REDUCING HOSPITAL READMISSIONS - BEYOND THE FOUR WALLS: AN INTEGRATIVE REVIEW

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirement for the degree

Of Doctor of Nursing Practice

By

Marlene Susan Smalley

Liberty University

Lynchburg, VA

September, 2021

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Abstract

Thirty-day hospital readmissions have been a matter of national concern for several years and efforts to reduce readmission rates are of high priority for all health systems. Innovative solutions must be considered for this costly problem. This integrative review seeks to synthesize information about risk stratification, causes of readmissions, and interventions to reduce readmissions, and to define community partnerships that support the reduction of 30-day readmission rates. The integrative review will inform stakeholders about "beyond the four walls" strategies to reduce readmissions. Building upon nursing science, informing research, and facilitating policy initiatives, this review will serve as a call to action for healthcare systems.

Key words: hospital readmissions, adults, community, partnerships, preventing

Acknowledgments

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List of Abbreviations

Affordable Care Act (ACA)

Agency for Healthcare Research and Quality (AHRQ)

Area Agencies on Aging (AAA)

Centers for Disease Control and Prevention (CDC)

Centers for Medicare and Medicaid Services (CMS)

Collaborative Institutional Training Initiative (CITI)

Community-Based Organizations (CBOs)

Community Health Worker (CHW)

Doctor of Nursing Practice (DNP)

Federally Qualified Health Center (FQHC)

Hospital Readmission Reduction Program (HRRP)

Institutional Review Board (IRB)

Integrative Review (IR)

Levels of Evidence (LOE)

Nurse Practitioner (NP)

World Health Organization (WHO)

SECTION ONE: FORMULATING THE REVIEW QUESTION

Introduction

Hospital readmissions have been a matter of national attention for several years due to the high cost and challenges associated with them (Tezcan, 2021). Thirty-day readmissions are defined as unplanned recurrent returns to the hospital within 30-days of hospital discharge and rates of readmission are closely associated with overall quality of care (Lin, 2015). Unplanned 30-day readmissions are estimated to cost American taxpayers $26 billion annually, and preventable rehospitalizations cost upwards of $17 billion every year (Wood, 2015). Some studies suggest that up to 36.2% of early readmissions within seven days are preventable and involve problematic processes during and after the hospital stay (Takahashi, 2020). Moreover, almost 75% of 30-day Medicare readmissions are believed to be preventable (Nelson & Pulley, 2015).

In addition to the overall unnecessary cost of readmissions there are also significant financial consequences for healthcare institutions with high readmission rates (Wood, 2015). Beginning in October 2012 the Centers for Medicare and Medicaid Services (CMS) began imposing significant financial penalties on hospitals when readmission rates were excessively high (Long et al., 2017). To date it is estimated that hospitals have been penalized more than $3 billion dollars due to higher than expected 30-day readmission rates (Wadhera et al., 2021). This has led to a call to action to consider strategies to reduce readmission rates. Some strategies discussed in the literature have included individualized discharge planning by health system personnel and extensive education for patients and families; however, readmission rates remain high and continue to be a burden for health systems, payors, and patients (Lin, 2015).

Strategies to improve readmission rates must include strategies "beyond the four walls." Partnerships with community-based organizations (CBOs) should be considered since they are valuable contributors to the health of the community and are also key stakeholders in patient outcomes and efforts to reduce hospital readmissions (Wilcox et al., 2018). CBOs include non-profit organizations, formal and informal community groups, and social service agencies which work at the local level to meet the needs of individuals; they are supported by volunteers, supporters, patrons, clients, members, and attendees (Centers for Disease Control and Prevention, 2021). Partnerships between health systems and CBOs can break down silos, improve communication, and address the specific needs of individuals (Hilts et al., 2021). Such partnerships are key to improving readmission rates.

Background

The Affordable Care Act (ACA) of 2010 targeted hospital readmissions as an area for care improvement and potential cost savings (Wilcox et al., 2018). Healthcare systems were charged with developing strategies to reduce readmissions or face penalties when readmission rates were high. Transitional care models were implemented to address the problem of high readmission rates; however, the literature clearly demonstrates that rates remain unacceptably high (Hung et al., 2018). Effective strategies to improve readmission rates in non-profit community-based hospitals must include community partnerships "outside the four walls" to meet the needs of those especially at risk of readmission to the hospital (Carter et al., 2021). Health systems must partner and work collaboratively with CBOs to address the specific risk factors and social needs of community members and prevent hospital readmissions (Wilcox et al., 2018).

This integrative review (IR) included studies related to partnerships between non-profit community-based health systems and CBOs to reduce rates for adults at risk of readmission. Examining what is known about these partnerships will build upon nursing science, inform research and practice, and facilitate policy initiatives to standardize practice. This review serves as a call to action and provides a springboard for health systems looking to improve readmission rates.

Defining Concepts and Variables

The concepts and variables of interest for this IR included: readmissions; non-profit community-based health systems; CBOs; the patient; and types of partnerships.

Readmissions. Readmissions were a variable of interest for this IR and are defined as unplanned recurrent returns to the hospital within 30-days of hospital discharge (Lin, 2015). CMS has focused on 30-day readmissions and penalizes hospitals for excessive 30-day readmission rates (Wadhera et al., 2021). Therefore, 30-day rates were a variable of interest rather than 60-day, 90-day, or 120-day readmission rates.

Readmission rates of hospitals are compared to other hospitals with a similar proportion of patients eligible for Medicare (Centers for Medicare & Medicaid Services, 2021). If the readmission rates are excessive when compared to similar health systems, a financial penalty is imposed. Readmission rates of patients with the following diagnoses are monitored: acute myocardial infarction (MI); chronic obstructive pulmonary disease (COPD); heart failure (HF); pneumonia; coronary artery bypass graft (CABG) surgery; and elective primary total hip arthroplasty and/or total knee arthroplasty.

Non-profit community-based health systems. Non-profit community-based health systems are those that are not subject to certain state or federal taxes; however, they must report

on the amount of community benefit they contribute to their community of residence (Birmingham & Oglesby, 2018). They do not raise capital through investors, and are therefore, not responsible to shareholders. However, they do answer to a board of directors and stakeholders. Non-profit community-based healthcare systems are especially vulnerable to the financial impact of readmissions since their costs have risen at a higher rate than revenues over the past several years which has resulted in a net operating loss (Birmingham & Oglesby, 2018). This fact makes it imperative for non-profit community-based healthcare systems to develop strategies and solutions to reduce readmissions.

CBOs. CBOs are variables of interest and include: non-profit organizations, formal and informal community groups, and social service agencies that work at the local level to meet community needs (Centers for Disease Control and Prevention, 2021). Furthermore, CBOs employ paid workers, volunteers, supporters, patrons, clients, members, and attendees who work together to integrate medical and social services to address patient needs (Hung et al., 2018). CBOs offer different strengths and attributes to positively affect the patient experience. Efforts to reduce readmissions aim to address factors that lead to readmissions and CBOs have been shown to positively contribute to those efforts (Takahashi et al., 2020).

The patient. The patient is another variable and is defined as an individual over the age of 18 that has been admitted to a non-profit community-based health system and discharged into the community. Patients suffer the negative psychological and physiological consequences due to readmissions and would benefit from decreased readmission rates (Wilcox et al., 2018).

Types of Partnerships. Types of partnerships between health systems and CBOs are of interest for this IR. The concept of partnership does not have a strict definition for this IR; rather, it refers to the cooperation between health systems and CBOs to serve the needs of patients and

community members. The types of partnerships in this review include: health system staff and CBOs with clinical staff; health system staff and CBOs/academic institutions; health system staff and CBOs with non-clinical staff.

Rationale for Conducting the Review

Readmission rates have been a focus of healthcare since 2012 when the Affordable Care Act (ACA) created demand and incentives to reduce readmission rates (Nelson & Pulley, 2015). This law required health systems to be more accountable for outcomes and tied payment for services to readmission rates. Penalties are applied when a hospital's 30-day readmission rates are substantially higher than the national average. Health systems have been incentivized to make more concerted efforts to improve patient outcomes and make quality the focus of all care provided (Nelson & Pulley, 2015). Hospitals of all sizes have been affected by these changes in reimbursement. Many of these systems have sought to improve readmission rates by focusing on transitional care and developing readmission programs (Miller et al., 2020).

While improvements have been considered, there is still much progress to be made as evidenced by high readmission rates reported publicly by CMS (Centers for Medicare & Medicaid Services, 2021). The IR examined readmission rates and the significance of partnerships between health systems and CBOs working to reduce readmissions. Types of partnerships between health systems and CBOs were also examined through the IR, and this information will serve to address the call to action necessary to reduce readmissions. Strategies for change must be implemented and consistent with the culture and characteristics of the health system involved. Therefore, the mission, vision, and values of an organization must also be considered before implementing new strategies.

Mission and Vision

The mission and vision of the health system are essential to consider when planning change and soliciting support from stakeholders. The mission statement serves to clarify the purpose of the health system and drive efforts within the system; the vision statement clarifies the future state of the health system and directs the strategic plan (MacLeod, 2016). Equally important to consider are the values of the health system which articulate core principles and drive staff behavior. These values define the culture of the organization. Examples include: respect, integrity, teamwork, excellence, innovation, and professionalism (MacLeod, 2016). Common themes in mission and vision statements also include the health and wellness of the community which indicates that health systems are very interested in discovering ways to improve readmission rates (MacLeod, 2016).

The value of a project is supported when it helps to carry out the mission and vision; and considers the values of a health system. Teamwork is a core value and includes collaboration and coordination of care between healthcare providers to prevent readmissions. Therefore, "looking beyond the four walls" of the health system to partner with CBOs and improve readmission rates is relevant to stakeholders.

Stakeholders

Stakeholders offer keen insight into the problem of readmissions. Those in healthcare systems that have a stake in readmission rates include: health system administrators, board members, finance managers, and patients who are directly impacted by readmissions. CBOs are also stakeholders and noted in the literature as partners with health systems working to improve readmission rates.

Triggers

Problems that provide motivation for change are referred to as triggers, since they cause stakeholders to acknowledge the problems and initiate action (Melnyk & Fineout-Overholt, 2015). The triggers for this IR included readmission rates and the cost of high readmission rates.

Readmission Rates. Data for readmission rates can be found on websites created by CMS or through software purchased by health systems. The benchmarking data compares the readmission rates of a non-profit community-based health system to other health systems and national averages. This data is analyzed by healthcare systems and is also publicly reported on websites so consumers can make informed decisions about their healthcare choices (Centers for Medicare & Medicaid Services, 2021). Health systems are in direct competition with each other and work to improve outcomes and provide reasons for consumers to choose them over their competitors. The data provides the impetus for change and serves as a catalyst to motivate stakeholders to address readmission rates and develop strategies to improve the rate of readmissions.

The Cost of Readmissions. The cost of high readmission rates is another trigger for conducting this IR, since hospitals with high readmission rates are subject to a financial penalty of up to 3% by Medicare (Wood, 2015). Publicly reported financial information related to readmissions was reviewed and served to illustrate the direct monetary effect that high readmission rates have on a health system. Financial penalties affect the health system negatively and the sustainability of the organization may be in question. This trigger has led to many efforts across the country to improve readmission rates (Long et al., 2017).

Preliminary Review of Studies

A preliminary review of the literature included: 11 studies and six guides/resources from the Institute for Healthcare Improvement (IHI), related to readmission reduction efforts. The 11 studies included: one systematic review of randomized controlled trials; three randomized controlled trials; one controlled trial without randomization; three cohort studies; and three descriptive studies. Preliminary review was also conducted of the Centers for Disease Control and Prevention (CDC) website and the Agency for Healthcare Research and Quality (AHRQ) website. The literature was rich with readmission reduction insight and connections to the financial impact of readmission rates. Because of the significant financial impact of readmissions, health systems continually work to reduce readmission rates using specific protocols, programs, and collaborations. Literature was evaluated using the Melnyk framework and revealed the need to consider readmission reduction efforts that involved support beyond the four walls of the hospital. Major points of discussion in the literature related to readmission reduction included: tools that stratify the risk of readmission, causes of readmission, and efforts to reduce readmissions. This information was valuable to understanding the problem, its significance, and the purpose of the scholarly project.

Supplemental Evidence

Supplemental evidence is information related to readmissions that was obtained from other sources apart from the database search (Toronto & Remington, 2020). This evidence provided guidance regarding readmission reduction efforts. The IHI reported that the rate of avoidable rehospitalizations can be reduced by improving discharge planning, coordinating care during transitions between settings, and improving support for patients (IHI, 2021). The IHI

further offered two resources to address the problem of readmissions and four How-to Guides on improving the transition from the hospital to other levels of care, with tips to avoid readmissions.

Further information was obtained from the Centers for Disease Control and Prevention (CDC) website, where specific diseases and readmission rates are posted, and hundreds of additional resources are available to assist in managing diseases and conditions (2021). The Agency for Healthcare Research and Quality (2019) also provided a database and software tools to support the analyses of readmission rates and access to articles related to interventions designed to reduce readmissions. Coordination between different levels of care and enlisting appropriate resources was emphasized by these agencies and supported the IR.

The supplemental evidence pointed to partnerships as crucial to preventing readmissions (Institute for Healthcare Improvement, 2021). Coordination of care, discharge planning, and transitions between levels of care were addressed throughout the resources, and tips to avoiding readmissions consistently recommended involving community resources and partners to prevent readmissions.

Standards

No published guidelines and standards were found in the National Guidelines Clearinghouse for health systems to specifically address readmissions in a prescriptive manner (Agency for Healthcare Research and Quality [AHRQ], 2019).

Review of Studies

Tools to Identify Risk. The literature search indicated that it is necessary to identify which patients are most at risk of readmission to the hospital to effectively develop strategies to prevent readmissions (Shadmi et al., 2020). Without predictive tools to identify patients at risk of readmission it is very difficult for the clinician to determine the level of risk (Sieck et al., 2019).

Most health systems have developed tools to identify patients at high risk of readmission, but the tools must be validated to show their usefulness and accuracy in identifying the correct patients to target interventions. According to Banoff et al. (2016), predicting the risk of readmission can be complex, and utilizing a valid tool to quantify the risk of readmission establishes an objective method by which to prioritize discharge planning efforts in the hospital setting. Effective discharge planning consequently reduces the risk of readmission.

