

8-2022

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Recommended Citation

Vetter, Garrett L., "The Patient-Centered Medical Home and the Value of Heightened Care Coordination: A Systematic Literature Review" (2022). *Capstone Experience*. 213.
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The Patient-Centered Medical Home and the Value of Heightened Care Coordination:

A Systematic Literature Review

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Abstract

Health care spending in the United States continues to increase at a pace that far exceeds inflation. Representing a greater proportion of the nation's gross domestic product (GDP) than any other country, costs associated with health care services in the U.S. lend support to growing concern regarding the sustainability of current systems. Furthermore, the fragmented nature of the current landscape often presents challenges to the provision of high-quality and efficient care. Satisfaction among both patients and health care providers, alike, suffers under the weight of increasing regulatory burden, the lack of integrated medical records systems, and growing complexity among health insurance payer programs. The patient-centered medical home (PCMH) model proposes a variety of strategies to improve coordination among health care services, reduce utilization of higher acuity services, and promote increased satisfaction for patients within the continuum of care. This Systematic Literature Review (SLR) seeks to highlight the strategies proposed within the PCMH model and provide an analysis of available data surrounding these claims of improved outcomes and reduced costs.

Chapter 1 – Introduction

This Systematic Literature Review (SLR) was performed to explore the body of research and information available surrounding the viability of the Patient-Centered Medical Home (PCMH) model of primary care delivery as it pertains to its potential to improve health outcomes, reduce health care spending, and promote increased coordination among health care service providers. Presently, health care costs in the United States continue to soar in part due to fragmented systems and wasteful spending. In 2020, U.S. health care spending reached \$4.1 trillion and accounted for 19.7 percent of the nation's gross domestic product (GDP). (Centers

for Medicare & Medicaid Services, 2021) In recent history, a variety of models and strategies for foundational change to help alleviate this costly burden have been conceived with mixed results. In many of these strategies, targeting the systems most frequent users are common themes. While there are numerous conditions and factors which contribute to utilization of systems of care, it has been found that chronic condition management plays a major role. Aging adults with multiple chronic conditions are a significant factor for growing health care spending. This is further illustrated by examining costs of the Medicare program. Medicare beneficiaries exhibiting five or more chronic conditions have contributed to approximately two-thirds of all Medicare spending in previous years. (Bould, et al. 2009) This paints the picture of a health care system that is ill-adapted to manage a growing population of aging adults and facilitate cost-effective care management on a large scale.

Research Questions

The growing economic burden of health care costs is a problem that spans a variety of arenas with vast potential consequences. In the absence of innovative and effective methodologies for care delivery, this problem has the potential to remain unchecked and impact large systems and individual patients, alike. In addition to addressing some of these contributing factors, the PCMH model was developed to improve care coordination among service providers, enhance health outcomes for patients, reduce utilization of high-acuity services, and improve patient and provider satisfaction. This review has been performed in consideration of these factors and seeks to further understand these potential impacts. Specifically, questions to be addressed include the following:

- *Is the PCMH model associated with a reduction in utilization of emergency room or inpatient hospital services?*
- *Is there a financial benefit for individual health care organizations/practices to implement the PCMH model?*
- *What factors exist as barriers to the success or implementation of the PCMH model?*

Furthermore, this SLR also considered exploring factors related to population health, health promotion, program planning/evaluation, and fiscal management of health care service providers in tandem with these specific questions.

Objectives

This SLR seeks to compile and create a detailed and comprehensive review of available literature to explore the value of the PCMH as a foundational component of care delivery. Additionally, the objective of this review is to explore facets of the PCMH model in reference to the aforementioned research questions.

This SLR also seeks contribute to the overall body of knowledge surrounding the PCMH concept in the context of these research questions and to do so in a detailed and explicit manner to promote transparency.

Rationale for Review

Among growing concerns of an aging adult population in the United States and the costly trajectory of health care spending many proposed reform programs have shifted in and out consideration in recent years. The PCMH model is one such example of a proposed methodology

with aims to improve care coordination, promote better access to care, and reduce the health care spending (Flieger, et al., 2017; Fu, et al., 2022; Green, et al., 2017; Rosenthal, et al., 2015)

Targeted aims of the intervention seek to reduce inpatient and emergency department utilization and promote better management of certain conditions through a systems-approach (Dorr, et al., 2015; Rosenthal, et al., 2016)

This SLR utilized detailed search methodology to explore a multitude of study designs from different sources using detailed strategies and evaluation methods to gather a broad cross-section of available data on the PCMH model and its impacts in a variety of arenas. In exploring the available body of knowledge and synthesizing this data, this analysis allows for additional insight into the effectiveness of PCMH interventions as it pertains to reducing high-cost health care service utilization, financial implications of implementation of the intervention, as well as considerations for transformation including barriers or factors that have the potential to impact its viability or sustainability. The intent of this SLR is to provide a clear summary of available information on this topic to be of use in consideration of the PCMH intervention and what it aims to achieve.

Chapter 2 – Background

The foundation of the provision of health care and the central hub around which other avenues of specialty care extend from can be seen in examining the work of primary care providers. A system of primary care delivery is the first contact for most patients and serves to manage the health and well-being of a patient population with a focus on prevention and reduction of utilization of hospitals and acute care services. (Agarwal, et al., 2017) While there is a demonstrated relationship between access to primary care and improved health outcomes this

dynamic changes as it relates to specialty care and other services. In certain areas of the country with high concentrations of primary care providers, many events attributable to 30-day readmissions to hospital settings such as acute myocardial infarction, pneumonia, and heart failure were significantly reduced. (Chetty, et al., 2010) However, in areas with comparable primary care availability but higher concentrations of specialty care services this reduced utilization is not as prevalent. In fact, generally increased concentrations of physicians across all major specialties have been found to be associated with an increased risk of readmission for these same conditions. (Chang, et al., 2011) This, among other factors, aids to demonstrate the dynamic relationship between multispecialty care and further underscores the importance of care coordination and the interoperability between services a patient may receive. The intent of reform programs and models such as the patient-centered medical home model seeks to balance access and consistently delivered care with heightened coordination among other service organizations and specialties outside of the medical home.

In addition to its relationship to adverse outcomes and ER/hospital utilization, the same disparate systems and issues with fragmented care present financial challenges for individual providers and the larger health care system. The United States health care system as a whole is perhaps the most expensive system in the world. Of the almost 20% of the U.S. gross domestic product (GDP) that is attributable to health care spending, there is broad consensus among experts that a significant portion can be defined as waste. (Centers for Medicare & Medicaid Services, 2021) In 2012, it was estimated that at a minimum, 20% of total health-related expenditures can be classified as wasteful. (Berwick, D.M. & Hackbarth, A.D., 2012) This wasteful spending can be classified further among such categories as overtreatment, failures in

the execution of care processes, redundancies in administrative processes, regulatory and administrative complexities, and lack of coordinated care.

Beyond what is considered waste, there are expenditures in health care delivery that are not redundant or unnecessary. Conditions such as diabetes, heart disease, various cancers, and other vascular diseases represent a significant proportion of what is managed by primary care providers in tandem with other specialists. The conditions correspond with significant costs to manage and treat. These chronic, non-communicable diseases pose significant costs both in terms of quality of life and health outcomes as well as financial expenditures. Studies exploring the cost of these disorders have found some conditions, such as cardiovascular disease, can represent upwards of 16% of health care costs in a given year. (Muka, T. et al., 2015)

Furthermore, studies show that the prevalence of multiple chronic conditions is increasing among individuals of all ages – resulting in poorer outcomes, elevated costs, and additional strain on health care systems. (Sambarmoorthi, U., et al., 2015) It should be noted that while there is significant data to support the amount of financial burden experienced in treating these conditions, these figures are estimated. Such estimates are often difficult to fully depict the impact across such a wide range of patient populations and geographic areas. However, it is clear that the complexity of these conditions compounded with the complexity of the health care landscape make this a great challenge.

