare considered to be project-based, with a need to expand RM. The key finding is an underlying lack of PM and RM in an industry that accounts for growing costs.
Science or art: risk and project management in healthcare [26]	This study also provides support to the benefit of risk management as a cost-containment methodology within healthcare. Interdependent processes and knowledge management are critical assets for risk mitigation and project management.
Project stakeholder management in the clinical research environment: How to do it right [27]	This article suggests the PMBOK Guide's tenets serve as a cornerstone of public health research and improvement in the hospital setting. The value of stakeholder engagement and management is tied to organizational success.
Project management: importance for diagnostic laboratories [28]	The study evaluated the benefits of PM in laboratories and reported improvements in quality, cost, and time limits.
Team integration and owner satisfaction: Comparing integrated project delivery with construction management at risk in health care projects [29]	A civil engineering evaluation of PM that explores the inputs and variables in healthcare construction projects. Owner perceptions of cost, timeliness, safety, quality, and business objectives were found to be correlated with positive team performance. Notably, the complexity of designing healthcare facilities is more complicated than the design in other industries. Additionally, the authors assert the importance of PM in healthcare delivery.
Multi-level efficacy evidence of a combined interprofessional collaboration and project management training program for healthcare project teams. [30]	The article asserts that the frequency of projects in healthcare and the trials of project work indicate improved PM training among health workers. The researchers found that access to participants in trials is limited due to privacy requirements and attrition. The article suggests a reduced emphasis on administrative and business training among health workers.
Do project management and network governance contribute to inter-organisational collaboration in primary care? A mixed methods study [31]	The researchers implemented PM in primary care to improve employee performance and satisfaction. Notably, participant satisfaction improved, but the authors struggled to gauge patient satisfaction. However, the transitive benefits of improved performance and inter-organizational improvement are noted.
Managing healthcare integration: Adapting project management to the needs of organizational change [32]	The authors utilized PM through a hybrid model that acknowledged the benefits of change management and life cycles. Restructuring in response to economic variables, cost-containment, and health reform required improvisation due to a lack of PM guidance concerning healthcare.
Project management for hospital accreditation: a case study [33]	The authors utilized PM to facilitate hospital accreditation with positive perceptions from all stakeholders.
A study of project management knowledge and sustainable outcomes in Thailand's reproductive health projects [34]	This article describes health projects guided by the PMBOK guide and outcomes. The benefits were palpable in entities that utilized PM while suggesting improving knowledge domains.

Table Continues

Towards a theory of quality management: An integration of strategic management, quality management and project management [35]	The article discusses the adoption of total quality management alongside project management. The alignment of long- and short-term quality management requires attention to be paid to project management, quality management, and strategic management domains. The hybrid model is named strategic collaborative quality management.
A discursive sensemaking perspective on project-based work in public healthcare [36]	The study evaluates the preexisting perceptions of public health professionals, biases, decision-making, and PM's value in healthcare. Categorical attitudes, strategies, and the effects of PM team members in public health revealed a mixed view. Notably, respondents stated that PM requires resilience and time management.

5. Limitations and Minimizing the Limitations

Limitations may include (a) practical time constraints, (b) the exclusion of non-English language articles, (c) the search strategies used, and (d) the subjectivity of the reviewers. The data collection process transpired over five weeks. Due to the time constraints, the researchers used four major databases, and there may have been bias in the article selection process. Using four databases resulted in the exclusion of other databases and resources, which may have had additional qualifying articles to add to the findings.

The authors minimized the impact listed above by following the PRISMA-based systematic review guidelines and protocol. The authors triangulated and filtered the information collected, starting at 208 articles from CINAHL Plus, 111 articles from MEDLINE, and 3,341 articles from Academic Search Complete and JSTOR, until data saturation level occurred with no additional information for developing themes. The authors reviewed each article and ensured the research conducted for this study aligned with the research question to minimize the impact thereof. Despite the limitations of this study, its findings shed some light on whether the use of PM methods for managing projects among healthcare leaders improves quality management outcomes.

6. Future Research

Existing research on PM excluded patient satisfaction and performance metrics in any meaningful context. Patient experiences are limited to interactions with providers and health staff. As a result, procedural management became the focal point of the author's research. Future research would benefit from the integration of patient satisfaction surveys and qualitative measurement of organizational success. Additionally, the present study focused on scholarly research in the form of published work. Future analyses may consider health data from government sources such as the US Department of Health and Human Services. For example, an evaluation of PM in managed care organizations, as opposed to fee-for-service organizations, may have implications for application within healthcare quality management. Finally, the shift to value-based care and affordable care organizations is likely to reveal distinguishing aspects of transformational HCOs that adopt evidence-based approaches to quality management, such as PM.

7. Conclusion

The purpose of this systematic literature review was to determine whether the use of PM methods for managing projects among healthcare leaders improves quality management outcomes. The results indicated the existence of seven themes for improving healthcare quality through PM. The primary themes identified are the benefits of timely organizational goal accomplishment, cost-containment, and quality improvement. Other themes included improved team cohesion, the hybrid PM methodology, improved perceptions of respondents, and references to PMI or the PMBOK Guide. The review found a preponderance of evidence in favor of PM as an adjunct for health leaders performing healthcare quality management. Additionally, there is a need for future research on the topic of multiple healthcare delivery systems. Healthcare leaders and project stakeholders should continue to explore innovative management strategies to improve the quality and outcomes of clinical outcomes.

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