Many tools incorporate medical history, diagnoses, and socioeconomic factors however, they may rely on data that is not available until after discharge (Banoff et al., 2016). Current condition and assessment information of the patient would ideally be factored into the risk stratification to identify those most in need of discharge planning efforts. Real-time data is essential to allow for the most useful assessment of risk and discharge planning. The tool must be available and useful to all personnel involved in the care of the patient; appropriate resources will then be utilized to achieve the best outcomes. Also, as stated by Burke (2017), best practice is to identify factors that place patients at risk of readmission and address those modifiable factors to prevent readmissions. Accurate identification of those at risk of readmission will allow personnel to target specific problems and develop interventions for the individual that is at risk.

Causes of Readmissions. The literature revealed that there are several common causes of readmission which are important to understand if readmissions are to be prevented (Nelson & Pulley, 2015). They included a lack of coordination of care or poor transition of care between settings; inadequate preparation and education of patients to effectively manage conditions and prevent hospitalization; and the inadequate management of complex medical needs (Glans et al., 2020). Faulty communication and premature hospital discharge may also be factors that contribute to readmissions (Takahashi et al., 2020). If the risk factors that lead to readmission are

not well understood and addressed, interventions to prevent readmission will not be successful (Reid et al., 2021).

Other significant reasons for high readmission rates are social determinants of health (SDOH), or the social, economic, and political factors and processes which can influence health outcomes (Knighton et al., 2018). Essentially, these are factors occurring outside of the hospital setting which affect the risk of hospital readmission (Reid et al., 2021). The SDOH include: economic stability, social and community context, neighborhood and environment, healthcare, and education. These factors often affect the individual's health behaviors and access to healthcare, which influences the risk for readmission (Knighton et al., 2018). It is imperative to recognize SDOH whenever discussing the causes of poor outcomes related to readmissions.

More specific examples of SDOH include: poverty, material deprivation, social isolation, homelessness, health literacy, poor self-care behaviors, lower quality of healthcare, and lack of transportation (Takahashi et al., 2020). Clearly, these are major influences on a patient's overall health and must be addressed to significantly impact patient outcomes related to hospital readmissions. The persistent nature of SDOH must also be considered as they lead to consistent overutilization of healthcare services. SDOH that lead to readmissions are not easily remedied and, therefore, long-term planning is necessary to mitigate the negative consequences of the SDOH.

Efforts to Reduce Readmissions. Efforts to reduce readmissions are frequently referenced in the literature and many are ongoing since there are significant financial consequences associated with high readmission rates (Leavitt et al., 2020). It is vital to review what efforts have already been made to reduce readmissions, to understand which interventions have the most potential for success in the future. Several studies described transitional care

efforts made by hospital staff to decrease readmissions; some of those have been shown to improve rates but there are often significant barriers that impede progress (Taylor et al., 2020). Other efforts have been made by CBOs to address patient specific needs such as meal delivery (Martin, 2018). Programs that address medication problems are also described in the literature and support the need for pharmacist involvement with patients after discharge (Weiyi et al., 2017). Despite healthcare's focus on readmission rates and efforts to improve them for several years, there is still a need for more improvement (Wilcox et al., 2018). The literature has indicated that causes of readmissions have been identified but that efforts by health systems to address these causes have fallen short (Takahashi et al., 2020). Initiatives that provide support for patients after discharge from the hospital must be developed by health systems seeking to improve readmission rates and avoid penalties.

Interventions that have been implemented to improve readmission rates should be carefully studied and used to support the call for action to mitigate the risk. Partnerships were revealed in the literature as a means of readmission reductions. Several partnerships were discussed, including partnerships with CBOs involving clinical staff such as pharmacists (Heaton et al., 2019; Weiyi et al., 2017); partnerships with CBOs/academic institutions where students follow-up individually with patients after discharge (Coppa et al., 2018; Welch et al., 2018); and partnerships with CBOs involving non-clinical staff, such as meal delivery programs, Agency on Aging, and faith-based organizations (Brewster et al., 2018; Heitkam et al., 2019; Martin, 2018). The agencies which have made efforts to address SDOH and specific needs of those at high risk of readmission are essential to efforts of health systems, and partnerships can lead to more collaboration and success (Persey, 2018). There is evidence that investing in community-based services and partnerships can lead to a reduction in readmission rates (Wilcox et al., 2018).

High readmission rates have been a persistent problem for many years causing added cost and burden to individuals and communities across the country (Wood, 2015). The need to develop effective strategies "beyond the four walls" to reduce readmission rates is obvious as the cost of readmissions to health systems is substantial; financial penalties to health systems with high readmission rates add to the urgency of the problem.

Problem Statement

High readmission rates at many non-profit community-based health systems cause added cost and burden to patients, healthcare systems, and communities. Without effective strategies to reduce these rates, the cost of healthcare will continue to rise, adding to the burden on healthcare systems, communities, and individuals. Readmission reduction strategies that include developing partnerships "beyond the four walls" need to be considered to reduce readmission rates.

Purpose

The purpose of this IR is to raise awareness for partnerships that impact 30-day readmission rates in non-profit community-based health systems. A raised awareness will seek to increase collaboration between non-profit community-based health systems and CBOs to devise policy and practice guidelines.

Review Questions

For non-profit community-based hospitals will partnerships with CBOs reduce 30-day readmission rates, when compared to non-profit community-based hospitals who do not partner with CBOs?

The following questions guided and focused the IR efforts:

1. What are the causes of hospital readmissions in non-profit community-based healthcare systems?

2. Which CBO partnerships with the non-profit community-based healthcare systems showed the most probability of success in preventing 30-day readmissions?
3. Which tools are most effective in non-profit community-based healthcare systems at identifying patients at risk of hospital readmissions?

Goals of the Project

The goals of the scholarly work were to:

1. provide a systematic IR of the research related to partnerships between CBOs and non-profit community-based health systems and the impact on readmissions.
2. investigate the feasibility and advantages of partnerships between non-profit community-based health systems and CBOs.
3. make recommendations for future research and program development, based on evidence, and to inform practice and policies.

Inclusion and Exclusion Criteria

The inclusion criteria stipulated that publications from 2016 to 2021 would be included in the IR to ensure that the information and research was not outdated. In addition to this inclusion criteria, the search was also limited to research participants who are 18 years of age and older. Only reports in full text and written in English were included. Both qualitative and quantitative studies were included as well.

Excluded from the IR were publications dated before January 1, 2016, as well as studies related to people younger than 18 years of age. Also, publications that were in a foreign language were excluded (see Table 1).

Table 1

Inclusion and Exclusion Criteria

Inclusion	Exclusion
Publication from 2016-2021	Publications prior to 2016
Adult patient population 18 years and older	Pediatric population less than 18 years of age
Peer reviewed, gray literature (newspaper articles, conference papers, guidelines, etc.)	Non-research articles (editorials, fact sheets, etc.)
Articles written in the English language	Articles written in non-English languages
Full-text articles	Abstracts only

Conceptual Framework (Cooper, Whittemore & Knafl)

The Harris Cooper (1998) conceptual framework for IRs was used to complete the IR. This approach offers a substantive strategy for a rigorous and complete review of literature. Kirkevold (1997) describes integrative research as a strategy of great significance which advances nursing science and practice. Toronto and Remington (2020) further explain that the IR enables a reviewer to gain a more holistic understanding of a specific phenomenon. For these reasons, the doctor of nursing practice (DNP) supports the integrative approach to research. The collection, analysis, and integration of research findings will improve the awareness and understanding of readmissions and will inform nursing practice to reduce readmissions. This approach will display the scholarship of the DNP and demonstrate the importance of looking "beyond the four walls" to reduce readmissions in non-profit community-based health systems.

The IR framework was based on the five-stage process of Whittemore and Knafl (2005). The following stages were brought to fruition: problem identification stage, literature search stage, data evaluation stage, data analysis stage, and presentation (Toronto & Remington, 2020).

Problem Identification Stage

The first step in any review is the identification of a problem and the purpose of the review (Whittemore & Knafl, 2005). Whittemore and Knafl (2005) developed the methodology

of the IR which is based on Cooper's (1998) original IR methodology. Rigor was maintained by following the framework processes closely to decrease bias and inaccuracy. There are many types of reviews that have been utilized by healthcare professionals to inform their practice as the evidence for healthcare practice is very complex (Toronto & Remington, 2020). The IR is well suited to the science of nursing due to its broad nature and, therefore, the IR methodology was utilized with the topic of readmissions.

This integrative review was intended to inform healthcare systems on strategies to reduce readmissions. Research has shown that readmissions are costly but also preventable (Lin, 2015; Nelson & Pulley, 2015; Takahashi, 2020; Wood, 2015). The IR will raise awareness and gather support for initiatives to address the problem of readmissions.

Literature Search Stage

After problem identification the literature search stage was conducted. This is also known as data collection and is essential to ensure the rigor of the review (Whittemore & Knafl, 2005). If the literature search is incomplete and the final database is inadequate, overall results will be inaccurate. Search terminology must be consistent to ensure that all eligible studies are included; therefore, recommended methods of searching included computerized databases, journal hand searching, networking and the search of research registries (Conn et al., 2003). The project utilized a table of evidence to display data from all studies chosen for IR. The table included study purpose, sample information, methods, study results, level of evidence, study limitations, and usefulness to support a change (see Appendix A).

Data Evaluation Stage

During this stage critical judgements are made about the data by extracting methodological features of primary sources (Whittemore & Knafl, 2005). Primary sources are

those studies that directly assess the effect of interventions, whereas secondary sources are those that have interpreted or analyzed primary sources and offered further insight (Prada-Ramallal et al., 2018). Data evaluation is very complex in the IR method since diverse primary sources such as case studies, cross-sectional studies, grounded theory, and instrument development designs are included (Whittemore & Knafl, 2005). It requires appraisal of the literature when the research designs are very different, and the sampling frame is very broad. It is also more difficult to define quality when primary sources are not empirical. The most appropriate approach is to evaluate the authenticity, informational value, methodological quality, and representativeness of available primary sources (Kirkevold, 1997). If the report is theoretical in nature, evaluation techniques used with theory analysis should also be considered.

Quality criteria instruments can be helpful when determining the quality of primary sources (Whittemore & Knafl, 2005). The PRISMA checklist served as a quality criteria instrument to evaluate the quality of sources (see Appendix E) (Moher et al., 2009). Another quality instrument used for the IR was the Melnyk Pyramid, which allowed for the scoring of reports from I to VII based on level of evidence (see Appendix D) (Melnyk & Fineout-Overholt, 2015). Level one includes systematic reviews of controlled trials; level two is a randomized controlled trial; level three is a controlled trial (non-randomized); level four is a cohort or case-controlled study; level five is a systematic review of descriptive studies; level six is a single descriptive study; and level seven is expert opinion.

Data Analysis Stage

During this stage the data is ordered, coded, categorized, and summarized to form a coherent conclusion and interpretation (Whittemore & Knafl, 2005). This stage has the most potential for error and is one of the most difficult portions of the IR. Categories, distinguishing

patterns, themes, relationships, and variations are identified and displayed for the reader which clarifies the nature of the studies included in the IR. Both qualitative and quantitative studies were included in the IR if they addressed readmission rates, which presented a challenge when ordering, coding, and categorizing the results of the different types of research. Therefore, a constant comparison method, which is used for qualitative designs, was used for data analysis during this IR.

Constant comparison method. This method allows the reviewer to convert data into categories and lead to the identification of patterns, relationships, and themes (Whittemore & Knafl, 2005). Extracted data is compared item by item and groupings are compared to facilitate further analysis and synthesis. For this IR iterative comparisons were continually made between data sources to allow for constant comparison. The approach was systematic and consisted of data reduction, data display, data comparison, and conclusion drawing and verification (Whittemore & Knafl, 2005).

Data reduction. The two phases involved in data reduction are developing a data classification system and extracting/coding the data (Whittemore & Knafl, 2005). During the first phase the best overall classification system is chosen for the data gathered, which may include many different types of methodology (Whittemore & Knafl, 2005). Subgroups need to be identified, and then primary sources are divided into the subgroups. For this IR data was divided based on level of evidence and then sample characteristics and elements of the interventions chosen were considered as subgroups (Melnyk & Fineout-Overholt, 2015).

The second phase involved in data reduction is extracting and coding data (Whittemore & Knafl, 2005). This is when the overall classification system for managing the data is developed. This process is a key element to ensuring rigor and providing organization of the data. The

articles chosen for this IR were entered into a matrix that identified the following aspects of each study for comparison: study purpose, sample characteristics, methods, study results, level of evidence, and study limitations (see Appendix A).

Data display. The data extracted and coded was then displayed in a flow chart to serve as a visual representation of the literature gathered and used in the IR. The flow chart helped the reviewer visualize and understand the relationships between key findings and concepts from the literature.

Data comparison. This step involved the process of studying the data displays and commenting on patterns, themes, and relationships identified (Whittemore & Knafl, 2005). Several strategies of data comparison were used, and rigorous analytic activities led to the drawing of conclusions, which is the final phase of the constant comparison method (Toronto & Remington, 2020).

Conclusion drawing and verification. This is the last stage of data analysis and involves higher levels of generalization (Whittemore & Knafl, 2005). Conclusions must be verified with the primary source data and caution must be exercised to avoid the exclusion of evidence. After each subgroup was analyzed, a final analysis was conducted during which all the conclusions were integrated into one conclusion about the topic of interest. A record of all data analysis decisions and impressions was kept to facilitate analytical honesty and transparency. The entire process of data analysis was documented including: ideas, hunches, and hypotheses that may be relevant to the data. After the analysis of each subcategory was completed for this IR conclusions were drawn and compared to the original data. New information related to readmissions was subsequently developed from the subcategories.

Presentation of Results

During this stage, conclusions of the IR are reported in a diagram or table (Whittemore & Knafl, 2005). The details of the presentation and evidence support conclusions and contribute to a new understanding of the topic. The limitations of the review are also clearly stated and implications for practice, research, and policy are emphasized. For this project there were three types of presentations of results: tables, a flowchart, and concept maps. The tables contain information in narrative form and describe information from the literature search, which supports the conclusions (see Appendix A). The systematic approach used to conduct the literature search is depicted in a flowchart (see Appendix F). Concept maps were also included to depict types of partnerships found in the IR (see Figure 1) and the themes identified by the IR (see Figure 2).