With all of these factors at play, it is becoming increasingly difficult to coordinate the care required for these populations as much as it is becoming increasingly important to do so. The PCMH model presents a foundation for improving these processes associated with team-based care, care that is coordinated with other components of the health care system, improving access to care, and a systems approach to care delivery. (Jackson, G., et al. 2013) This SLR

hopes to explore current data on this system and its promise of improved primary care to evaluate its potential impact on these factors and explore potential financial implications for providers and the broader health care system.

Chapter 3 – Methods

Identified source material will be gathered with the aim of reviewing the current body of PCMH knowledge and research to analyze and provide insight to health service providers evaluating this model for implementation. Research studies on this topic are desired to explore correlations between implementation of the PCMH model and subsequent impacts to utilization of higher acuity services and related health care costs. Additionally, studies from a wide array of practice and population types have value in exploring barriers and variances in these same outcomes.

Search Strategy

This Systematic Literature Review utilized multiple literature databases and tailored search strategies to gather relevant sources for review. Searches were conducted using EMBASE and PubMed databases. Searches within each database used search strings generated using Emtree and MEDLINE indexed terms and keywords, respectively. Each search string included the following topics: patient-centered medical home, utilization management, health care cost, public health components, and location. The entire search string used for each database are included in Table 1 and Table 2.

Table 1: EMBASE Search Thread

Topic	Concepts	Search Strings	Results
Patient-Centered Medical Home	Patient-Centered Medical Home OR Medical Home OR Patient-Centered Medical Home Certification	('patient centered medical home')/br OR (('medical home')/exp/mj) OR (('patient centered medical home certification')/exp/mj)	2,251
Utilization Management	Health Care Utilization OR Hospital Admission OR Emergency Services OR Emergency Department Visit OR Inpatient Care	'hospital admission'/exp OR 'health care utilization'/exp OR 'emergency department visit'/exp OR 'hospital visit'/exp OR 'hospital emergency service'/exp OR 'emergency ward'/exp OR 'inpatient care'/exp OR 'utilization management'/exp	485,665
Patient-Centered Medical Home AND Utilization Management			292
Health Care Cost	Health Care Cost OR Financial Management OR Cost of Care OR Return on Investment	'health care cost'/exp OR 'financial management'/exp OR 'hospitalization cost'/exp OR 'hospital finance'/exp OR 'return on investment'/exp OR 'cost of illness'/exp	770,512
Patient-Centered Medical Home AND Utilization Management AND Health Care Cost			120

Public Health Concepts	Primary Care Services OR Care Coordination OR Health Promotion OR Preventive Care OR Population Health OR Epidemiology OR Public Health	'primary medical care'/exp OR 'primary health care'/exp OR 'care coordination'/exp OR 'health promotion'/exp OR 'preventive care'/exp OR 'prevention'/exp OR 'population health'/exp OR 'population health management'/exp OR 'epidemiological data'/exp OR 'epidemiology'/exp OR 'public health'/exp	6,554,128
Patient-Centered Medical Home AND Utilization Management AND Health Care Cost AND Public Health Concepts			
Location	United States	'United States'/exp	1,382,464
Patient-Centered Medical Home AND Utilization Management AND Health Care Cost AND Public Health Concepts AND Location			81

Table 2: PubMed Search Thread

Topic	Concepts	Search Strings	Results
Patient-Centered Medical Home	Patient Centered Medical Home OR Medical Home	((("patient centered medical home"[All Fields]) OR ("pcmh"[All Fields])) OR ("medical	40,908

		home"[All Fields])) OR (Patient-Centered)	
Utilization Management	Health Care Utilization OR Hospital Admission OR Emergency Services OR Emergency Department Visit OR Inpatient Care	(((((("utilization"[All Fields]) OR ("inpatient encounters"[All Fields])) OR ("hospitalization"[All Fields])) OR ("emergency room er visits"[All Fields])) OR ("emergency room admissions"[All Fields])) OR ("er admissions"[All Fields])) OR ("emergency department visit"[All Fields])) OR ("emergency department encounters"[All Fields])) OR ("emergency department use"[All Fields])) OR ("hospital utilization"[All Fields]))	521,937
Patient-Centered Medical Home AND Utilization Management			2,565
Health Care Cost	Health Care Costs OR Health Care Spending OR Financial Management	(((((("cost"[All Fields]) OR ("cost of care"[All Fields])) OR ("spending"[All Fields])) OR ("spend"[All Fields])) OR ("cost of health care"[All Fields])) OR ("health care costs"[All Fields])) OR ("financial management"[All Fields]))	655,312
Patient-Centered Medical Home AND Utilization			519

Management AND Health Care Cost			
Public Health Concepts	Primary Care Services OR Care Coordination OR Health Promotion OR Preventive Care OR Population Health OR Epidemiology OR Public Health	(((((("primary care"[All Fields]) OR ("primary health care"[All Fields])) OR ("primary care provider"[All Fields])) OR ("primary care services"[All Fields])) OR ("care coordination"[All Fields])) OR ("health promotion"[All Fields])) OR ("preventive care"[All Fields])) OR ("population health"[All Fields])) OR ("population health management"[All Fields])) OR ("epidemiology"[All Fields])) OR ("public health"[All Fields])) OR ("intervention"[All Fields])) OR ("program planning"[All Fields]))	3,921,186
Patient-Centered Medical Home AND Utilization Management AND Health Care Cost AND Public Health Concepts			341
Location	United States	"United States"	4,261,792
Patient-Centered Medical Home AND Utilization Management AND Health Care Cost AND Public Health Concepts AND Location			177

Inclusion and Exclusion Criteria

Literature identified via the established search strings was then exported and imported into EndNote, a citation management software tool. Within EndNote, a search for duplicate citations was performed and duplicate sources were eliminated. Then, the list of citations was exported from EndNote and uploaded into Covidence. Covidence was used to organize citations and conduct an initial screening of titles and abstracts for relevancy to the topic of the SLR. Specific criteria for inclusion and exclusion were created and applied to each title/abstract during the relevancy screening process. Inclusion and exclusion criteria are included in Table 3.

Table 3: Inclusion and Exclusion Criteria

	Inclusion Criteria	Exclusion Criteria
Topic	<ul style="list-style-type: none"> • PCMH planning, implementation, or evaluation • Interoperability between facilities, specialties, or providers within the PCMH model • Population health managed by a PCMH • Patient continuity of care within the PCMH • PCMH standards and outcomes 	<ul style="list-style-type: none"> • Absence of and no association with PCMH model
Demographics	<ul style="list-style-type: none"> • Primary care or specialty care practice setting • Inpatient/acute care setting with outpatient service lines/partnerships 	<ul style="list-style-type: none"> • Strictly inpatient setting with no outpatient service line interaction

Outcomes	<ul style="list-style-type: none"> • Financial inputs and outputs related to PCMH model • Factors related to planning, implementation, or maintenance of the PCMH model • Population health data within the PCMH • Implementation or review of care coordination processes, interventions, or outcomes as it relates to PCMH 	<ul style="list-style-type: none"> • Lack of relevance0
Other Criteria	<ul style="list-style-type: none"> • Located in the United States • English Language 	<ul style="list-style-type: none"> • Located outside of the United States • Non-English Language

Data Extraction

Within Covidence, study titles and abstracts were reviewed and the relevancy screening process was performed. Documentation of specific inclusion/exclusion criteria applied for each study was recorded in addition to study design type for each included source. Included citations were then reviewed via full text review and analysis as well as review of study quality/critical appraisal.

