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Measurement of unnecessary psychiatric readmissions: a scoping review protocol

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ABSTRACT

Introduction: Care transition for patients being discharged from inpatient mental health care to outpatient settings is a growing focus for health care delivery systems. Many studies of this inpatient-to-outpatient transition use the rate of post-discharge readmissions as a patient-level outcome measure to assess the quality of transition. However, it is unclear how studies define the measure, and whether there is a shared understanding by the field regarding which definition is appropriate for which circumstances. This scoping review thus aims to examine how published studies have approached measuring psychiatric readmissions.

Methods and analysis: The scoping review will be structured according to Levac et al.'s enhancement to Arksey and O'Malley's framework for conducting scoping studies. The protocol is registered through the Open Science Framework (https://osf.io/5nxuc/). We will search literature databases for studies that (i) are about interventions associated with psychiatric readmissions and (ii) specify use of at least one readmission time interval (i.e., time period since previous discharge from inpatient care, within which a hospitalization can be considered a readmission). Screening and review of articles will be carried out by two reviewers, first independently then involving a third reviewer as needed for consensus. We will assess review findings through both tabular and thematic analyses, noting prevalent trends in study characteristics and emergent themes across our reviewed studies.

Ethics and dissemination: This work comes at a time of heightened interest by many mental health care systems in high quality practices that structure their care processes toward effective inpatient-to-outpatient transitions. Findings will support the systems' careful examination of alternative potential transitional interventions, helping to ensure that their often limited quality enhancement resources are put to optimal use. We will focus on disseminating our findings to the health care community through strong communication infrastructures and connections with health system stakeholders that our multidisciplinary study consultants will foster throughout this study.

ARTICLE SUMMARY

Strengths and limitations of this study

- This review plans a comprehensive search of how unnecessary psychiatric readmissions are measured, closely following Levac and colleagues' established methodological framework for conducting scoping studies.
- This review does not aim to assess the effectiveness of approaches used by the included studies in measuring unnecessary psychiatric readmissions. This aligns with the purpose of conducting scoping reviews, which are to identify current gaps in knowledge and to establish a new research agenda.
- Other ways of measuring unnecessary psychiatric readmissions may exist that have not been published as peer-reviewed journal articles that are indexed by the databases included in our review.
- This scoping review will form an essential knowledge base upon which to build future designs, implementations, and evaluations of interventions that enable safe and appropriate care transitions from inpatient to outpatient mental health care settings.

INTRODUCTION

Poor transitions between care settings are known to heighten risks of hospital readmission and worsening of symptoms.[1] This is particularly true for inpatient-to-outpatient transitions. Being connected to outpatient care within seven days of discharge is a widely accepted indicator of transition quality, but this actually occurs for less than half of discharged patients within the U.S.[2] Furthermore, even as care transition interventions are being increasingly tested for general medical populations, few specifically target mental health populations.[3]

Mental health conditions affect 46.6% of the U.S. population during their lives and 26.6% of them in any given year.[4] Care transition for patients being discharged from inpatient mental health care to outpatient settings is a growing focus for health care delivery systems. This has been especially true as more of them align their practices to the evidence-based Collaborative Care Model (CCM).[5-7] The CCM is grounded in delivering anticipatory, coordinated, and patient-centered care,[5, 8, 9] and in turn calls for communicative and collaborative transition processes that make such care possible.

Studies of these inpatient-to-outpatient transition processes, both observational[10, 11] and interventional,[12, 13] are thus on the rise, and many of them use the rate of post-discharge readmissions as a patient-level outcome measure to assess the quality of transition.[14, 15] It is currently unclear, however, how exactly studies define the measure, and whether there is a shared understanding by the field regarding which definition is appropriate for which circumstances. Namely, readmissions rate associated with a care setting is its proportion of patients who are re-hospitalized within a certain time period since their previous hospitalization. Defining this requires, at minimum, (i) specification of the time period (i.e., readmission time interval), (ii) classification of "re"-hospitalization (i.e., related to the previous hospitalization and therefore possibly unnecessary or preventable, as opposed to an unrelated hospitalization due to a new care need), and (iii) cases that should be included/excluded from consideration.

3M Health Information Systems' Potentially Preventable Readmissions Classification System [16] offers a proprietary methodology for measuring readmissions that is widely used by health care systems,[17] insurance companies,[18] and state-wide organizations.[19] Its publicly available information describes the methodology's ability to consider mental health or substance abuse problems as critical factors to adjust for in measurement.[20] It is difficult to glean from the information, however, what constitutes a meaningful readmission time interval and any mental health-specific considerations that need to be made when measuring psychiatric readmissions.