Figure 1.

Flowchart of Themes Related to Partnerships

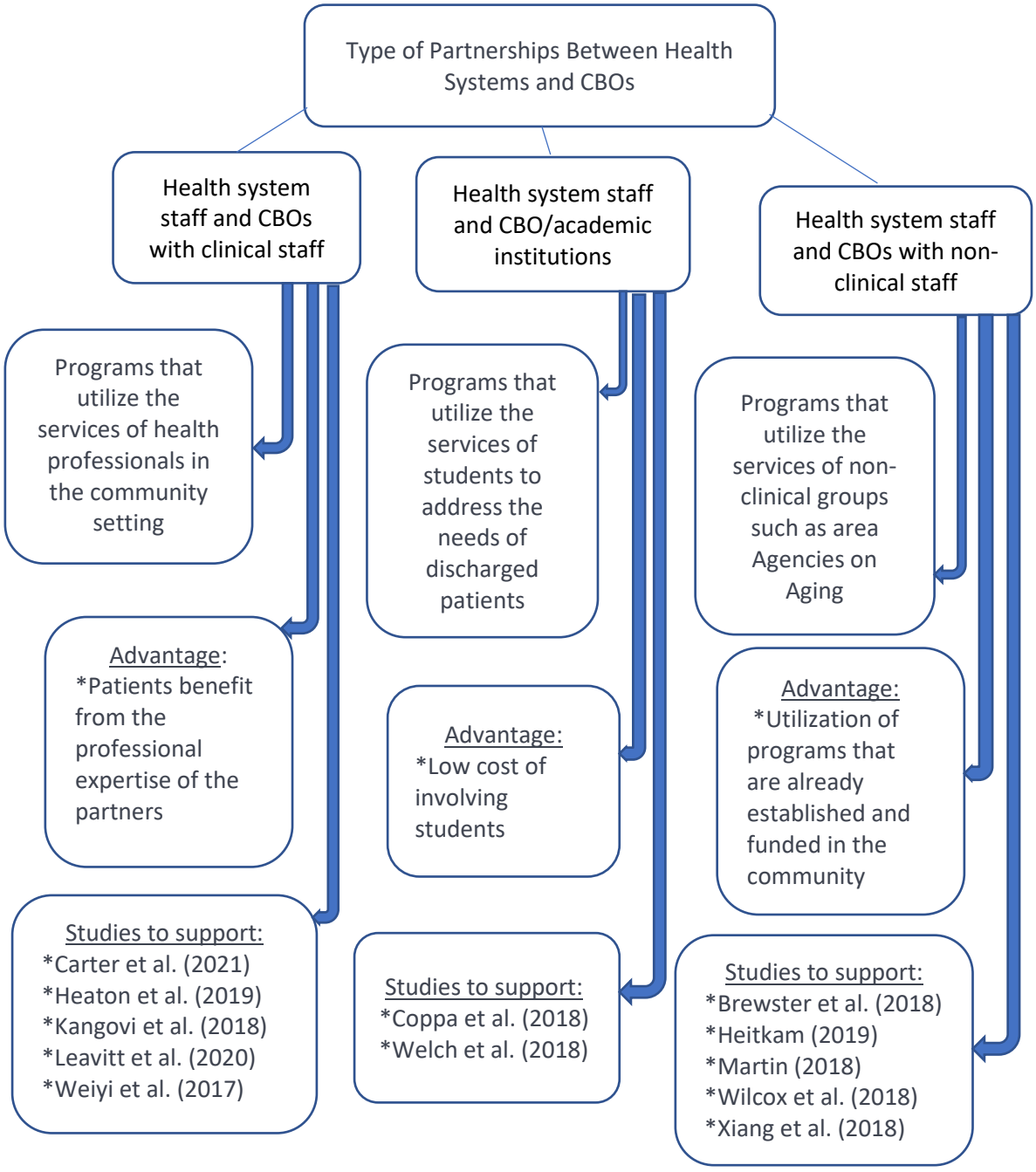
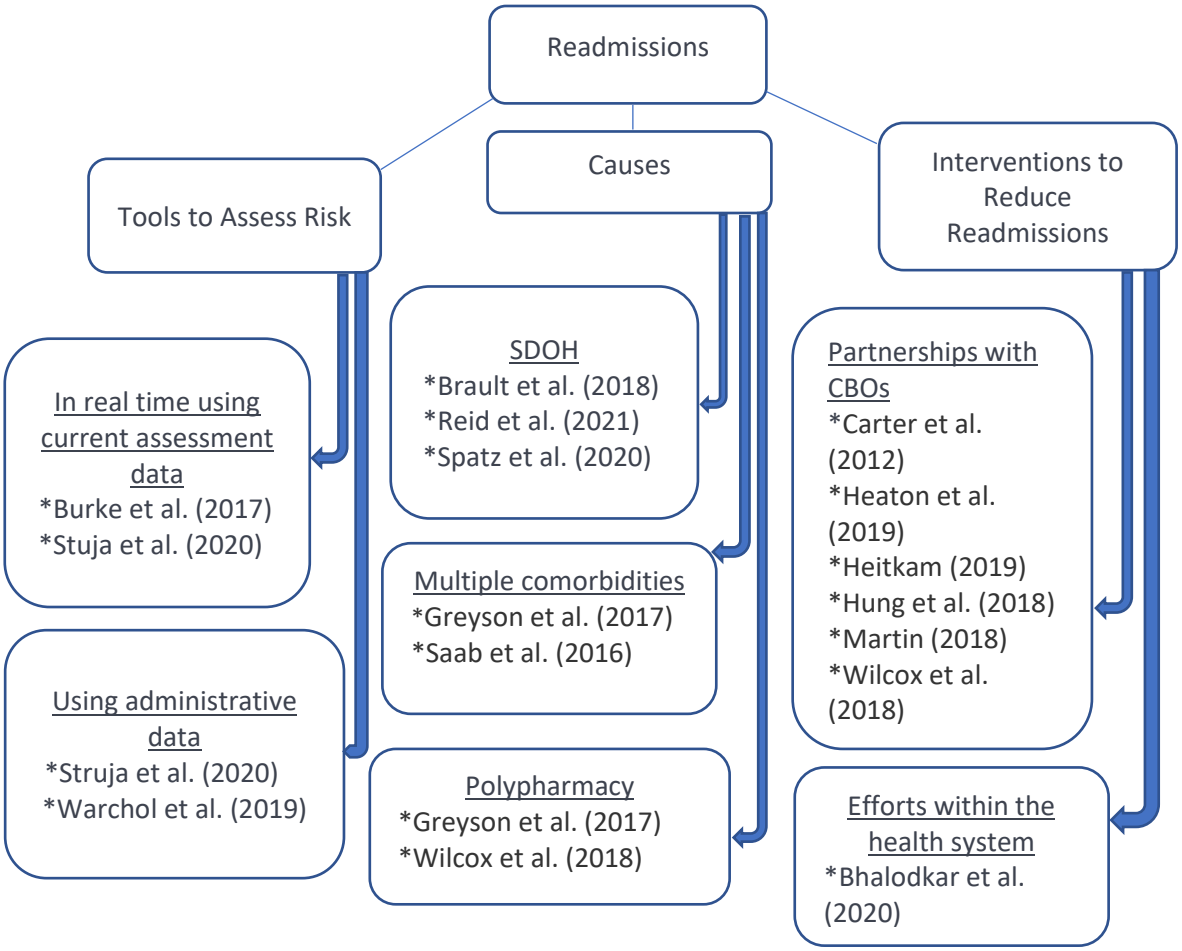


Figure 2.

Flowcharts of Themes Related to Readmissions



SECTION TWO: SEARCH STRATEGIES

Search Organization and Reporting Strategies

IRs are described by Whittemore and Knafl (2005) as contributing to a deeper understanding of the subject by including experimental and non-experimental research in a review and addressing many purposes simultaneously. Consideration must be given to the way that different types of studies are combined and integrated to form conclusions when they use different research methods. The need for all types of literature reviews has become more evident as the need for evidence-based practice (EBP) initiatives has also increased. For these reasons the literature search must be comprehensive, organized, and clearly reported (Toronto & Remington, 2020).

Search Strategy

A comprehensive literature search should include at least two search methods to ensure the adequacy of the database and accurate results (Whittemore & Knafl, 2005). The reviewer utilized several databases as well as ancestry searching, and a professional librarian was consulted to support the search of literature to ensure effective strategies and terminology were utilized. The time period from 2016 to 2021 was chosen to ensure that studies were current. Articles prior to this time period were located during the ancestry search, however they were not included due to lack of relevance to the topic. Databases searched included CINAHL, Cochrane Library, Proquest Nursing and Allied Health Database, and Ovid Medline. Search of gray literature was also conducted as part of the search method, to prevent publication bias (Toronto & Remington, 2020). Gray literature was obtained by utilizing search engines Google, Google Scholar, guidelines, and government resources. All articles chosen were published in English.

Key words/phrases for the search included: preventing, reducing, hospital readmissions, community, partnership, and adults.

The literature search resulted in 758 articles for review. Five additional articles were located using other sources and 216 duplicates were removed leaving 547 articles for review. All articles were screened and further refined by age of subjects (18 years and older) and availability of reports in English and full text (see Appendix F). Ninety-five articles remained and further review of titles and abstracts led to the selection of 25 articles as shown in the literature matrix (see Appendix A).

Melnyk Pyramid. The Melnyk level of evidence (LOE) Pyramid was utilized by the reviewer to evaluate the strength of each study (see Appendix D) (Melnyk & Fineout-Overholt, 2015). Studies are ranked from level I to VII. Level one includes meta-analyses of randomized controlled trials, while level two includes individual randomized controlled trials. Level three represents controlled trials without randomization and level four includes case controlled and cohort studies. Level five includes systematic reviews of descriptive and qualitative studies and level six is a single descriptive or qualitative study. The final level is level seven which is comprised of expert opinion. The LOE utilized for this project included levels II-VI. No reports were excluded from this project based on their level, since studies from various levels can offer valuable insight from different perspectives on the subject of the IR.

The literature chosen for review included: six level two studies, three level three studies, seven level four studies, two level five studies, and seven level six studies. This translates to 36% of studies that were levels two and three which indicates a moderate strength of evidence. The most significant findings that emerged were related to the types of partnerships between CBOs and healthcare systems that led to improvement in readmission rates. These included:

partnerships between health systems and CBOs with clinical staff; partnerships between health systems and CBOs/academic staff; and partnerships between health systems and CBOs with non-clinical staff (see Figure 1). Besides the strategies to reduce readmissions, the importance of identifying a patient's level of readmission risk and causes of readmissions were identified as major themes related to readmissions (see Figure 2).

PRISMA statement. PRISMA is a set of guidelines that offers standardized terminology to ensure the quality of systematic reviews, meta-analyses, and IRs (see Appendix E) (Moher et al., 2009). PRISMA supported the framework and facilitated complete and transparent reporting of the IR (Page et al., 2021). It consists of a 27-item checklist and a flow diagram which illustrates the information flow through the phases of an IR. In addition to being helpful with reporting of IRs, PRISMA can be used for critical appraisal, although it is not a quality assessment instrument. For this IR, the PRISMA statement served as a basis for sound development and formation of the IR.

Terminology

Documentation of the search process and terms used to conduct the search is essential to ensure rigor and transparency (Toronto & Remington, 2020). This IR was guided by the review questions and search terms were adjusted as needed to produce relevant results. The search terms included: hospital readmissions, adults, community, partnerships, and preventing. Boolean phrases were utilized as needed to expand or limit the search of literature based upon inclusion and exclusion criteria. Examples of Boolean phrases are *OR*, *AND*, and *NOT.* Consultation with a research librarian further refined the search and ensured the inclusion of relevant articles.

Limitations

It is important to note limitations in an IR and several limitations were noted for this IR. Only studies published in English were included, therefore relevant evidence published in other languages may have been excluded. Another limitation was the use of a single reviewer who was also the primary researcher, which meant there was no opportunity to ensure accuracy. Consequently, the risk of bias was introduced, and internal validity may have been affected.

Another potential limitation relates to the search strategy. It is possible that the terms used in the search led to missing other studies about readmissions that utilized different terms. Also, the volume of literature produced in the literature search related to readmissions was extensive, and it was difficult for the reviewer to choose the most appropriate articles for inclusion in the review. Finally, the PRISMA guidelines and Melnyk Pyramid were both used to screen articles for eligibility, however, these systems did not always match. The reviewer, therefore, included some studies regardless of rating on the Melnyk Pyramid.

SECTION THREE: MANAGING THE COLLECTED DATA

This integrative review involved a systematic and comprehensive search that resulted in a total of 25 articles for review. The 25 articles chosen for the IR varied by design and ranged from level two to level six on Melnyk's Pyramid of Evidence (Melnyk & Fineout-Overholt, 2015). Six of the studies were randomized controlled trials (Bhalodkar et al., 2020; Carter et al., 2021; Heaton et al., 2019; Kangovi et al., 2018; Leavitt et al., 2020; Taylor et al., 2020); three studies were quasi-experimental (Coppa et al., 2018; Martin, 2018; Rhodes et al., 2021); seven studies were cohort studies (Brewster et al., 2018; Burke et al., 2017; Greysen et al., 2017; Saab et al., 2016; Struja et al., 2020; Weiyi et al., 2017; Welch et al., 2018); two studies were systematic reviews of qualitative literature (Brault et al., 2018; Hilts et al., 2021); and seven studies were

single qualitative or descriptive studies (Heitkam, 2019; Hung et al., 2018; Reid et al., 2021; Spatz et al., 2020; Warchol et al., 2019; Wilcox et al., 2018; and Xiang et al., 2018). These articles supported the problem statement that addressed the issue of high readmission rates at non-profit community-based health systems. The articles also support partnerships between non-profit community-based health systems and CBOs to lower readmission rates.

PRISMA Flow Diagram

Data analysis was presented utilizing PRISMA. PRISMA supports a flow diagram methodology (see Appendix F). The flow diagram starts with the number of articles identified from the initial search. 758 articles were identified for review. Five additional articles were located using other sources and 216 duplicates were removed which left 547 articles for review. All articles were screened and further refined by age of subjects (18 years and older) and availability of reports in English and full text (see Appendix F). Ninety-five articles remained and further review of titles and abstracts led to the selection of 25 articles as shown in the literature matrix (see Appendix A).