Quality Assessment

Review of study design and quality was performed for all included citations. The Johanna Briggs Institute of Critical Appraisal and the Mixed Methods Appraisal Tool were utilized for assessing the quality of each source. The following resources were employed during this process:

The Johanna Briggs Institute Critical Appraisal Checklist for Qualitative Research, The Johanna

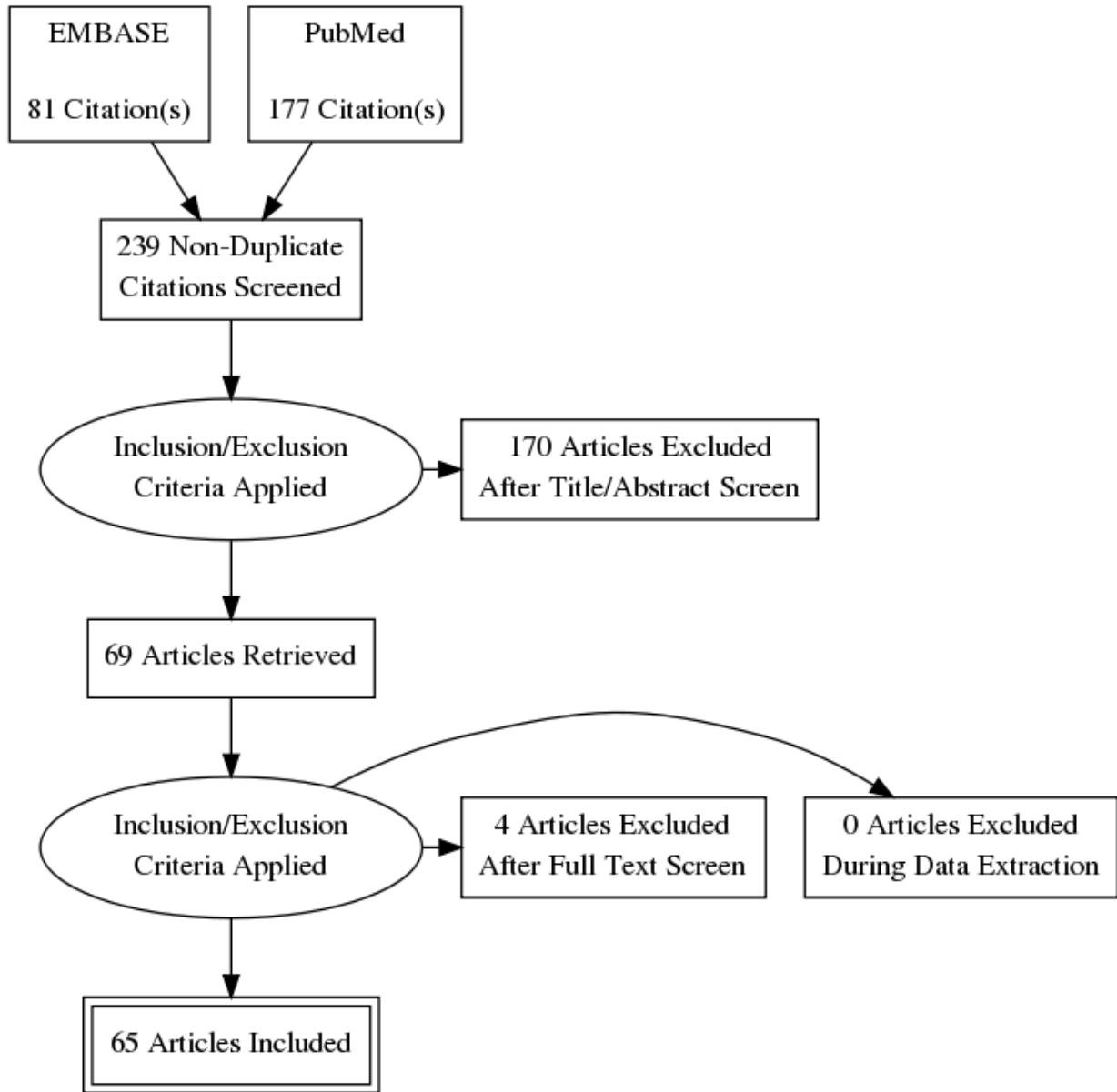
Briggs Institute Critical Appraisal Checklist for Randomized Controlled Trials, The Johanna Briggs Institute Critical Appraisal Checklist for Analytical Cross Sectional Studies, The Johanna Briggs Institute Critical Appraisal Checklist for Systematic Reviews, the Johanna Briggs Institute Critical Appraisal Checklist for Cohort Studies, and the Mixed Methods Appraisal Tool for Non-Randomized Studies.

Chapter 4 – Results

Search Results and Selection Process

Searches were conducted using EMBASE and PubMed databases. The search strings employed generated 81 citations from EMBASE and 177 citations from PubMed. After eliminating duplicate citations, a total of 239 citations were selected for relevancy screening. After this screening, 170 citations were excluded for lack of relevance. A full-text review of each source was then performed which further eliminated 4 citations for lack of relevance. After completing full-text review a total of 65 citations were selected for inclusion in the SLR. Specific steps and methodology are shown in Figure 1.

Figure 1: Detailed PRISMA Diagram: Review Methodology and Selection Process



Description of Studies

Table 4 summarizes selected citations including the study design type and pertinent topics for each selected source. Following the full-text review and data abstraction a total of 3 Qualitative Studies, 37 Quantitative Studies, 5 Randomized Controlled Trials, 6 Cross-Sectional Studies, 6 Systematic Reviews, and 8 Cohort Studies were identified. Each selected citation includes the PCMH model in tandem with utilization management, cost of health care, or improved health outcomes. Additionally, some citations include aspects of specialty care services, financial management, care coordination, and program evaluation. All of the selected citations include studies performed in the United States.

Selected Citations: Table 4

Afendulis, 2017	Quantitative Study	PCMH Model PCMH Implementation Health Care Costs Financial Management
Alexander, 2015	Cohort Study	PCMH Model PCMH Evaluation Health Care Costs Health-Related Outcomes PCMH Evaluation Health Care Costs Health-Related Outcomes
Almalki, 2018	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Bronstein, 2015	Quantitative Study	PCMH Model Utilization Management Health Care Costs Utilization Management

Burton, 2020	Quantitative Study	PCMH Model Utilization Management Health Care Costs Care Coordination
Colasurdo, 2022	Randomized Controlled Trial	PCMH Model Utilization Management Health Care Costs PCMH Evaluation
Cole, 2015	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Crits-Christoph, 2018	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Cuellar, 2016	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Cunningham, 2015	Quantitative Study	PCMH Model PCMH Evaluation Utilization Management
David, 2015	Quantitative Study	PCMH Model Utilization Management Health-Related Outcomes
Dorr, 2015	Randomized Controlled Trial	PCMH Model PCMH Implementation Strategies
Durfee, 2018	Quantitative Study	Care Coordination Health Care Costs Utilization Management Health-Related Outcomes
Enlow, 2017	Cohort Study	Care Coordination Utilization Management Health-Related Outcomes Social Determinants of Health
Fifield, 2013	Randomized Controlled Trial	PCMH Model PCMH Implementation Health-Related Outcomes Health Care Costs

Flieger, 2017	Quantitative Study	PCMH Model PCMH Evaluation Utilization Management Health Care Costs Health-Related Outcomes
Flottemesch, 2012	Quantitative Study	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes
Fontaine, 2011	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Friedberg, 2015	Quantitative Study	PCMH Model Utilization Management Health Related Outcomes PCMH Evaluation
Fu, 2022	Quantitative Study	PCMH Model Utilization Management Health Related Outcomes PCMH Evaluation
Goyal, 2014	Quantitative Study	PCMH Model Health-Related Outcomes Utilization Management Specialty Care
Graham, 2014	Cohort Study	PCMH Model Health-Related Outcomes Utilization Management Specialty Care
Green, 2017	Quantitative Study	PCMH Model Utilization Management Health Related Outcomes Care Coordination
Grove, 2020	Cohort Study	PCMH Model Utilization Management Specialty Care
Hebert, 2013	Quantitative Study	PCMH Model Utilization Management PCMH Evaluation Patient/Provider Satisfaction

Hoff, 2012	Systematic Review	PCMH Model PCMH Evaluation Health Related Outcomes Patient/Provider Satisfaction
Jones, 2016	Cross-Sectional Study	PCMH Model Utilization Management Health Care Costs PCMH Evaluation
Kohler, 2015	Quantitative Study	PCMH Model Utilization Management Health-Related Outcomes Case Coordination Specialty Care
Korenstein, 2016	Systematic Review	PCMH Model PCMH Evaluation Health-Related Outcomes Health Care Costs Utilization Management
Koshy, 2015	Qualitative Study	PCMH Model PCMH Implementation Health Care Costs Health-Related Outcomes
Lambert-Kerzner, 2012	Randomized Controlled Trial	Care Coordination Health Care Costs Health-Related Outcomes Specialty Care
Le, 2016	Cross-Sectional Study	PCMH Model Utilization Management Health Care Costs Care Coordination
Liang, 2020	Systematic Review	Care Coordination Utilization Management Health Care Costs Specialty Care
Lin, 2014	Cross-Sectional Study	PCMH Model Utilization Management Care Coordination

Liss, 2014	Quantitative Study	PCMH Model Utilization Management Health Care Costs PCMH Evaluation
Maeng, 2015	Quantitative Study	PCMH Model Care Coordination Utilization Management Health Care Costs Health-Related Outcomes
Marsteller, 2018	Quantitative Study	PCMH Model Utilization Management Health Care Costs Patient Satisfaction
McManus, 2021	Systematic Review	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes Financial Management PCMH Evaluation
Moran, 2011	Quantitative Study	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes Patient Satisfaction
Mosquera, 2014	Randomized Controlled Trial	PCMH Model Utilization Management Health Care Costs Health Related Outcomes
Neal, 2015	Cohort Study	PCMH Model Utilization Management Health Care Costs PCMH Implementation Strategies
Philpot, 2016	Quantitative Study	PCMH Model Health Related Outcomes Utilization Management
Pines, 2015	Quantitative Study	PCMH Model Utilization Management Health Care Costs

Randall, 2017	Quantitative Study	PCMH Model PCMH Evaluation Utilization Management Health Care Costs
Reddy, 2020	Cohort Study	PCMH Model Utilization Management Cost of Care
Reibling, 2016	Qualitative Study	PCMH Model Utilization Management Health Related Outcomes Social Determinants of Health
Rhodes, 2016	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Romaine, 2014	Cross-Sectional Study	Care Coordination Utilization Management Health Care Costs Specialty Care
Rosenthal, 2013	Quantitative Study	PCMH Model Health-Related Outcomes Utilization Management PCMH Evaluation
Rosenthal, 2015	Quantitative Study	PCMH Model Health-Related Outcomes Utilization Management PCMH Evaluation
Rosenthal, 2016	Quantitative Study	PCMH Model Cost of Care Health-Related Outcomes PCMH Implementation Strategies
Saynisch, 2021	Quantitative Study	PCMH Model Utilization Management PCMH Evaluation Patient/Provider Satisfaction
Shah, 2015	Quantitative Study	PCMH Model Utilization Management Health Care Costs Specialty Care

Sinaiko, 2017	Systematic Review	PCMH Model Health-Related Outcomes Health-Care Costs
Spees, 2020	Quantitative Study	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes
Stockbridge, 2014	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Timbie, 2017	Cross-Sectional Study	PCMH Model Utilization Management Health Care Costs Care Coordination
Van Hasselt, 2014	Quantitative Study	PCMH Model Utilization Management Health Care Costs
Veet, 2020	Systematic Review	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes
Waters, 2019	Cohort Study	PCMH Model Utilization Management Health Related Outcomes Health Care Costs
Werner, 2013	Quantitative Study	PCMH Model Utilization Management Health Care Costs Health-Related Outcomes PCMH Evaluation
Wong, 2016	Qualitative Study	PCMH Model Health-Related Outcomes PCMH Evaluation
Xie, 2021	Cross-Sectional Study	PCMH Model Health-Related Outcomes Health-Care Costs Utilization Management Patient Satisfaction

Xin, 2014	Cohort Study	PCMH Model Utilization Management Health Care Costs
Yoon, 2013	Quantitative Study	PCMH Model Utilization Management

Summary of Findings

The majority of selected citations were focused on the relationship between the PCMH model and utilization of health care services, specifically emergency departments and inpatient stays. In exploration of these sources, mixed results were seen. There are many instances in which a significant reduction in utilization was observed; however, as many articles indicate, this reduction in utilization was seen only in certain patient populations (Flottemesch, et al., 2012; Goyal, et al., 2014; Shah, et al., 2015; Rosenthal, et al., 2015; Saynisch, et al., 2021; Cunningham, et al., 2015; Green, et al., 2017; David, et al., 2015; Veet, et al., 2020). Furthermore, there are several sources that depict only minimal reduction in utilization. (Marstellar, et al., 2018; McManus, et al., 2021, Graham, et al., 2014; Grove, et al., 2020; Korenstein, et al., 2016; Waters, et al., 2019). Sources focused on specialty care practices employing a PCMH model or working directly with a PCMH primary care practice appear to show positive trends in utilization (Lambert-Kerzner, et al., 2012; Romaine, et al., 2014; Durfee, et al., 2018; Goyal, et al., 2014; Shah, et al., 2015).

In regards to the effects of PCMH care delivery as it corresponds to utilization of higher acuity health care services, there were thirty-one citations that found a significant positive impact to emergency department visits and inpatient stays that correlate to PCMH involvement (Alexander, et al., 2015; Almalki, et al., 2018; Burton, et al., 2020; Cole, et al., 2015; Cuellar, et al., 2016; Fontaine, et al., 2011; Fu, et al., 2022; Goyal, et al., 2014; Green, et al., 2017; Hebert, et al., 2013; Jones, et al., 2016; Lambert-Kerzner, et al., 2012; Lin, et al., 2014; Liss, et al., 2014;

Maeng, et al., 2015; Moran, et al., 2011; Mosquera, et al., 2014; Neal, et al., 2015; Pines, et al., 2015; Randall, et al., 2017; Reibling, et al., 2016; Rhodes, et al., 2016; Rosenthal, et al., 2013; Saynisch, et al., Shah, et al., 2015; 2021; Spees, et al., 2020; Stockbridge, et al., 2014; Wong, et al., 2016; Yoon, et al., 2013; Van Hasselt, et al., 2014; Veet, et al., 2020).