Partnerships

Management and analysis of the collected data revealed that partnerships between non-profit community-based health systems and CBOs can have a positive impact on readmission rates. Twelve of the articles directly addressed partnerships between health systems and CBOs and described the different types of CBOs that led to lower readmission rates. Brewster et al. (2018) described a retrospective cross-sectional study that was designed to determine if partnerships between Area Agencies on Aging (AAA) and health systems would lower readmission rates. The results showed that readmission rates were lower in the counties that had these partnerships. Carter et al. (2021) conducted a randomized controlled trial that demonstrated

30-day readmission rates would be reduced by pairing at risk patients with community health workers. In a quasi-experimental level study, Coppa et al. (2018) found that a partnership between clinicians and academic team members decreased readmissions.

Another randomized controlled trial conducted by Heaton et al. (2019) demonstrated that a medication therapy management program led by community pharmacists could reduce readmission rates by 9%. This supports the value of partnerships between health systems and community personnel. Heitkam (2019) utilized a single descriptive study to determine the effectiveness of a program in which one nurse from a faith community was assigned to one patient to support post-discharge. This program reduced readmission rates by 79% (Heitkam, 2019). Hilts et al. (2021) performed a systematic review of peer-reviewed literature and determined that partnerships between hospitals and CBOs hold promise for improving readmission rates.

Hung et al. (2018) conducted a qualitative study to determine how successful a community-based transition program was on reducing readmission rates and identified several key factors that determine the success of a program including: intervention characteristics, organizational characteristics, implementation process, patient characteristics, implementation on measures, and implementation on outcomes. Kangovi et al. (2018) used a randomized controlled trial to assess the IMPACT program that addressed SDOH. The program was found to reduce readmission rates. Leavitt et al. (2020) also conducted a randomized controlled trial and found that a home health nurse heart failure intervention reduced readmission rates by 29%.

Martin (2018) used a controlled trail without randomization to determine if a specialized meal delivery program could reduce 30-day readmission rates when combined with a community transition program. The results were promising as the intervention group had a 10.3%

readmission rate compared to the 16.6% baseline rate. Taylor et al. (2020) conducted a randomized controlled prospective study to determine the effectiveness of a telephone based transitional care management program in rural areas. This intervention did not lead to lower readmission rates but offered insight into the barriers found in rural areas. Weiyi et al. (2017) conducted a prospective cohort study to ascertain the effectiveness of pharmacist led discharge services and found that readmission rates decreased by 28%. This supports the potential benefits of partnerships with community pharmacists.

Welch et al. (2018) conducted a cohort prospective study to determine if a transition care model using a health coach from a local university would reduce readmission rates. The results were very promising as rates were reduced by 72%. Wilcox et al. (2018) found in a retrospective observation study that COMPASS, a community program, reduced readmission rates from 21% to 16.2%. Xiang et al. (2018) evaluated the Bridge Model experience using a qualitative study and found that organization culture, and organization champions increase the likelihood of success of the model and partnerships.

Bholadkar et al. (2020) addressed the need for intense individualized follow-up to prevent readmissions in a randomized controlled trial. The results showed that a specialized interdisciplinary program could reduce readmission rates by 12%. Through a randomized controlled trial, Carter et al. (2021) also showed that readmission rates improved when patients were individually paired with community health workers. Heitkam (2019) also supported the effectiveness of a program that provided individualized care to patient at risk of readmission after discharge from the hospital. Partnerships are key to preventing readmissions, as illustrated by these several studies.

Risk Stratification Tools

The importance of risk stratification tools was discussed by Burke et al. (2017) in a retrospective cohort study in which the HOSPITAL tool was found to be very predictive of a patient's risk of readmission. Struja et al. (2020) also evaluated specific readmission risk scoring tools using a prospective cohort study. Results revealed that the best predictive abilities were seen with the HOSPITAL model, the PARA model, and the score from Tsui et al. (which was not named) (Struja et al., 2020). Warchol et al. (2019) used a descriptive study to determine if data from the EMR could be used to identify at risk patients. In Warchol et al.'s study, participants recognized a link between social factors and readmission risk. Rhodes et al. (2021) employed a quasi-experimental design to demonstrate that screening for SDOH and addressing social service needs will help to reduce readmission rates.

Causes of Readmissions

In a sequential explanatory mixed methods approach, Brault et al. (2018) sought to understand how social factors in one's environment affect readmission rates. The findings revealed that SDOH are causes for readmissions and that partnerships between healthcare organizations and social service organizations lead to lower hospital readmission rates (Brault et al., 2018). Greyson et al. (2017) employed a multi-site mixed methods study that revealed the main cause of readmissions is difficulty managing complex healthcare needs and inadequate follow-up after discharge. Reid et al. (2021) conducted a population based, descriptive study to determine that community and lack of social support is a cause of readmissions. Similarly, Spatz et al. (2020) used a single descriptive design to determine that community factors and social support affect readmission risk of residents. The link between homelessness (one SDOH) and readmissions was explored by Saab et al. (2016) in a 1:1 matched cohort study. These studies

demonstrated that readmissions are caused by complex medical needs and SDOH and must be addressed to reduce the rates of readmissions.

SECTION FOUR: QUALITY APPRAISAL

After the collection and organization of data, quality appraisal must take place. Quality appraisal is a systematic examination to evaluate the value, relevance, and reliability of literature (Toronto & Remington, 2020). Inclusion and exclusion criteria were applied, and relevance of literature related to the IR guided the inclusion and exclusion of the literature throughout the process. The literature included was relevant to the review question which guided the IR process. To maintain rigor, the strengths and weaknesses of all included studies were considered related to the methodology.

Quality appraisal also included ethical approval. The project researcher and project Chair for this IR completed the Collaborative Institutional Training Initiative (CITI) training to ensure understanding of the importance of protecting human subjects in research (see Appendix B). Institutional approval was obtained and approved through the Liberty University Institutional Review Board (IRB) to conduct the IR as the project does not include human subjects and is exempt (see Appendix C).

According to the description supplied by Toronto and Remington (2020), the data search for the IR was complete. The search was considered complete when the search strategy had been modified by adding relevant terms based on citations relevant to the topic; new searches contained no new and unique results; and searches on the high-profile authors of the topic did not reveal new citations.

Sources of Bias

The quality of studies increases when bias is minimized, since bias affects the believability and trustworthiness of a review (Toronto & Remington, 2020). Bias can occur at any stage of the research process, and it is imperative to examine each study for potential sources of bias. For example, publication bias can occur when studies are not published because the results are not positive or noteworthy. For this reason, a search for gray literature was conducted for this IR and included unpublished works such as dissertations, conference papers, and policy papers (Toronto & Remington, 2020). A professional librarian was consulted and provided guidance for the search for gray literature. The search for gray literature was conducted in PROQUEST and yielded 44 results. None of those articles were chosen for this IR due to not meeting the criteria; however, this process demonstrated that the search for literature was thorough and robust to increase the rigor of the IR.

Internal Validity

Internal validity is a focus on bias or the believability of findings (Toronto & Remington, 2020). If bias is present in the individual studies chosen for the IR, the IR itself will also be biased and internal validity will be compromised. For this IR each study was chosen after considering the type of research used, limitations of the research, and potential bias which could affect the validity of each study.

Study selection for this IR was based on the problem statement and clinical questions. The studies chosen did not directly and completely address the problem statement; therefore, the reviewer drew conclusions based upon the clinical questions. Those conclusions led to the development of themes: partnerships that reduce readmissions, tools to aid in risk stratification, and causes of readmissions.

Appraisal Tools

There is no ideal method for quality appraisal of literature for an IR (Toronto & Remington, 2020). Quality appraisal of literature is widely inconsistent. There is no gold standard regarding the appraisal tool for an IR; however, there are several that are commonly used in nursing. The Melnyk LOE pyramid was used for this review (see Appendix D). This facilitated the organization of literature into categories. The quality appraisal is displayed in a literature matrix that identifies the components of the literature chosen for this IR (see Appendix A).

Reporting Guidelines

Toronto and Remington (2020) note that quality and transparency are increased through Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline reporting in an IR. The PRISMA 27-item checklist was utilized to critically appraise literature for this IR (see Appendix E). The PRISMA statement acknowledges the iterative process of the IR and that the reporting and conducting of systematic reviews are intertwined (Moher et al., 2009). The systematic approach used to conduct the literature search is depicted in a flowchart (see Appendix F).

Applicability of Results

The IR contributes to the understanding of problems and development of solutions when the applicability of results is recognized (Whittemore & Knafl, 2005). The themes identified in the studies chosen for this IR were analysed to determine the applicability of the results. The major themes identified were: tools to identify risk of readmission, the causes of readmission, and interventions to reduce readmission rates, as they were very prevalent in the literature. These themes are applicable to current health system efforts and strategies to improve readmission

rates. Different types of CBOs were also identified as potential partners with health systems, to address causes of readmissions and improve readmission rates.

Readmission Risk Stratification

The IR results supported the assertion that accurate tools must be used to assess a patient's risk of readmission, so risk factors can be addressed (Banoff et al., 2016). Prediction of readmission risk can be based on general past medical history; however, this information is often not specific enough to develop a true picture of the risk present (Glans et al., 2020). Also, many of the current tools use administrative data that is not available until after discharge. These tools do not use real-time data such as nursing assessments during the current hospital stay to predict readmission risk.

It is crucial, therefore, to utilize a tool that can predict readmission risk by using patient specific clinical data that is not simply based on diagnoses. The Rothman Index score is an example of this type of tool as it utilizes real-time information during a hospital stay to assess a patient's readiness for discharge (Banoff et al., 2016). The score is developed independent of the diagnoses and uses assessment factors of the patient during their hospital stay to predict risk of readmission. This tool was found to have potential as an adjunct assessment tool to help teams predict the risk of readmission. Another readmission risk assessment tool is HOSPITAL, which uses seven different variables associated with risk of readmissions, including: recent lab results, number of hospital admissions in the last 12 months, urgency of admission, length of stay, medical procedures, discharge from oncology unit, and complex imaging studies (Burke et al., 2017).

The IR also showed that SDOH are important to consider when assessing risk for readmission. Hatef et al. (2019) studied the association between social factors and risk of

readmission. When combined with EMR data this information can be powerful (Hatef et al., 2019). Tools such as The Better Outcomes by Optimizing Safe Transitions (BOOST) 8 P's instrument have also been studied and found by researchers to aid in predicting readmission risk (Sieck et al., 2019). Similarly, Reid et al. (2021) found that using a community lens to contextualize risk for readmission has the potential to help discharge planners and hospitals improve readmission rates. This shows the importance of utilizing accurate tools that incorporate SDOH to predict the risk of readmissions.

Causes of Readmissions

Besides the studies about tools to predict the risk of readmission, five studies in the IR described causes of readmission (Brault et al., 2018; Greyson et al., 2017; Reid et al., 2021; Saab et al., 2016; Spatz et al, 2020). Notable causes of readmission included patient specific characteristics such as co-morbidities, polypharmacy, and complex medical needs, as well as SDOH (Saab et al., 2016). The connection between health outcomes and SDOH is also widely recognized and has become even more prominent in recent years. Spatz et al. (2020) describe the causative effect of psychosocial factors on readmissions and the importance of addressing those factors. Links between social environment and utilization of healthcare services including hospital readmissions was studied by Brault et al. (2018) and offers insight into the factors which lead to readmissions. Recognizing the causes of readmissions can help healthcare personnel target solutions and initiate more effective interventions to address those causes.

Strategies to Reduce Readmissions

Successful strategies to reduce readmissions were described by Wilcox et al. (2018) in a retrospective analysis of Medicare beneficiaries in New England in which community partnerships led to a decrease in 30-day readmission rates. The partnerships were between CBOs

and health systems that supported programs to address specific risk factors; risk stratification occurred in the hospital setting and referrals were made to appropriate programs in the community that could address the individual needs of patients. This included transportation needs, housekeeping, and other social needs of patients. The study confirmed that community partnerships can improve patient outcomes (Wilcox et al., 2018).

Other studies demonstrated that intense follow-up by healthcare professionals during the transition from hospital to home can make a positive difference (Bhadodkar et al., 2020; Weiyi et al., 2017). Bhadodkar et al. (2020) described an approach by nurses, social workers, physician specialists, and nutritionists who focused on patient care and follow-up after discharge. This study reinforced the need for continual support after hospital discharge to avoid readmission to the hospital. Weiyi et al. (2017) also described a transitional care program involving pharmacists in the community which helped to prevent readmissions. Collaboration between the team of pharmacists and patients was effective and demonstrated that community partnerships can improve outcomes including readmission rates. The success of these programs emphasized the importance of deliberate follow-up with those most at risk of readmission.

The results of the IR highlight strategies that have been utilized by some health systems to reduce readmissions. Partnerships between health systems and community agencies have been found to improve patient outcomes including hospital readmission rates and these partnerships warrant more attention and exploration (Wilcox et al., 2018). Partnerships with community-based organizations that can address specific risk factors of patients should be implemented during the transition between the hospital and home setting to provide the most appropriate support for the patient (Carter et al., 2021; Heaton et al., 2019; Hung et al., 2018). Partnerships can also include faith communities and volunteers that work to keep patients out of the hospital

with individualized care and follow-up, as described by Heitkam (2019). Also noteworthy is the study conducted by Martin (2018) in which a specialized meal delivery program was found to have a positive effect on 30-day readmission rates when combined with a community-based care transition program.

SECTION FIVE: DATA ANALYSIS AND SYNTHESIS

According to Whittemore and Knafl (2005) data analysis involves unbiased interpretation of primary sources and innovative synthesis of the evidence. The analysis stages included data reduction, display and comparison. The following themes were identified: types of partnerships between health systems and CBOs; readmission risk stratification; and causes of readmissions. This analysis and synthesis provided a springboard to address readmissions.

Data Analysis Methods

The analysis starts by acknowledging the goal of the IR which is to create a better understanding of the topic (Toronto & Remington, 2020). The analysis is not simply a reporting of the information collected in the data, but rather the creating of a new concept or framework from which to understand the phenomenon of interest. The analysis of data helps to create the synthesis and increase the knowledge of the subject. Constant comparison is used to examine the data and identify themes that will enhance and build a larger knowledge base in support of the subject matter.