In contrast, there were a total of thirteen citations that cite no change or increased utilization in tandem with PCMH care delivery. (Bronstein, et al., 2015; Colasurdo, et al., 2022; Grove, et al., 2020; Kohler, et al., 2015; Le, et al., 2016; Flieger, et al., 2017; Friedberg, et al., 2015; Reddy, et al., 2020; Rosenthal, et al., 2015; Timbie, et al., 2017; Werner et al., 2013; Xie, et al., 2021, Xin, et al., 2014) And finally this SLR found nine citations with only minimal and non-significant changes to ED visits and inpatient stays for populations managed with a PCMH model (Cunningham, et al., 2015; David, et al., 2015; Fifield, et al., 2013; Flottemesch, et al., 2012; Graham, et al., 2014; Korenstein, et al., 2016 Marsetellar, et al., 2018; McManus, et al., 2021; Waters, et al., 2013).

Many included citations also depict impacts to quality of care or other health-related outcomes and the interplay with the PCMH model and these components. Again, mixed results appear to be present with nine sources citing improvement in a variety of care measures (Sinaiko, et al., 2017; David, et al., 2015; Lambert-Kerzner, et al., 2012; Maeng, et al., 2015; Romaine, et al., 2014; Enlow, et al., 2017; Goyal, et al., 2014; Rosenthal, et al., 2013; Alexander, et al., 2015) and seven citations eliciting no change in quality metrics (Flottemesch, et al., 2012; Rosenthal, et al., 2015; Kohler, et al., 2015; Korenstein, et al., 2016; Waters, et al., 2019; Werner, et al., 2013; Xie, et al., 2021).

To expand upon these factors and how it translates to financial impacts, there were a total of forty-two citations that compiled or extrapolated financial data as it corresponds to utilization

and improved quality metrics. Of these sources, a total of twenty-four citations demonstrated a significant reduction in total health care costs and reduced spending correlated with PCMH interventions (Afendulis, et al., 2017; Alexander, et al., 2015; Almalki, et al., 2018; Burton, et al., 2020; Cole, et al., 2015; Cuellar, et al., 2016; Durfee, et al., 2018; Flottemesch, et al., 2012; Fontaine, et al., 2011; Jones, et al., 2016; Liang et a., 2020; Liss, et al., 2014; Maeng, et al., 2015; McManus, et al., 2021; Moran, et al., 2011; Neal, et al.2015; Pines, et al., 2015; Randall, et al., 2017; Rhodes, et al. 2016; Rosenthal, et al., 2016; Spees, et al., 2020; Stockbridge, et al., 2014; Van Hasselt, et al., 2014; Veet, et al., 2020).

Conversely, there were a total of seventeen citations that reported no change in cost of care delivery or health care spending correlated with PCMH interventions (Bronstein, et al., 2015; Colasurdo, et al., 2022; Crits-Christoph, et al., 2018; Fifield, et al., 2013; Flieger, et al., 2017; Le, et al., 2016; Korenstein, et al., 2016; Koshy, et al., 2015; Marstellar, et al., 2018; Reddy, et al., 2020; Rosenthal, et al., 2015; Shah, et al., 2015; Sinaiko, et al., 2017; Waters, et al., 2019; Werner, et al., 2013; Xie, et al., 2021; Xin, et al., 2014) There was also one source that experienced increased cost of health care services in correlation with PCMH interventions (Timbie, et al., 2017).

There were two citations that included variables related to social determinants of health. Of these, one source indicated no improvements in health care disparities stemming from disparities in tandem with PCMH interventions (Reibling, et al., 2016). While the other source indicated improvement in continuity of care, compliance, and reduced inequities in correlation with the PCMH model (Enlow, et al., 2017).

This SLR also identified six total citations that discussed PCMH implementation strategies and factors associated with the sustainability of the model (Dorr, et al., 2015; Fifield, et al., 2013; Flieger, et al., 2017; Koshy, et al., 2015; Neal, et al., 2015; Rosenthal, et al., 2016).

Quality Assessment

Among the selected citations there was one qualitative study (Reibling, N., 2016) of high quality. Of the remaining qualitative studies, one (Koshy et al., 2015) did not clearly address whether the influence of the research was present on the researcher and vice-versa while the other (Wong, at al., 2016) did not address this concept at all. See Table 4 for individual critical appraisal results for qualitative studies.

Table 4: Qualitative Studies – Critical Appraisal(s)

Citation	Is there congruity between the stated philosophical perspective and the research methodology?	Is there congruity between the research methodology and the research question or objective?	Is there congruity between the research methodology and the methods used to collect data?	Is there congruity between the research methodology and the representation and analysis of data?	Is there congruity between the research methodology and the interpretation of results?	Is there a statement locating the researcher culturally or theoretically?	Is the influence of the researcher on the research and vice-versa, addressed?	Are participants and their voices, adequately represented?	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Do conclusions drawn in the research report flow from the analysis or interpretation of the data?
Koshy, 2015	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes
Reibling, 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wong, 2016	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

The SLR included thirty-seven quantitative studies of various design. Among these citations, there were thirty-one of high quality (Afendulis, et al., 2017; Almalki, et al., 2018; Bronstein, et al., 2015; Burton et al., 2020; Cole, et al., 2015; Cuellar, et al., 2016; David, et al.,

2015; Durfee, et al., 2018; Flieger, S., 2017; Flottemesch, et al., 2012; Fontaine, et al., 2011; Fu, et al., 2022; Goyal, et al., 2014; Green, et al., 2017; Hebert, et al., 2013; Kohler, et al., 2015; Maeng et al., 2015; Marstellar, et al., 2018; Moran et al., 2011; Philpot, et al., 2016; Pines et al., 2015; Randall, et al., 2017; Rosenthal, et al., 2013; Rosenthal, et al., 2015; Rosenthal, et al., 2016; Saynisch, et al., 2021; Shah, et al., 2015; Spees, et al., 2020; Stockbridge, et al., 2014; Van Hasselt, et al., 2014, Yoon, et al., 2013). There were two citations that did not make it clear whether or not confounding factors described in the study were accounted for in the design (Crits-Christoph, et al., 2018; Rhodes, et al., 2016). Similarly, there were two additional studies (Friedberg, et al., 2015; Werner, et al., 2013) that did not review confounding factors in the analysis or design. There was one study (Cunningham, et al., 2015) that did not appear to have complete outcome data. There was also one citation (Liss, et al., 2013) that was unclear if the intervention was structured as intended. See Table 5 for individual critical appraisal results for quantitative studies.

Table 5: Quantitative Studies – Critical Appraisal(s)

Citation	Are the participant representative of the target population?	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Are there complete outcome data?	Are the confounding factors accounted for in the design and analysis?	During the study period, is the intervention administered (or exposure occurred) as intended?
Afendulis, 2017	Yes	Yes	Yes	Yes	Yes
Almalki, 2018	Yes	Yes	Yes	Yes	Yes
Bronstein, 2015	Yes	Yes	Yes	Yes	Yes
Burton, 2020	Yes	Yes	Yes	Yes	Yes
Cole, 2015	Yes	Yes	Yes	Yes	Yes
Crits-Christoph, 2018	Yes	Yes	Yes	Unclear	Yes
Cuellar, 2016	Yes	Yes	Yes	Yes	Yes
Cunningham, 2015	Yes	Yes	No	Yes	N/A

David, 2015	Yes	Yes	Yes	Yes	Yes
Durfee, 2016	Yes	Yes	Yes	Yes	Yes
Flieger, 2017	Yes	Yes	Yes	Yes	Yes
Flottemesch, 2012	Yes	Yes	Yes	Yes	Yes
Fontaine, 2011	Yes	Yes	Yes	Yes	Yes
Friedberg, 2015	Yes	Yes	Yes	No	N/A
Fu, 2022	Yes	Yes	Yes	Yes	Yes
Goyal, 2014	Yes	Yes	Yes	Yes	Yes
Green, 2017	Yes	Yes	Yes	Yes	Yes
Hebert, 2013	Yes	Yes	Yes	Yes	Yes
Kohler, 2015	Yes	Yes	Yes	Yes	Yes
Liss, 2013	Yes	Yes	Yes	Yes	Unclear
Maeng, 2015	Yes	Yes	Yes	Yes	Yes
Marsteller, 2018	Yes	Yes	Yes	Yes	Yes
Moran, 2011	Yes	Yes	Yes	Yes	Yes
Philpot, 2016	Yes	Yes	Yes	Yes	Yes
Pines, 2015	Yes	Yes	Yes	Yes	Yes
Randall, 2017	Yes	Yes	Yes	Yes	Yes
Rhodes, 2016	Yes	Yes	Yes	Unclear	Yes
Rosenthal, 2013	Yes	Yes	Yes	Yes	Yes
Rosenthal, 2015	Yes	Yes	Yes	Yes	Yes
Rosenthal, 2016	Yes	Yes	Yes	Yes	Yes
Saynisch, 2021	Yes	Yes	Yes	Yes	Yes
Shah, 2015	Yes	Yes	Yes	Yes	Yes
Spees, 2020	Yes	Yes	Yes	Yes	Yes
Stockbridge, 2014	Yes	Yes	Yes	Yes	Yes
Van Hasselt, 2014	Yes	Yes	Yes	Yes	Yes
Werner, 2013	Yes	Yes	Yes	No	Yes
Yoon, 2013	Yes	Yes	Yes	Yes	Yes

This review also included five randomized controlled trials. Of these sources, two were of high quality (Lambert-Kerzner, et al., 2016; Mosquera, et al., 2014). The remaining three randomized controlled trials (Colasurdo, et al., 2022; Dorr, et al., 2015; Fifield, et al., 2013) did not have a methodology in place for blinding those delivering the treatment; however this was

taken into account in the analysis of results. See Table 6 for individual critical appraisal results for randomized controlled trials.

Table 6: Randomized Controlled Trials – Critical Appraisal(s)

Citation	Was true randomization used for assignment of participants to treatment groups	Was allocation to treatment groups concealed?	Were treatment groups similar at baseline?	Were participants blind to treatment assignment?	Were those delivering treatment blind to treatment assignment?
Colasurdo, 2022	Yes	Yes	Yes	Yes	No
Dorr, 2015	Yes	Yes	Yes	Yes	No
Fifield, 2013	Yes	Yes	Yes	Yes	No
Lambert-Kerzner, 2012	Yes	Yes	Yes	Yes	Yes
Mosquera, 2014	Yes	Yes	Yes	Yes	Yes

There were six total cross-section studies included in the selected citations (Jones, et al., 2016; Le, et al., 2016; Lin, et al., 2014; Romaine, et al., 2014; Timbie, et al., 2017; Xie, et al., 2021) all of which were found to be of high quality. See Table 7 for individual critical appraisals for cross-sectional studies.

Table 7: Cross-Sectional Studies – Critical Appraisals

Citation	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?
Jones, 2016	Yes	Yes	Yes	Yes	Yes
Le, 2016	Yes	Yes	Yes	Yes	Yes
Lin, 2014	Yes	Yes	Yes	Yes	Yes
Romaine, 2014	Yes	Yes	Yes	Yes	Yes
Timbie, 2017	Yes	Yes	Yes	Yes	Yes
Xie, 2021	Yes	Yes	Yes	Yes	Yes

There were a total of six systematic reviews in the final list of citations. Of these, one (Korenstein, et al., 2016) was found to be of high-quality. There were four sources which were unclear in that more than one reviewer performed critical appraisals of included sources (Hoff, et al., 2012; Liang, et al., 2020; McManus, et al., 2021; Veet, et al., 2020). There was also one source that did not address likelihood of publication bias (Sinaiko, et al., 2017). See Table 8 for individual critical appraisal results for systematic reviews.

Table 8: Systematic Reviews – Critical Appraisals

Citation	Is the review question clearly stated?	Were inclusion criteria appropriate for the review question?	Was the search strategy appropriate?	Were the sources and resources used to search for studies adequate?	Were the criteria for appraising studies appropriate?	Was critical appraisal conducted by two or more reviewers, independently?	Were there methods to minimize errors in data extraction?	Were the methods used to combine studies appropriate?	Was the likelihood of publication bias assessed?	Were recommendations for policy and/or practice supported by the reported data?	Were specific directives for new research appropriate?
Hoff, 2012	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
Korenstein, 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Liang, 2020	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
McManus, 2021	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
Sinaiko, 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes
Veet, 2020	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes

Included in the list of citations there were also eight cohort studies. Among these, five sources were of high quality (Graham, et al., 2014; Grove, et al., 2020; Neal, et al., 2015; Reddy, et al., 2020; Xin, et al., 2015) There were three citations that were unclear in articulating strategies to address incomplete follow up (Alexander, et al., 2015; Enlow, et al., 2017; Waters, et al., 2019) See Table 9 for individual critical appraisals for cohort studies.

Table 9: Cohort Studies – Critical Appraisals

Citation	Were the two groups similar and recruited from the same population?	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Was the exposure measured in a valid and reliable way?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	Were the outcomes measured in a valid and reliable way?	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Were strategies to address incomplete follow up utilized?	Was appropriate statistical analysis used?
Alexander, 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes
Enlow, 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes
Graham, 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grove, 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neal, 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reddy, 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Waters, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes
Xin, 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Chapter 5 – Discussion

Summary

This Systematic Literature Review has compiled a significant number of resources and analyses focused on exploring the relationship between the PCMH model of care delivery and factors ranging from quality of care, utilization of health care services, as well as system considerations related to the success of the PCMH model.

In consideration of the findings here, there appear to be positive connections with the PCMH model and these aforementioned concepts. However, results are mixed. As many citations in this SLR point out, the diversity of health care practices and health service organizations and the populations they serve create barriers to fully encapsulating the strategies

employed by the PCMH model and their propensity to affect these populations. With the constant evolution of medicine and the industry itself, these experiences are, to some degree, in flux. Another key factor for consideration is the impact of individual components of the PCMH model compared to the whole. In many instances there are certain components which appear to have greater impacts than others. Oftentimes, the burden of implementation, both in terms of systems and processes but also the cost to undertake the transformation, remains a significant barrier to adoption. Exploring foundations of the model that serve to create the largest impact and reducing these burdens may serve to promote heightened outcomes and increased ease of adoption. In this manner, continued exploration of data surrounding this model and strategies to reduce financial burden, promote higher quality care, and increase interoperability remain of great importance.