A data matrix is extremely helpful in providing structure to the presentation of results (Toronto & Remington, 2020). For this IR a matrix was used to display the citation, study purpose, sample characteristics, methods, study results, level of evidence, study limitations, and use of evidence to support a change (see Appendix A). A thorough analysis of study characteristics was completed to identify themes across the literature. Common themes prevalent

in the literature were identified, namely types of partnerships that can serve as potential partners with health systems, to address causes of readmissions and improve readmission rates (see Figure 1). Other themes identified across the literature included: tools that provide readmission risk stratification, causes of readmissions, and interventions to reduce readmission rates (see Figure 2).

Synthesis

The synthesis of diverse sources is a creative and complex process that leads to a new model, framework, or conception and a greater understanding of the topic (Toronto & Remington, 2020). The purpose and review questions for this IR affected the synthesis of results and led to the presentation of IR results through the use of themes. For this IR, the themes identified were types of partnerships used to reduce readmissions; assessment of readmission risk; the causes of readmissions; and interventions to reduce readmissions. The strength of the research evidence is moderate, as 36% of studies were rated as level two or three on Melnyk's Level of Evidence Pyramid (see Appendix A). The results of this IR support the need for partnerships between health systems and CBOs. The results further revealed that there are no standards related to reducing readmissions, which further supports the value of this IR.

Types of Partnerships

The constant comparison method used in the IR involves clustering and making contrasts/comparisons which enhances the identification of patterns and themes (Toronto & Remington, 2020). In this case, further analysis of the data led to the identification of different types of partnerships between health systems and CBOs, all of which have shown some success in reducing readmissions. It is, therefore, important to recognize the value in the different types of partnerships that have been used to help patients after hospital discharge. This information can

be helpful when deciding where to focus efforts, how to formulate strategies, and how to prioritize initiatives within the health system. Each community-based health system may find the benefits of different types of partnerships more appealing based on their own characteristics, resources, and the community in which they reside. The three main types of partnerships that emerged from the IR were partnerships between health system staff and CBOs with clinical staff; partnerships between health system staff and CBO/academic institutions in the community; and partnerships between health system staff and CBOs with non-clinical staff.

Partnerships Between Health Systems and CBOs with Clinical Staff. These partnerships exist between health system employees and other medical personnel who are not employed by the health system. Heaton et al. (2019) described the partnership between multiple health systems and community-based pharmacists in which medication management was provided to patients by the community-based pharmacists. The result of this level two randomized controlled trial was a 9% reduction in 30-day readmission rates (Heaton et al., 2019). Similarly, Weiyi et al. (2017) demonstrated in a level four cohort study that pharmacist led discharge services could decrease 30-day readmission by 28% by initiating a transition of care (TOC) service. The pharmacists focused on patient education, resolving medication problems, and facilitating access to post-discharge appointments (Weiyi et al., 2017). High risk patients clearly benefited from these interventions, and readmission rates in the health system improved.

Another study involved community health workers (CHW) participating in the Individualized Management for Patient-Centered Targets (IMPACT) program with low-income patients (Kangovi et al., 2018). The health conditions as well as SDOH of participants were addressed and results demonstrated that the intervention group had a lower risk of readmission

than the control group (Kangovi et al., 2018). Carter et al. (2021) also found that 30-day readmission rates were reduced by pairing at-risk patients with CHW who have been trained in health coaching and can assist with SDOH needs. Motivational interviewing, goal-setting, and psychosocial support was given to those at risk of readmission which illustrates that partnerships with these CHWs can be very beneficial to individuals, health systems, and communities. Home health nurse interventions were also found to positively affect those with heart failure as the intervention group had a 13% less chance of readmission when compared to the control group (Leavitt et al., 2020). These findings show that partnerships between health systems and home health agencies would clearly benefit all involved.

Partnerships Between Health Systems and CBO/Academic Institutions. The IR also revealed that partnerships between health systems and academic institutions in the community can lead to improvement in readmissions rates. This was discussed by Coppa et al. (2018). They described a program in which complex patients were assisted by academic team members, specifically nurse practitioner (NP) students in a Federally Qualified Health Center (FQHC) organization (Coppa et al., 2018). The NPs actually made home visits to the patients most at risk due to chronic conditions, lack of access to healthcare, and multiple hospitalizations in the past year. This was a quasi-experimental retrospective study (level three) and did not have a comparison group; however, the program produced a 34.9% decrease in readmissions for the patients involved in the study.

Another academic service partnership that was shown to be successful in reducing readmissions was described by Welch et al. (2018). This level four cohort prospective study focused on patients with chronic conditions and offered them care from students as health coaches. The setting was a rural health facility and participants often had limited access to

healthcare post discharge. A health coach intern from the local academic institution provided patients in the program with assistance related to medication reconciliation, written discharge plans, patient education, and self-care educational materials. Emphasis was also placed on follow-up appointments and tests, and post-discharge services setup. Coordination of care improved as the patient's primary care provider received a discharge summary from the health coach and other team members. If needed, arrangements were made to address SDOH through agencies like Meals-on Wheels, or with mental health and/or religious groups that could provide home visits. The readmission rate decreased by 72% and demonstrated the benefits of partnerships with academic groups (Welch et al., 2018).

Partnerships Between Health System Staff and CBOs With Non-Clinical Staff. Five studies included in the IR pointed toward partnerships with non-clinical CBOs that could significantly decrease a patient's risk of readmission (Brewster et al., 2018; Heitkam, 2019; Martin, 2018; Wilcox et al., 2018; Xiang et al., 2018). Brewster et al. (2018) focused on partnerships between health organizations and Area Agencies on Aging (AAA) that addressed the SDOH which place a patient at risk of decline and hospital readmission. Addressing these risk factors led to lower hospitalization rates and other negative outcomes. Similarly, Martin (2018) studied a group of patients discharged from the hospital to determine if a specialized meal delivery program could reduce 30-day readmission rates. Indeed, this level three controlled trail (without randomization) led to a decrease in readmission rates from 16.6% to 10.3%. Faith communities can also be important partners in reducing readmissions, as demonstrated by Heitkam (2019). In Heitkam's study, individualized care was given to each patient by a nurse trained in faith community nursing for one year after discharge. This was a level six descriptive

study with a small sample size; however, there was a significant decrease in 30-day readmission rates, which shows the potential for these types of programs.

Highly structured programs and services also show great promise for reducing readmission rates. One example is the Community Passport 2 Care (ComPass) program as described by Wilcox et al. (2018) which facilitated communication across care settings, individualized care, and addressed the SDOH that place patients at risk of readmission. This program is a tight partnership between the healthcare system and the community. It begins with assessment of a patient's risk of readmission while they are in the hospital and has the potential to decrease readmission rates significantly (Wilcox et al., 2018). In another study by Xiang et al. (2018), participants were asked to discuss the Bridge Model experience, which also focuses on addressing the social needs of patients after discharge. This was a level six qualitative study and revealed that participants viewed the program positively, but barriers still exist to implementation. Financial barriers, staff turnover, and the culture of the organizations involved were cited as important to the success of the program. Nevertheless, the Bridge program is an important partnership between health systems and CBOs to improve readmission rates and warrants further study.

Readmission Risk Stratification

The IR results support the assertion that accurate tools must be used to assess a patient's risk of readmission so risk factors can accurately be addressed (Banoff et al., 2016). Prediction of readmission risk can be based on general past medical history, administrative data, or real-time data. The most accurate tools available should be utilized to aid in reducing the risk of readmission.

Tools based on past medical history. Some readmission risk stratification tools base results on past medical history, although this information is often not specific enough to develop a true picture of the risk present (Glans et al., 2020). Tools such as LACE, as described by Struja et al. (2020), include data regarding length of stay, comorbidities, and the acuity of the admission to predict the risk of readmission and offer guidance to discharge planners. Other predictive models which incorporate real-time data, however, were found to have higher potential to predict readmissions.

Tools based on administrative data. Many tools use administrative data that is not available until after discharge to predict the risk of readmission. These tools have disadvantages but offer some insight into risk for readmission. Warchol et al. (2019) conducted a descriptive study that explored the usefulness of data from the electronic medical record (EMR) to identify a patient's risk and reduce readmission rates. Participants agreed that risk predictive models based on information in the EMR were useful in predicting readmission risk, and that social factors should be considered as well.

Tools based on real-time data. Stuja et al. (2020) discussed six different readmission risk scores for inpatients; one of the most predictive tools was the HOSPITAL model. Burke et al. (2017) also discussed the HOSPITAL model, which incorporates seven different variables associated with risk of readmissions, including recent lab results, number of hospital admissions in the last 12 months, urgency of admission, length of stay, medical procedures, discharge from oncology unit, and complex imaging studies. The more comprehensive models are most predictive by incorporating current patient information and assessment data with past medical history and administrative data.

The Rothman Index score is another example of a tool that incorporates real-time information during a hospital stay to assess a patient's readiness for discharge (Banoff et al., 2016). The score is developed independent of the diagnoses and uses assessment factors of the patient during their hospital stay to predict risk of readmission. This tool was found to have potential as an adjunct assessment tool to help teams predict the risk of readmission.

Causes of Readmissions

Besides the studies about tools used to predict the risk of readmission, five studies used in the IR described possible causes of readmission (Brault et al., 2018; Greyson et al., 2017; Reid et al., 2021; Saab et al., 2016; Spatz et al., 2020). Notable causes of readmission included patient specific characteristics such as complex medical needs, as well as SDOH (Saab et al., 2016).

Complex medical needs. Saab et al. (2016) discussed the fact that complex medical needs can lead to readmissions and that individuals with multiple chronic diseases or communicable diseases are more likely to be rehospitalized. Greyson et al. (2017) also discussed the individual's risk of readmission due to difficulty with self-care, chronic conditions, or inadequate guidance after discharge. Wilcox et al. (2018) also discussed the causes of readmissions and a program designed to help address those causes. In their level six descriptive study Wilcox et al. acknowledged that those with complex medical needs are at higher risk of readmission. The COMPASS program provides interventions based on the specific needs of the individual.

SDOH. In addition to complex medical needs, the IR revealed that SDOH are important to consider when assessing risk for readmission. Spatz et al. (2020) described the causative effect of psychosocial factors on readmissions and the importance of addressing those factors. Links between social environment and utilization of healthcare services including hospital

readmissions was studied by Brault et al. (2018) who offered insight into the factors that lead to readmissions. Recognizing the causes of readmissions can help healthcare personnel target solutions and initiate more effective interventions to address those causes.

Reid et al. (2021) found that using a community lens to contextualize risk for readmission has the potential to help discharge planners and hospitals improve readmission rates. This shows the importance of considering SDOH as potential causes of readmissions.

Strategies to Reduce Readmissions

The results of the IR also highlight strategies that have been utilized by some health systems to reduce readmissions. Partnerships between health systems and community agencies have been found to improve patient outcomes including hospital readmission rates and these partnerships warrant more attention and exploration (Wilcox et al., 2018). Partnerships with community-based organizations that can address specific risk factors of patients should be implemented during the transition between the hospital and home setting to provide the most appropriate support for the patient (Carter et al., 2012; Heaton et al., 2019; Hung et al., 2018). Partnerships can also include faith communities and volunteers that work to keep patients out of the hospital with individualized care and follow-up as described by Heitkam (2019). Also noteworthy is the study conducted by Martin (2018) in which a specialized meal delivery program was found to have a positive effect on 30-day readmission rates when combined with a community-based care transition program.

SECTION SIX: DISCUSSION

The purpose of this IR was to define community partnerships in support of readmission reduction. Unplanned 30-day readmissions cost Americans approximately $26 billion annually, and up to 36.2% of early readmissions within seven days are preventable (Wood, 2015). There

are also significant financial penalties for healthcare institutions with high readmission rates. Hospitals have been penalized about $3 billion for readmissions so far which provides even more incentive for health systems to reduce readmission rates (Wadhera et al., 2021). For these reasons the IR was very timely and necessary to conduct to address gaps in knowledge and practice for healthcare systems.

This IR synthesized information to answer the following questions:

1. What are the causes of hospital readmissions in non-profit community-based healthcare systems?
2. Which CBO partnerships with the non-profit community-based healthcare systems showed the most probability of success in preventing 30-day readmissions?
3. Which tools are most effective in non-profit community-based healthcare systems at identifying patients at risk of hospital readmissions?

Partnerships to Prevent Readmissions

The IR revealed that the partnerships which showed the most probability of success were those that addressed the SDOH of patients who were most at risk of readmission (Brewster et al., 2018; Kangovi et al., 2018; Martin, 2018; Welch et al., 2018; Wilcox et al, 2018). Partnerships which led to substantial reduction in readmission rates focused on providing individualized care and follow-up to individuals to prevent readmission (Carter et al., 2021; Coppa et al., 2018; Heitkam, 2019). These programs assigned one worker to one patient for follow-up and saw substantial improvements in readmission rates. Partnerships that addressed specific risk factors for readmission, such as polypharmacy, led to improved readmission rates as well (Heaton et al., 2019). Barriers to implementation and sustainability must also be addressed to maintain the success of many of these programs (Xiang et al., 2018). Overall studies show that many

partnerships between health systems and CBOs have led to significant improvement in readmission rates (Brewster et al., 2018; Carter et al., 2021; Coppa et al., 2018; Heaton et al., 2019; Heitkam, 2019; Hilts et al., 2021; Hunt et al., 2018).

Tools to Assess Risk

It was evident from the results of the IR that tools to assess the risk of readmission must incorporate real-time data to most accurately predict the risk (Burke et al., 2017; Rhodes et al., 2021; Struja et al., 2020; Warchol et al., 2019). Tools that only use administrative data such as past hospitalization and diagnoses are not as effective at predicting risk (Struja et al., 2020). The evidence shows that readmission rates must be addressed by using accurate tools to predict risk of readmission which incorporates the specific causes of readmission (Struja et al., 2020; Saab et al., 2016). The tools/predictive models that were identified as most accurate from the studies were the HOSPITAL tool, PARA, and the tool developed by Tsui et al. (which is unnamed) (Struja et al., 2020).

Causes of Readmissions

The IR revealed that the most significant causes of readmission include complex medical needs and SDOH (Brault et al., 2018; Coppa et al., 2018; Greyson et al., 2017; Heaton et al., 2019; Reid et al., 2021; Saab et al., 2016; Spatz et al., 2020).

Complex Medical Needs

Greyson et al. (2017) gathered feedback in a level four case controlled study from patients who had been readmitted and found that they had difficulty in self-care and resolving issues after discharge. Their complex medical needs in combination with a lack of support had led to readmission. Coppa et al. (2018) discussed a level three quasi-experimental study with patients who had complex medical needs and were more at risk of readmission due to their

complex needs. The interventions discussed in the study decreased the risk of readmission and validated the idea that complex needs are often a cause for readmissions (Coppa et al., 2018). Heaton et al. (2019) describe the additional readmission risk of patients with conditions that require multiple medications. A lack of support and understanding about the medications caused their readmission and the involvement of pharmacists after discharge can prevent readmissions.

SDOH

The need for additional support for self-care was evident in the literature and relates to SDOH which can be addressed by CBOs to reduce the risk of readmissions. Brault et al. (2018) found that communities with high readmission rates had less social support and organizations available to address SDOH. Reid et al. (2021) found that the community of residence is associated with risk of readmissions and is important to consider with discharge planning efforts. A lack of support from the community related to socioeconomic factors may mean patients cannot receive the follow-up care they need. Spatz et al. (2020) also found in a level six descriptive study that readmission risk is influenced by the community in which a person lives. Individuals who live in communities with less social support and fewer services have higher readmission rates. In a level four cohort study, Saab et al. (2016) compared the readmission rates of those experiencing homelessness to those of a control group; they found that homeless individuals have four times the rate of readmissions than the control group. Homelessness and other SDOH are clearly linked to an increase in risk of readmissions.

Implications for Practice

The IR revealed sufficient evidence to change practice in support of partnerships between non-profit community-based health systems and CBOs to reduce hospital readmissions. Administrators and clinicians must consider the causes of readmissions and utilize accurate tools

to assess patients for their risk of readmission. Interventions must target the specific needs of individuals at risk for readmission and address the factors that place them at risk, especially SDOH.

The IR further shows that health systems should include partnerships in planning efforts. Many different types of CBOs can support the partnerships needed with non-profit community-based health systems to improve readmission rates. Health systems should explore possibilities with clinically focused CBOs, such as local pharmacies, as well as academic institutions, in addition to non-clinical CBOs that primarily focus on addressing SDOH. In so doing non-profit community-based health systems will address the significant costs associated with readmissions and the negative impact of readmissions on communities and individuals.

This IR revealed several points of discussion to disseminate:

1) The need for partnerships between health systems and CBOs is evident and will help to address SDOH and prevent hospitalizations (Takahashi et al., 2020).
2) The use of tools to assess a patient's risk for readmission is essential and will lead to more targeted interventions (Banoff et al., 2016).
3) Understanding the causes of readmissions is crucial and will allow for effective strategic planning to prevent readmissions (Nelson & Pulley, 2015).
4) Acknowledging the social determinants of health (SDOH) will aid efforts to prevent further hospitalizations (Heitkam, 2019).
5) Partnerships between health systems and different types of CBOs can reduce readmissions.

Future Work

Additional research is needed to explore the impact of partnerships between CBOs and the health systems in support of readmission reduction; as well as to determine the most effective way to organize and approach these partnerships. Funding and sustainability of the partnerships are also topics for further research. Devising policies in support of partnerships with CBOs needs to be studied further. To better understand the impact of partnerships on the financial implication of readmissions, it is necessary to involve key stakeholders, such as insurance providers and clients themselves.

Dissemination

Dissemination of results is the final step of the scholarly project. Change will only occur with effective dissemination of information (Melnyk & Fineout-Overholt, 2015). Without effective communication the information gathered and synthesized will not provide the maximum value to stakeholders. An effective dissemination plan will ensure the results are communicated clearly to a targeted audience which will help to develop new perspectives on the topic and encourage further studies (Toronto & Remington, 2020). Dissemination of results will raise awareness of key issues and lead to further consideration of the topic (McLain, 2018). A measurement of success of dissemination efforts is also vital.

The framework for dissemination of findings will be based on a research dissemination kit developed by the University of Virginia (University of Regina, 2011). Considerations include: the findings, objectives, audience, user needs, dissemination methods, organizational resources, and potential barriers.

Findings

The findings of the IR will be disseminated and include: types of partnerships which can reduce readmissions; assessment of readmission risk; the causes of readmissions; and interventions to reduce readmissions.

Objectives

The goal of dissemination of the IR findings must align with the IR (University of Regina, 2011). Objectives include describing the impact of CBO partnerships with health systems on reduction of 30-day readmission rates. The IR will inform community members and health systems about the benefits of partnerships between health systems and CBOs.

Audience

There are many stakeholders with whom to address this pressing topic and they include: health systems, CBOs, and patients who are impacted by hospital readmissions. These stakeholders are interested in decreasing readmission rates and will want to hear the results of this IR (Wilcox et al., 2018). Health system administrators, board members, and finance managers are also key stakeholders as they must concern themselves with the negative financial consequences of readmissions, as explained by Nelson and Pulley (2015). Administrators and board members are directly responsible for the sustainability of the organization and quality outcomes that affect patients and the financial state of the health system. Managers, social workers, discharge planners, providers, and direct care clinicians are additional stakeholders since they all work diligently to achieve the best outcomes for their patients. Finally, those employed or volunteering in CBOs to care for others in the community are stakeholders, as they strive to improve living conditions and the health of the community by addressing the SDOH that affect their members (Bensken et al., 2021). Communication and dissemination of IR

findings must be tailored to the audience to provide the most effective transfer of information (University of Regina, 2011).

User Needs

Tailoring dissemination efforts to user needs is essential (University of Regina, 2011). Some users may require very detailed explanation of IR background, methodology, and findings, while others may only need a cursory overview or abstract of the IR. Communication efforts will be tailored to meet the needs of health system personnel and CBOs. The method of dissemination must keep the attention of the audience and provide value and meaning to users; users must see the relevance and value of the IR and be compelled to seek more information on the topic (Toronto & Remington, 2020).

Methods

Methods to be used to disseminate information from this IR include: presentations at conferences, publications, and poster presentations. Specifically, the results will be disseminated through a poster presentation at annual nursing symposiums and conferences; by submitting for a journal publication; and through poster presentations at local CBO meetings. These presentations will enable the results of the IR to be shared with key stakeholders in the non-profit community-based health system, and individuals interested in reducing readmission rates.

Resources

After identifying the objectives, audience, and methods to be used with dissemination, the skills and resources required for the dissemination need to be identified (University of Regina, 2011). Funding sources must be secured and appropriately acknowledged, and sponsor reporting requirements must be fulfilled.

Barriers

Barriers to successful dissemination of IR findings must be identified and effectively addressed (University of Regina, 2011). Lack of support from the health system is one possible barrier that may arise since there are many competing priorities in a non-profit community-based health system. Lack of support from CBOs could also be a barrier, as well as the potential cost that may be associated with partnerships between the health system and CBOs. Strategies to overcome barriers will be developed to effectively disseminate the results of this IR.

Conclusion

High readmission rates are of great concern in healthcare today. Non-profit community-based health systems are particularly interested considering the significant financial impact of readmissions and penalties associated with them. This IR has revealed that there is value in partnerships between non-profit community-based health systems and CBOs when working to improve readmission rates (Wilcox et al., 2018). The types of partnerships that have been shown to reduce readmissions include: partnerships between health system staff and CBOs with clinical staff; partnerships between health system staff and CBO/academic institutions in the community; and partnerships between health system staff and CBOs with non-clinical staff. The review also supports the need to address risk stratification and causes of readmissions (Hatef et al., 2019). Robust methods for conducting the IR were used to ensure reliable synthesis of information and analysis of data; and findings from this IR will be disseminated to key stakeholders to address gaps in knowledge and practice. Given the current state of healthcare and the mandate to reduce readmissions it is imperative to develop strategies to address readmission rates. This IR will offer insight for further improvement efforts, answering the call to action, and supporting the delivery of safe, quality, individualized patient care inside and outside the four walls of the hospital and health system.

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Weiyi, N., Colayco, D., Hashimoto, J., Komoto, K., Gowda, C., Wearda, B., & McCombs, J. (2017). Impact of a pharmacy-based transitional care program on hospital readmissions. *American Journal of Managed Care, 23*(3), 170–176.

Whittemore, R. & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing, 52*(5), 546-553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

Wilcox, D., McCauley, P., Delaney, C. (2018). Evaluation of a hospital: Community partnership to reduce 30-day readmissions. *Professional Case Management, 23,* 327-341. https://doi.org/10.1097/NCM.0000000000000311

Wood, S. L. (2015). A home visit checklist to reduce rehospitalizations. *Home Healthcare*

Now, 33(8), 431–436. https://doi-org.ezproxy.liberty.edu/10.1097/NHH.0000000000000280

Xiang, X., Robinson-Lane, S. G., Rosenberg, W., & Alvarez, R. (2018). Implementing and sustaining evidence-based practice in health care: The Bridge Model experience. *Journal of Gerontological Social Work, 61*(3), 280–294. https://doi.org/10.1080/01634372.2018.1445154

TABLE 1

Table 1

Inclusion and Exclusion Criteria

Inclusion	Exclusion
Publication from 2016-2021	Publications prior to 2016
Adult patient population 18 years and older	Pediatric population less than 18 years of age
Peer reviewed, gray literature (newspaper articles, conference papers, guidelines, etc.)	Non-research articles (editorials, fact sheets, etc.)
Articles written in the English language	Articles written in non-English languages
Full-text articles	Abstracts only
Healthcare Institutions	Non-healthcare institutions

Appendix A

Results Matrix

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
Bhalodkar, A., Sonmez, H., Lesser, M., Leung, T., Ziskovich, K., Inlall, D., Murray-Bachmann, R., Krymskaya, M., & Poretsky, L. (2020). The effects of a comprehensive multidisciplinary outpatient diabetes program on hospital readmission rates in patients with diabetes:	To determine if a specialized interdisciplinary program (including a diabetes educator, nurse practitioner, social worker, nutritionist, and endocrinologist, as needed) will improve rehospitalization	192 patients were included and 49% were in the control group vs. 51% in the intervention group; patients were 18 years and older, had primary or secondary diabetes, and	Randomized controlled prospective study	30-day readmission rates were 7 % for the intervention group compared to 19% for the control group	Level 2 – randomized controlled trial (Melnyk & Fineout-Overholt, 2015)	Single participating institution; small subject numbers; lack of data from other hospitals; inability to determine which aspects of the program led to success.	Yes, this would be used to implement a multi-disciplinary approach to reduce readmission rates. An inter-disciplinary approach was effective in

A randomized controlled prospective study in endocrine practice. *Official Journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists, 26*(1) 1331–1336. https://doi-org.ezproxy.liberty.edu/10.4158/EP-2020-0261	rates for diabetic patients.	were on Medicare services.					this study and helps to address the individual needs of the patients.
Brault, M. A., Brewster, A. L., Bradley, E. H., Keene, D., Tan, A. X., & Curry, L. A. (2018). Links between social environment and health care utilization and costs. *Journal of Gerontological Social Work, 61*(2), 203–220. https://doi.org/10.1080/01634372.2018.1433737	To understand how social factors in the environment affect healthcare utilization	245 key informants from health or social services organizations were interviewed; quantitative methods identified high performing communities	Sequential explanatory mixed methods approach with deviant case sampling	Partnerships between healthcare organizations and social service organizations lead to lower hospital readmission rates	Level 5 – systematic review of descriptive and qualitative studies	Criteria used to select high and low performing communities can be influenced by many factors besides social environment; sample size was small (16 communities); indicator data is non-concurrent with interviews	Yes, this information could be used to support more partnerships between health systems and community-based organizations

Brewster, A. L., Kunkel, S., Straker, J., & Curry, L. A. (2018). Cross-sectoral partnerships by area agencies on aging: Associations with health care use and spending. *Health Affairs, 37*(1), 15–21. https://doi.org/10.1377/hlthaff.2017.1346	To determine if partnerships between Area Agencies on Aging (AAA) and health systems would lead to lower hospital readmission rates and nursing home admissions	1,916 counties covered by 368 AAAs were eligible for the study; data were available for 1,110-1,560 counties, containing 48-53% of the U.S. population	Retrospect-ive cross-sectional study using a survey of AAA and measure of avoidable healthcare use and spending for older adults	Counties with informal relationships between AAA and health organizations had lower hospitalizatio n rates than counties that did not have those information relationships	Level 4 -case control or cohort study	This was a cross-sectional study, therefore, causation could not be inferred; missing data for certain variables may limit generaliz-ability; measurement errors in reporting partnerships via the AAA survey may have affected results.	Yes, this information supports the need for partnerships between health systems and community-based organization to prevent readmissions.
Burke, R.E., Schnipper, J. L., Williams, M.V., Robinson, E. J., Vasilevskis, E. E., Kripalani, S., Metlay, J. P., Fletcher, G. S., Auerbach, A. D. & Donzé, J.D. (2017). The HOSPITAL score predicts potentially preventable 30-day readmissions in	To determine how useful the HOSPITAL tool is at identifying patients that are at high risk of readmission in select conditions that are targeted by the Hospital Readmission Reduction Program (HRRP)	9181 patients from six geographic-ally diverse medical centers;	Retrospect-ive cohort study	Among the patients involved the readmission rate was 13.6% and the HOSPITAL score is useful in identifying those at risk of	Level 4 – case control or cohort study	The HOSPITAL score was not studied with surgical patients; the HOSPITAL tool was not compared to the CMS risk-adjustment model	Yes, this study would be useful in supporting a change and implementin g the use of a tool such as the HOSPITAL tool to assess a patient's

conditions targeted by the hospital readmissions reduction program. *Medical Care, 55* (3), 285-290. doi: 10.1097/MLR.0000000000000665.				readmission in a variety of settings			risk of readmission
Carter, J., Hassan, S., Walton, A., Yu, L., Donelan, K., & Thorndike, A. N. (2021). Effect of community health workers on 30-day hospital readmissions in an accountable care organization population. *JAMA Network Open, 4*(5). https://doi.org/10.1001/jamanetworkopen.2021.10936	To determine if 30-day readmission rates will be reduced by pairing at-risk patients with community health workers	573 adult patients admitted to six internal medicine units in Boston, Massachusetts; mean age was 70.1; 48.4% were women;	Randomized controlled trial	Participants in the intervention group were less likely to be readmitted to the hospital within 30 days	Level 2– randomized controlled trial	Researchers may not have been able to identify all encounters outside of their hospital system; healthy user bias may have led to underrepresentation of those with complex medical needs; inability to stratify participants based on destination after discharge (home vs. rehab facility)	Yes, this study shows on a preliminary basis that community health workers can help to reduce 30-day readmission rates.
Coppa, D., Winchester, S. & Roberts, M.	To describe the effect of a	82 clinically complex	Quasi-experimental	There was a 34.9 %	Level 3 – Quasi-	No attempt was made to	Yes, this study