Additionally, a common barrier found throughout this review lies in health care systems surrounding service providers. Particularly, reimbursement models and value-based arrangements effectively supporting and reimbursing practices in a manner that promotes this shift in care delivery. Changes in the health care payer models will undoubtedly impact the financial costs/benefits explored in this analysis as more reimbursement practices shift toward value-based models.

Altogether, the long-term success of the PCMH model in reducing health care costs and improving the quality of care across both primary care and specialty care practices remains somewhat unknown. More research is desired to explore details surrounding its efficacy and potential to positively impact care delivery.

Public Health Implications

Growing health care costs in the United States continue to raise alarms from health care providers, policy makers, and economists, alike. This uncontrolled growth continues to point to a direction of unsustainability. The existence of fragmented care systems, a growing population of aging adults, and increasing wasted spending are contributing to this dilemma at an alarming rate. While the consequences of these inflated costs will undoubtedly be far reaching, it will inevitably affect levels of granularity down to the individual patient. As is the case with downstream costs and health care inequities this has the potential to disproportionately impact vulnerable populations in a significant manner. Even now, current findings show that growing health care costs limits access to essential medications and declines in health status (Lexchin & Grootendors, 2004). This remains a significant public health issue and requires exploration and innovation to develop solutions and new models to alleviate these burdens on systems and patients, alike.

Furthermore, when considering the driving factors of rising costs and potential foundational changes, understanding these forces are important in developing appropriate solutions. The rising burden of chronic care management is a significant contributor which has the potential to be influenced by primary care providers. As of 2014, 60% of American adults experienced at least one chronic medical condition with 42% experiencing at least two such conditions (Buttorf, et al., 2017). In this regard, foundational changes that focus on some of these cost-driving conditions and promote heightened avenues of caring for these patients have significant potential to elicit positive improvement to controlling costs for these populations.

In consideration of the components of PCMH intervention, a primary-care focused intervention that is designed to promote efficiency and care coordination while alleviating

barriers to care has potential in meeting this goal while simultaneously striving for health equity. In order to further explore the viability of this intervention, this SLR was performed to analyze available data and synthesize current information into succinct and tangible insights into its potential efficacy.

Strengths and Limitations

This SLR has many inherent strengths that accompany a work of this design. This work is very reproducible and utilizes explicit methodology which is reported in the body of this review. The transparency in the information provides ample ability to explore, validate, and critique the information provided. Additionally, utilizing the detailed methodology employed here, this review allows for a detailed synthesis of information from a wide body of sources. Specific to this SLR, the topics surrounding PCMH were explored from a variety of perspectives. In efforts to truly report on its ability to impact care delivery and major systems of health care delivery, this review explored its capacity from different sources, measures, and locations.

There are also inherent weaknesses to be considered. While the employed search methodology and inclusion/exclusion criteria strived to remain agnostic of many factors, there remains the potential for bias in many forms, including publication bias and bias found in the quality assessments of the citations. This SLR did not have multiple reviewers take part in the application of the critical appraisal process which creates the potential for this bias to exist. It is the hope of the reviewer that methodology employed in selecting sources and reviewing information identified here that sufficient steps were taken to minimize such bias.

Gaps in Evidence

Studies in this review were heavily weighted toward quantitative study designs. Examining the PCMH model further may require different methodology to further explore the strengths and weaknesses of the model. Utilizing additional databases may have provided more sources for evaluation. This SLR was also prominently comprised of citations exploring multiple medical homes in wide swaths. Stratifying the data further by practice size or location may depict additional nuances surrounding the PCMH model in different environments.

Conclusions

This SLR was conducted to review the current body of knowledge and available information surrounding the PCMH model of care delivery and to evaluate its potential impacts guided by the following research questions:

Is the PCMH model associated with a reduction in utilization of emergency room or inpatient hospital services?

In terms of the relationship between the PCMH model and utilization of emergency department and inpatient hospital services there are mixed results regarding its efficacy to reduce utilization of these services. Within this review, the majority of sources indicate positive findings surrounding PCMH strategies and the correlation between reduced utilization. However, there are similarly substantial resources that indicate little to no correlation between PCMH intervention and reduction in these encounters. However, it is possible that more time and additional data may be needed to observe the changes.

Is there a financial benefit for individual health care organizations/practices to implement the PCMH model?

In the analysis of the observed financial benefits, the results were again mixed on the extent of cost savings or reduction in health care spending. There were many instances in which reduced health care spending was observed in correlation with PCMH interventions; however, there were similarly instances in which this was not observed. It appears that other factors may have a significant influence on the financial returns associated with this model of care delivery and more time should be spent in examining external factors and pre-existing systems when evaluating PCMH as a target intervention.

What factors exist as barriers to the success or implementation of the PCMH model?

This SLR outlines a variety of factors contributing to the viability of PCMH transformation and its long-term sustainability. Many sources highlighted in this review point out the significant implications that the relevant patient population may elicit on outcomes of PCMH interventions. In many instances, the PCMH model holds the greatest possibility of success when managing certain, targeted chronic conditions. Additionally, the systems in place with other service providers and specialty practices play a vital role in the success of care coordination and its ability to create positive impacts. Practices should carefully consider the population of patients to be managed and generate key insights into conditions, health disparities, and other determinants when planning to implement PCMH transformation. Furthermore, the health care

reimbursement landscape presents significant challenges in creating the return on investment for such models of care. As commercial payors and other value-based incentive programs are put in place, PCMH interventions have greater success to create significant financial returns. Until such time as these are formally reviewed and put in place, practices should carefully consider the reimbursement landscape and available systems to support PCMH transition.

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Competencies

Foundational Competency

Evidence-based Approaches to Public Health: Interpret results of data analysis for public health research, policy, or practice.

This foundational competency is a key component of the investigation this capstone project entails. This SLR involved the compilation and analyzation of data and scholarly articles surrounding the PCMH model, a system of primary care delivery with potential for far-reaching impacts across the range of health care services received by a patient population. Additionally, this SLR explored the larger fiscal impacts that this system of primary care delivery has upon the broader network of care. This capstone project provided a detailed analysis and interpretation of gathered data surrounding the PCMH model and seek to further define such impacts.

Concentration Competencies

Analyze and address key factors relevant to the implementation of evidence-informed health promotion strategies.

This concentration competency is a significant part of exploring the research questions within this capstone project. As a part of this project, exploration on key barriers to implementation of the PCMH model was explored. This SLR explored primary care practices of different scope and size that have implemented this model of care delivery to examine potential attributes that may lend themselves to success or viability of the model in different systems. By exploring these characteristics, it has helped to further define factors that may be relevant to implementation of the PCMH model.

Apply administrative and management plans for health promotion strategies using a systems approach.

This concentration competency was integrated into this capstone project. The analysis and findings of this SLR helped to further define the impacts of the PCMH model from a variety of perspectives including any benefits to heightened care coordination resulting in reduced acute care setting utilization as well as fiscal impacts to health service organizations and the broader systems. Additionally, exploring barriers to implementation or sustainability provides information to administrative teams seeking to explore this model in a variety of healthcare settings. By providing this analysis and summary of data, these teams can evaluate impacts to not only their bottom line, but also the care of patients within the population they serve. They can better evaluate and plan using a systems approach and present greater understanding of potential effects from multiple perspectives and simultaneously navigate anticipated barriers.