(2018). Home-based nurse practitioners demonstrate reductions in rehospitalizations and emergency department visits in a clinically complex patient population through an academic-clinical partnership. *Journal of the American Association of Nurse Practitioners, 30*, 335-343. https://doi.org/10.1097/JXX.0000000000000060	partnership between clinicians and academic team members on readmission rates	patients; 27% men, 73% women; average age: 60.6;	retrospective pre/post study design	decrease in readmissions after the implementa-tion of the program, compared to the one year prior to the inception of the program.	experimental level	establish a comparison group (which would have added to the strength of the study; data collection on diagnosis was limited as it was hand entered by the NPs (not based on insurance claims); reliability and validity data was not obtained.	supports the building of partnerships between health systems and academic institutions in the community to improve readmission rates.
Greysen, S. R., Harrison, J. D., Kripalani, S., Vasilevskis, E., Robinson, E., Metlay, J., Schnipper, J. L., Meltzer, D., Sehgal, N., Ruhnke, G. W., Williams, M. V., & Auerbach, A. D. (2017). Understanding patient-centered readmission factors: a multi-site, mixed-	To describe patient-reported and caregiver-reported factors contributing to hospital readmissions	1066 general medical patients readmitted within 30 days at 12 U.S. hospitals; multiple choice survey also included open ended questions; cross	A multi-site mixed methods study	Patients readmitted within 30 days reported understandin g their discharge plans; however, they also had notable difficulties in self-care and inadequate	Level 4 – Case controlled study	The sample was not a perfect representation of the general pool; the generalizability of the findings is limited; the patient perspectives may be subject to positive bias since they were	Yes, this study supports the need to further explore the factors that may affect risk for readmission.

methods study. *BMJ Quality & Safety, 26*(1), 33. http://dx.doi.org.ezproxy.liberty.edu/10.1136/bmjqs-2015-004570		sectional national study		guidance for resolving issues after discharge.		conducted in the hospital setting after readmission	
Heaton, P. C., Frede, S., Kordahi, A., Lowery, L., Moorhead, B., Kirby, J., Kunze, N., & Luder, H. (2019). Improving care transitions through medication therapy management: A community partnership to reduce readmissions in multiple health-systems. *Journal of the American Pharmacists Association: JAPhA, 59*(3), 319–328. https://doi.org/10.1016/j.japh.2019.01.005	To assess the effectiveness of a medication therapy management program led by pharmacists (and involving multiple health systems and community pharmacies) designed to reduce 30-day readmission rates	400 patients discharged from a participating hospital with pneumonia, diabetes, myocardial infarction, congestive heart failure or chronic obstructive pulmonary disease	Randomized clinical trial	Patients in the intervention group were 9% less likely to be readmitted to the hospital within 30 days	Level 2-randomized controlled trials	Control group readmission rates could have been affected by other readmission reduction initiatives compared with the intervention group, which had younger patients who might not qualify for other transition-of-care programs; intervention group had a higher proportion of Medicaid patients, who tend to have	Yes, this study supports the need for health systems to partner with pharmacists in the community to reduce hospital readmissions

						more complex socioeconomic issues that can affect care.	
Heitkam, R. (2019). Reducing hospital readmissions through faith community nursing. *Nursing Management (Springhouse), 50*(8), 26–30. doi: 10.1097/01.NUMA.0000575312.84044.dc.	To determine the effectiveness of a program where one nurse is assigned to one patient to support them in their healthcare journey for one year.	16 patients with history of frequent hospitalizations were enrolled.	Nurses were trained in faith community nursing and accepted a one year assignment with one patient to provide spiritual and emotional support and improve outcomes. Results/outcomes from previous year were compared to the year during which the program was implemented.	30-day readmissions decreased by 79%.	Level 6 – Single descriptive study (Melnyk & Fineout-Overholt, 2015)	Very small sample size; the program relies heavily on volunteers.	Yes, this study will be used to support the concept of care management for reducing readmissions, even though the sample size is small and it is not a high level of evidence. It does show that personal attention to patients can have very positive results.
Hilts, K., Yeager, V., Gibson, P., Halverson, P., Blackburn, J.	To identify examples of hospital-	37 articles published between 2008	Systematic review of peer-	Partnerships between hospitals and	Level 5 – systematic review of	The review only contains peer-reviewed	Yes, this systematic review

(2021). Hospital partnerships for population health: A systematic review of the literature. *Journal of Healthcare Management, 66*, 170-198. https://doi.org/10.1097/JHM-D-20-00172	community partnerships, the main purpose/goals of those partnerships,	and 2019; most of them (21) were descriptive studies	reviewed literature in the U.S.	community-based organization hold promise for improving communication and health outcomes, especially related to hospital readmissions	qualitative and quantitative studies	published articles (no gray literature); it is possible that some studies were missed despite a robust search	supports the forming of partnerships between health systems and community-based organizations to improve readmission rates
Hung, D., Truong, Q., Yakir, M. & Nicosia, F. (2018). Hospital-community partnerships to aid transitions for older adults. *Journal of Nursing Care Quality, 33* (3), 221-228. doi: 10.1097/NCQ.0000000000000294.	To determine how successful a community-based transition program is on reducing hospital readmission rates	17 interview participants who were responsible for implementing the transition program; included the director, manager, key staff, and members of steering committee	Semi-structured interviews; qualitative study	Several key factors for success were identified: intervention characteristics, organizational characteristics; implementation process; patient characteristics; implementation measures; implementa-	Level 6 - single qualitative study	Small sample size (17); participants were all from the transition (there were no patients included as participants in the study	Yes, this study would be used to support a change since health coaching was identified as a strength in the program; this study also highlights the need for adequate planning, engagement, and resources for similar programs.

				tion outcomes			
Kangovi, S., Mitra, N., Norton, L., Harte, R., Zhao, X., Carter, T., Grande, D. & Longl, J.A. (2018). Effect of community health worker support on clinical outcomes of low-income patients across primary care facilities: A randomized clinical trial. *JAMA Intern Med. 178*(12):1635–1643. doi:10.1001/jamainternmed.2018.4630	To assess a standard intervention delivered by community health workers. The intervention was the IMPACT program which addressed social determinants of health	Of the 592 participants, 370 (62.5%) were female; mean age: 52.6	2-armed, single-blind, multicenter randomized clinical trial	The intervention group had a lower risk of readmission than the control group	Level 2 – randomized controlled trail	All sites were located in Philadelphia; it is not known if effects lasted past the 9 months of the trial; hospitalization data for veterans were limited to the VA; some data were missing; external validity can be limited	Yes, this study could support a change since the intervention led to a decrease in readmission rates.
Leavitt, M. A., Hain, D. J., Keller, K. B., & Newman, D. (2020). Testing the effect of a home health heart failure intervention on hospital readmissions, heart failure knowledge, self-care, and quality of life. *Journal of Gerontological Nursing, 46*(2), 32–40.	To examine a home health nurse heart failure (HF) intervention which was developed by researchers to reduce readmissions for HF patients.	40 older adults were included: 19 patients with HF were in the intervention group; 21 HF patients were in the intervention group (in the southeastern	Randomized controlled trial	Control group had a 29% rate of readmissions and the intervention group had a 16% rate of readmissions	Level 2 – randomized controlled trial (Melnyk, & Fineout-Overholt, 2015)	Small sample size, therefore, study was underpowered. Results were statistically insignificant and not generalizable.	Yes; even though results were statistically insignificant, the intervention was helpful to many patient in reducing the risk of readmission

https://doi-org.ezproxy.liberty.edu/10.3928/00989134-20191118-01		are of the United States)					and is worth investigating.
Martin, S.L. (2018). Simply delivered meals: A tale of collaboration. *The American Journal of Managed Care, 24*(6), 301–304.	To determine if a specialized meal delivery program could reduce 30-day readmission rates when combined with a community-based care transition program.	622 patients at Maine Medical Center; mean age 71.7 year; 56.6% women;	Time-series design with 24 month rolling enrollment;	The 30-day readmission rate for the intervention group was 10.3% compared to the 16.6% baseline rate.	Level 3 – controlled trial – no randomization (Melnyk & Fineout-Overholt, 2015)	Cannot reliably generalize results; there may be bias in the sample; analyses were limited to one hospital	Yes; even though it was not a controlled trial, there was improvement in readmission rates.
Reid, M., Kephart, G., Andreou, P., & Robinson, A. (2021). Potential of community-based risk estimates for improving hospital performance measures and discharge planning. *BMJ Open Quality, 10*(2), 1-8. http://dx.doi.org.ezproxy.liberty.edu/10.1136/bmjoq-2020-001230	To determine if differences in risk-adjusted readmission rates for specific communities significant enough to be used as a quality indicator for community-based care after discharge	Included all persons in the Nova Scotia, Canada, 30 years and older discharged from the hospital between 2010 and 2014; 43 hospitals were included.	A population based, descriptive study	Community of residence is associated with risk of hospital readmiss-ions; hospitals discharging patients to communities with less ability to address risk factors may be unfairly penalized for high	Level 6 – descriptive study	The effect of a given hospital varies depending on the community and vice versa; researchers did not adjust for socioeconomic factors	Yes, this study would be useful to show that community characterist-ics and partnerships can have a significant impact on readmission rates.

				readmission rates			
Rhodes, H., Simon, H., Hume, H., (2021). Safety-net accountable health model partnership drives inpatient connection to outpatient social services, reducing readmissions in a population experiencing homelessness. *Professional Case Management, 26*, 150-155. https://doi.org/10.1097/NCM.0000000000000466	To determine if screening for homelessness upon admission and connecting patients to social services can reduce readmissions	72 patients were in the intervention group; 61 patients were in the control group; both groups were primarily English speaking, African-American or Native-American men in their 40s.	A quasi-experimental process was used; data were analyzed using the chi-squared or Fisher's exact test	The 30-day readmission rate for the control group was 18% and the rate for the intervention group was 5.6%	Level 3 - Quasi-experimental design	The identification of those at risk of homelessness is not a perfect and the accuracy of screening data needs improvement; although statistically significant, sample size is small	Yes, this study would support the need for identification of risk factors and addressing social determinants of health that affect the risk of readmission
Saab, D., Nisenbaum, R., Dhalla, I., Hwang, S., & Hwang, S. W. (2016). Hospital readmissions in a community-based sample of homeless adults: A matched-cohort study. JGIM: *Journal of General Internal Medicine, 31*(9), 1011–1018.	To compare the hospital readmission rate of those experiencing homelessness with those of a low-income matched control group. The other aim of the study was to identify risk factors	1165 homeless adults	1:1 matched cohort study	Homeless individuals had four times the rate of 30-day readmission to the hospital when compared to low-income controls matched with	Level 4 – cohort study (Melnyk & Fineout-Overhold, 2015).	The study is not generalizable since some individuals were excluded. Also, some of the low-income controls may have experienced homelessness	Yes, this study would be very useful in supporting the need to address social determinants of health (SDOH) and working with community

https://doi.org/10.1007/s11606-016-3680-8	associated with readmission within the group experiencing homelessness.			similar characterist-ics		at some point during the study.	partners to reduce readmission rates.
Spatz, E. S., Bernheim, S. M., Horwitz, L. I., & Herrin, J. (2020). Community factors and hospital wide readmission rates: Does context matter? *PLoS One, 15*(10)http://dx.doi.org.ezproxy.liberty.edu/10.1371/journal.pone.0240222	To assess the effect of community factors on Centers for Medicare and Medicaid Services (CMS) hospital wide readmission (HWR) measures; 71 community variables were assessed in 6 domains related to health outcomes were assessed	Medicare patients (age 65 and older) eligible for HWR measure from July 2014 to June 2015 and who were linked to community variables based on zip codes. There were 6,790,723 participants included.	Single descriptive design using a random forest algorithm to rank variables and then using multivariable regression models for analysis.	It was found that readmissions for many different conditions are influenced by the community in which a person lives and those findings can be used to target interventions to prevent readmissions	Level 6 - single descriptive or qualitative study	Community level variables may not represent the individuals living conditions; data was lacking to fully describe the domains that impacted readmission rates; it is unknown if these community factors would affect those of different ages in the same way	Yes, this study could be used to show that communities affect health outcomes, specifically readmission rates, and health systems must consider this in strategic planning to improve readmission rates.
Struja, T., Baechli, C., Koch, D., Haubitz, S., Eckart, A., Kutz, A., Keaslin, M., Mueller, B., & Schuetz, P. (2020). What are they	To determine the effectiveness of tools to predict risk of readmissions.	A prospective cohort of 15,639 medical patients from a Swiss	Prospective cohort study	The best predictive abilities were seen with the following predictive	Level 4 – cohort study	Readmission was assessed at 30 days and average length of stay is 5 day which shortens	Yes, this study would be used to support a change related to

worth? Six 30-day readmission risk scores for medical inpatients externally validated in a Swiss cohort. *Journal of General Internal Medicine, 35*(7), 2017-2024. http://dx.doi.org.ezproxy.liberty.edu/10.1007/s11606-020-05638-z		tertiary care institution from 2016 through 2018.		models: HOSPITAL, PARA, and the score from Tsui et al. These have high potential to improve patient care.		observed time period by that amount; these studies cannot be directly compared to others due to a difference in the way results were reported.	assessment of readmission risk and the tools that are most predictive of the risk.
Taylor, Y. J., Roberge, J., Rossman, W., Jones, J., Generoso, C., Bobay, C., DeSilva, B., Evans, C., Pracht, M., Dulin, M. F., & Davis, C. J. (2020). A population health approach to transitional care management for high-risk patients with diabetes: Outcomes at a rural hospital. *Population Health Management, 23*(4), 278–285. https://doi-org.ezproxy.liberty.edu/10.1089/pop.2019.0119	To determine the effectiveness of a telephone based transitional care management (TCM) program in rural areas to reduce hospitalizations.	Adult patient in rural areas with high risk of admission; 15, 271 discharges were included and 13.8 % of them were on the TCM program and 68.2% of them were diabetic;	Randomized controlled prospective study	Post-intervention readmission rates were not significantly different in the diabetes group with TCM vs the group without.	Level 2 – randomized controlled trial (Melnyk & Fineout-Overholt, 2015)	The readmission risk was limited to the period just before discharge rather than earlier in the hospital stay, which is not as effective; baseline readmission rates not available for diabetes; not possible to compare between larger population of diabetics and	Yes, this information would still be useful even though the benefit of TCM was limited due to the barriers and challenges found in rural areas related to diabetes education. The information supports the need to address barriers to