Biography

Garrett Vetter is a student at the University of Nebraska Medical Center College of Public Health pursuing a Master of Public Health with a concentration in Public Health Practice. Mr. Vetter currently serves as the Administrator of an independent ambulatory surgery center, a real estate investment company, an anesthesia services provider, and multiple locations providing outpatient specialty care services in both Kearney and Grand Island, Nebraska. His responsibilities include operational oversight, fiscal management, and strategic planning across these entities. Mr. Vetter has worked in a variety of healthcare settings across his career, including non-profit/indigent care, acute care hospitals, and specialty private practices. Mr. Vetter also works part-time as a freelance consultant, assisting other medical practices and ambulatory facilities to streamline operational processes, generate positive cash-flow, and build positive culture by engaging employees and providers to promote success in their organizations. In these various capacities, Mr. Vetter has worked with multiple accreditation agencies, led multitudes of projects including facility renovations and other construction projects, electronic health record implementations, and mergers of multiple practices. Mr. Vetter possesses an innate fascination with systems of healthcare delivery and has a passion for promoting efficiency and delivering positive experiences for healthcare providers, employees, and most importantly patients. In his free time, Mr. Vetter enjoys spending time outdoors with his fiancé and their dog. He is an avid fisherman, a severely amateur golfer, and a fan of classic literature and western philosophy. However, his true passion is engaging with those that he can impact in a positive fashion and crafting change in systems to promote the health and well-being of providers and patients.

Garrett L. Vetter

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Kearney, NE 68847

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HEALTHCARE OPERATIONAL LEADER

Operational Efficiency Regulatory Compliance Physician Recruitment
Patient Experience Employee Engagement

Innovative, high-performing, and versatile administrative professional with experience across a wide array of healthcare settings offering a career with a history of contributions ranging from heightened employee and patient satisfaction, improvement in quality care delivery models, and better outcomes through operational efficiency and compassionate leadership. Adept at cross-functional leadership and performance management and cultivating strong, long-term strategic partnerships yielding high returns. Driven to produce results and meaningful relationships.

EDUCATION:

Master of Public Health, Public Health Practice – Degree anticipated August, 2022
University of Nebraska Medical Center, Omaha, NE
(Aug. 2017-Present)

Bachelor of Science, Psychobiology/Biology Double Major
University of Nebraska at Kearney, Kearney, Nebraska
(Aug. 2011-May 2017)

Emergency Medical Technician-Basic
Central Community College, Kearney, NE
(Sep. 2014-Mar. 2015)

INTERNSHIP:

Kearney Area Community Foundation, August, 2013-October, 2015
Judi Sickler, CEO
412 W. 28th Street, Suite 12
Kearney, NE 68845

- Provided administrative support for 150+ local and national non-profit organizations including fundraising, financial management and accounting, marketing, and strategic planning.
 - Served as a member of the team to plan and implement the first online fundraising event for the Kearney area community termed “Give Where You Live” facilitating donations of over \$6.5 million for local nonprofit organizations.
-

VOLUNTEER WORK/ACTIVITIES:

Open Arms Community Care Council, May, 2018 – January, 2021

Michael Moran, Board Chair

- Served as advisory board member to planning committee seeking to address health inequities among Dawson County residents.
- Utilized evidence-based practices for health promotion program planning to coordinate needs assessments and provide key data and analysis exploring health disparities associated with primary care and preventative screening across county residents.

Susan G. Komen Foundation – Nebraska, November, 2017 – November, 2021

Karen Daneu, Executive Director

8707 W. Center Rd. Ste. 101, Omaha, NE 68124

- Served on committee for Nebraska/Iowa reviewing grant applications in accordance with capital campaign budget(s)

Served on Nebraska/Western Iowa Susan G. Komen Mission Committee

PROFESSIONAL AFFILIATIONS:

American College of Healthcare Executives – Member – April, 2018-Present

Medical Group Management Association – Member – December, 2018-Present

Nebraska Medical Group Management Association – State Board of Directors – September, 2019-Present

Nebraska Public Health Association – Member – January, 2018-Present

Gothenburg Chamber of Commerce – Board of Directors Member – December, 2019-February, 2021

Gothenburg Rotary – Member – July, 2019-Present

AWARDS/HONORS:

UNMC Nekuda-Swartz Award for Public Health Impacts in Rural/Tribal Nebraska - 2019

WheatRidge Ministries Emerging Leader 2016 Nominee

Leadership Dawson County Class #16 – August, 2018 - Present

Leadership Kearney Class #26 – May, 2016 – May, 2018

PROFESSIONAL EXPERIENCE:

Kearney Pain Treatment Center, February, 2021 to Present

Administrator

Burt McKeag, MD, Managing Member

920 E. 56th Street, Kearney NE 68847

- Provided direct oversight of a physician-owned, free-standing ambulatory surgery center and multiple business units contributing to the provision of interventional pain medicine in central Nebraska.
- Implemented and maintained a variety of strategies promoting fiscal stewardship resulting in lower cost of providing services and heightened profitability.
- Coordinated the alignment of multiple ambulatory clinics to streamline a variety of workflows and processes to promote increased staff satisfaction and heightened efficiency for multiple organizations and partners.

- Managed and lead a variety of projects and quality improvement initiatives including the facility's first accreditation, improved benchmarking activities, and improved patient satisfaction.

Gothenburg Health, April, 2018 to February, 2021

Director of Clinic Operations

Tinna Therrien, RN, BSN, Chief Operating Officer

910 20th Street, Gothenburg, NE 69138

- Provided direct oversight of a provider-based rural health clinic, outpatient hospital specialty clinic, and satellite provider-based clinic in central Nebraska.
- Managed and lead a variety of projects and quality improvement initiatives including patient-centered medical home (PCMH) recognition, telemedicine implementation, transitional care programs, and several others.
- Fostered high employee engagement and communication, directly influencing patient satisfaction and experience.

HelpCare Clinic, October, 2015 to April, 2018

Clinic Operations Manager

Angela Williams, Pharm.D., Board Chair

3015 Avenue A Kearney NE, 68847

- Efficiently administrated day-to-day operations of Kearney, Nebraska's first free and charitable, safety net clinic, maintained all reporting capabilities of electronic medical records and provided professional oversight of all clinic operations and fiscal oversight.
- Recruited multi-specialty care providers to and coordinated over 200 employees/volunteers to provide services to uninsured and impoverished residents of central Nebraska.

KEY STRENGTHS:

- Operational Analysis and Efficiency
- Fiscal Stewardship
- Long-Term Strategic Planning
- Public Speaking
- Evidence-Based Leadership
- Revenue Cycle Improvement
- Payer Contracting/Credentialing and Negotiations
- Risk Management/Compliance
- Culture Building

PRESENTATIONS:

Seminar, "Connected Coordination: Importance of Bidirectionality in Referral Patterns", Nebraska Parish Nurse's Association Spring Conference, Kearney, NE, May, 2016

Seminar, “The Patient-Centered Medical Home: Path to Implementation in a Rural Practice”, Cerner Community Works Conference, Kansas City, MO, April, 2019

Seminar, “The Patient-Centered Medical Home: The Value of Systems-Approach to Healthcare Delivery”, Cerner National Health Conference, Kansas City, MO October, 2019

PUBLICATIONS:

None