						diabetics with TCM.	care in rural areas.
Warchol, S. J., Monestime, J., Mayer, R. W., & Chien, W., (2019). Strategies to reduce hospital readmission rates in a non-Medicaid-expansion state. *Perspectives in Health Information Management*, 1-20. http://ezproxy.liberty.edu/login?qurl=https%3A%2F%2Fwww.proquest.com%2Fscholarly-journals%2Fstrategies-reduce-hospital-readmission-rates-non%2Fdocview%2F2288653214%2Fse-2%3Faccountid%3D12085	To determine if data from the electronic medical record can be used to identify at risk patients and reduce readmission rates	15 participants ranging from executives to manager-level staff across 5 hospitals in southwest Missouri; the hospitals were non-profit; two were in metropolitan areas and three were in rural areas.	Semi-structured interviews with 15 hospital leaders located in five metropolitan and rural hospitals; a case study design was used.	Four themes were identified: population health; hospital operations and patient interactions; leadership and mission; and barriers to reducing readmissions. The barriers include social factors and access to care	Level 6 – single descriptive study	All participants came from the same geographic are of south Missouri and responses may not be generalizable	Yes, this study supports the need to consider and study further the link between social factors and readmission rates and identifying those at risk of readmission.
Weiyi, N., Colayco, D., Hashimoto, J., Komoto, K., Gowda, C., Wearda, B., & McCombs, J. (2017). Impact of a pharmacy-based transitional care program on hospital readmissions. *America*	To ascertain how effective pharmacist led discharge services are on preventing readmissions.	Adult Medicaid managed patients; 830 people met the inclusion criteria for the 30 day analysis and	Prospective cohort study	This program led to a 28% decrease in 30-day readmissions and 31.9% for 180 day readmissions.	Level 4 – cohort study (Melnyk & Fineout-Overholt, 2015)	A non-randomized design was used; generalizability of the results may be limited; observational	Yes, this study would be used to support a change in the care of patients after discharge from

n Journal of Managed Care, 23(3), 170–176.		were compared to 1005 patient with usual care.				study cannot determine causality.	community agencies and/or healthcare profession-als. It demonstrates the efficacy of transitional programs in reducing readmission rates.
Welch, S., Carruth, A., Wood, R. (2018). Improving care transitions: An academic service partnership to achieve coordination of care using students as health coaches. *Journal of Nursing Administration, 48*, 629-635. https://doi.org/10.1097/NNA.0000000000000696	To determine if a transition care model using a health coach from the local university would reduce hospital readmission rates	65 patients with chronic conditions; average age 69; 45% male	Cohort prospective study	The readmission rate for participants in the program was reduced by 72%	Level 4 -case control or cohort study	Lack of needed resources in a rural community such as transportation, adequate home health services, and financial assistance solutions.	Yes, this study supports utilizing partnerships between health systems and academic institutions to reduce readmissions.
Wilcox, D., McCauley, P., Delaney, C. (2018). Evaluation of a hospital: Community	To determine the effectiveness of a community program	Retrospective analysis of Medicare fee for service	Retrospect-ive observational study of 832	30-day readmission rate decreased	Level 6 – single descriptive study	A pre/post- test was used for evaluation without a	Yes, this study supports a change and

partnership to reduce 30-day readmissions. *Professional Case Management, 23,* 327-341. https://doi.org/10.1097/NCM.0000000000000311	(ComPass) in reducing 30-day readmission rates	beneficiaries from May 2012 to November 2014 at a hospital in New England.	Medicare beneficiaries at John Demsey hospital. 61% were female, mean age was 79 years.	from 21% to 16.2%	(Melnyk, & Fineout-Overholt, 2015)	comparison group; the unadjusted 30-day readmission rate did not stratify by risk (may have been biased); evaluation did not consider other efforts to reduce readmissions; no data were collected from those who were approached but not enrolled in the program.	validates the idea that community partnerships should be used to improve patient outcomes.
Xiang, X., Robinson-Lane, S. G., Rosenberg, W., & Alvarez, R. (2018). Implementing and sustaining evidence-based practice in health care: The Bridge Model experience. *Journal of Gerontological Social Work, 61*(3), 280–294. https://doi.org/10.1080/	To analyze the experience of community-based organizations in the Bridge Model experience which strives to reduce readmissions.	Semi-structured interviews with clinical supervisors from 13 CBOs that received Bridge Model training between 2012 and 2015	Qualitative study	Challenges include building effective and sustainable partnerships with hospitals, financial barriers, and staff turnover;	Level 6 – Qualitative study	Small sample size of 13; the representativeness of the sample size was limited by staff turnover in the CBOs, and inactive sites may not have	Yes, this study would support the need to plan and build strong partnerships to ensure the success of evidence-based programs to

01634372.2018.1445154				facilitators include organizational champions, culture of organization, and value of evidence.		participated in the study	improve readmission rates.

Appendix B

CITI Program Certificate

CITI PROGRAM

Completion Date 02-Apr-2021
Expiration Date 01-Apr-2024
Record ID 41726379

This is to certify that:

Marlene Smalley

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Biomedical Research - Basic/Refresher
(Curriculum Group)
Biomedical & Health Science Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Liberty University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w7b5f3c3e-c738-405d-86a2-f0835c6bfe40-41726379

Appendix C

IRB Letter

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

July 20, 2021

Marlene Smalley
Dana Woody

Re: IRB Application - IRB-FY21-22-33 Reducing Readmissions-Beyond the Four Walls
Dear Marlene Smalley and Dana Woody,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your project with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study is not considered human subjects research for the following reason:

"Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected," are not considered research according to 45 CFR 46.102(l)(1).

Please note that this decision only applies to your current application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

Also, although you are welcome to use our recruitment and consent templates, you are not required to do so. If you choose to use our documents, please replace the word *research* with the word *project* throughout both documents.

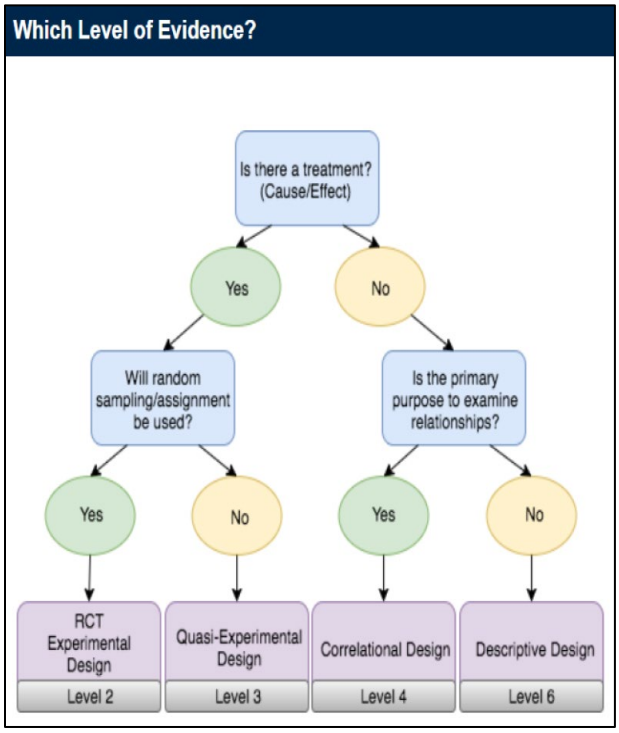
If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

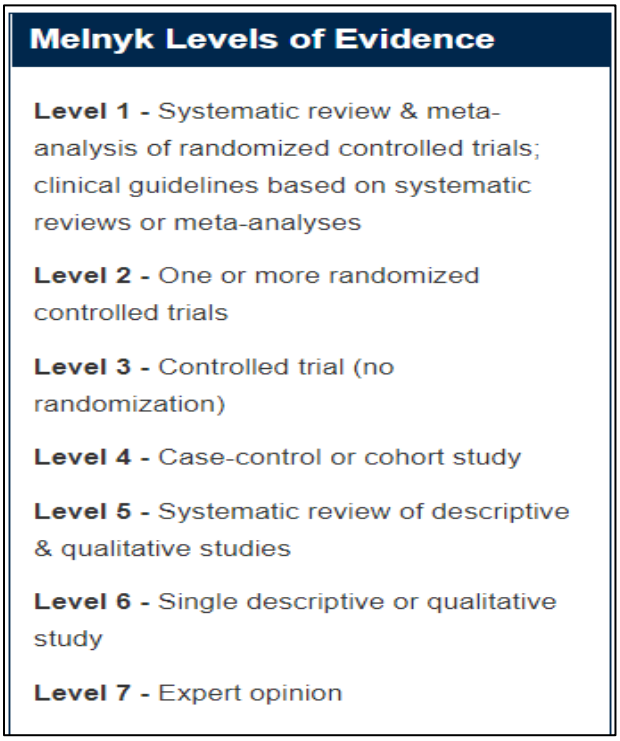
Sincerely,

[redacted]
Administrative Chair of Institutional Research
Research Ethics Office

Appendix D

Melnyk Levels of Evidence





Modified from:

Melnyk, B.M. & Fineout-Overholt, E. (2015). "Box 1.3: Rating system for the hierarchy of evidence for intervention/treatment questions" in *Evidence-based practice in nursing & healthcare: A guide to best practice (3rd ed.)* (p. 11). Wolters Kluwer Health.

Appendix E

PRISMA Checklist

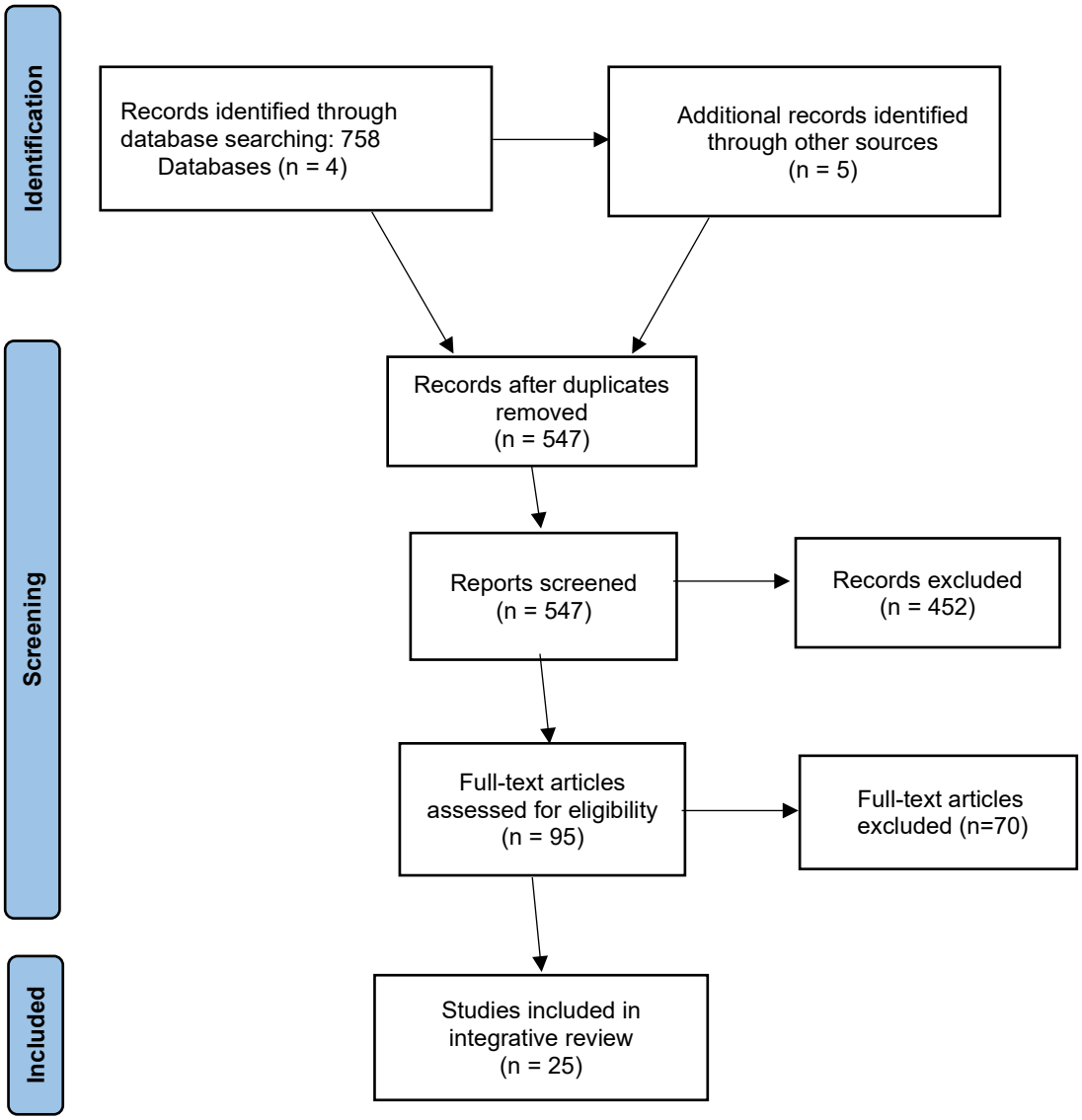
Section/Topic	#	Checklist Item	Reported on Page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	

doi:10.1371/journal.pmed.1000097.t001

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Med 6*(7): e1000097. https://doi.org/10.1371/journal.pmed.1000097

Appendix F

PRISMA 2020 Flow Diagram



Page, M.J., McKenzie, J.E., Bossuyt. P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*(7), 1. doi: 10.1136/bmj.n71