In order to advance the field regarding transitional interventions to prevent psychiatric readmissions, we first need to establish approaches to measuring psychiatric readmissions that, if not uniform, can at least be made explicit as to how they relate to or differ from one another. Thus, as a first step towards the eventual goal of being able to rigorously evaluate transitional interventions' effect on psychiatric readmissions rates, we will conduct a scoping review of peer-reviewed literature to delineate the current landscape of how published studies have approached measuring psychiatric readmissions. We outline below our review protocol, and also discuss our work's timeliness in terms of ethical considerations and plans for dissemination to those most in need of knowledge to be generated though this work.

OBJECTIVE

The objective of this scoping review is to systematically examine what is known in the literature about measuring unnecessary psychiatric readmissions. Closely aligning to the purpose of conducting scoping reviews, we will aim to map current knowledge, identify existing gaps, and set the research agenda with regards to measuring unnecessary psychiatric readmissions.

METHODS AND ANALYSIS

We will structure the steps of the scoping review according to Levac et al.'s enhancement[21] to Arksey and O'Malley's six-stage methodological framework for conducting scoping studies.[22] The framework's six stages include (i) defining the research question, (ii) identifying relevant literature, (iii) study selection, (iv) data extraction, (v) collating, summarizing, and reporting the results, and (vi) consultation process and engagement of knowledge users. We will align to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extensions for Protocols (PRISMA-P);[23] Supplementary File 1) and Scoping Reviews (PRISMA-ScR)[24] for conducting and reporting on the specific review steps. Modeling after Marchand and colleagues' 2018 protocol for a scoping review of patient-centered care for addiction treatment,[25] we will take an iterative and reflexive approach throughout the review process, especially to refine our study selection and data extraction steps (Stages 3 and 4 below) to best target meeting our objective. Our protocol is registered through the Open Science Framework (https://osf.io/5nxuc/),[26] and all tracking for literature identification, study selection, data extraction, and results synthesis will be carried out using Microsoft Excel spreadsheet software[27].

Stage 1: Defining the research question

We developed our research question by following the recommendations of Levac et al.'s enhanced framework[21] to start broadly then hone the question while keeping in mind the scoping review's main purpose. We started with, "What is known about measuring unnecessary psychiatric readmissions?" We found our notion of "unnecessary readmission" to be accurately described by Goldfield et al.[28]'s definition of "potentially preventable readmission" – a subsequent admission that occurs within the readmission time interval and is clinically related to a prior admission, where (i) readmission is a return hospitalization to an acute care hospital that follows a prior acute care admission within a specified time interval (i.e., readmission time interval), (ii) readmission time interval is the maximum number of days allowed between the discharge date of a prior admission and the admitting date of a subsequent admission, and (iii) a readmission's clinical relationship to a prior admission is established using diagnostic classifications, often the principal diagnosis associated with each admission.

An initial exploratory search of article databases including National Center for Biotechnology Information (NCBI – PubMed) revealed several systematic reviews of discharge planning and transitional interventions associated with psychiatric readmissions.[29-31] Although findings from these reviews

were focused on examining the interventions' content and their related multi (e.g., individual to system)-level characteristics, these works helpfully noted that they came across substantial variabilities in how their reviewed studies (i) designated the readmission time interval to be considered,[29, 30] (ii) set the inclusion/exclusion criteria for unnecessary readmissions,[31] and (iii) approached case-mix adjustment in their measurement of readmission rates to account for factors related to a patient's clinical status that are associated with readmission risk.[31]

Hence, this scoping review aims to answer the following questions:

1. What durations are used as the psychiatric readmission time interval?
2. What criteria are applied to designating a psychiatric readmission as unnecessary?
3. What risks are adjusted for in calculating psychiatric readmission rates?

We plan to additionally examine any reasons put forth by our reviewed studies on their choices of these durations, criteria, and risks.

Stage 2: Identifying relevant literature

In order to systematically examine what is known about measuring unnecessary psychiatric readmissions, we will conduct a comprehensive review of the existing literature and evidence base. To ensure methodological rigor, our search strategy (Supplementary File 2) will include a range of bibliographic databases and related article searching. 'Readmission' is often used interchangeably with related terms such as unnecessary hospitalization, inappropriate hospitalization, unplanned admission, or unscheduled admission.[32] Our research objective therefore poses a challenge to keyword formulation. The search strategy will address this issue by being iteratively developed by the research team in collaboration with experienced medical and social services librarians as well as consulting experts within the field. This peer review of the search strategy will also provide a subjective validation.[33] Search terms will be harvested using benchmark article terms and subject headings, titles and abstracts of key articles, dictionaries, and synonyms and subject headings within Embase and Pubmed's MeSH database.

The electronic databases in which the comprehensive search will be conducted include Medline (Ovid), Embase (Ovid), PsycINFO, CINAHL, Cochrane, and ISI Web of Science. These sources include relevant journals within the fields of medicine, health services, and the social sciences and were selected to capture a comprehensive sample of literature. Boolean logic and proximity operators will be used to combine and refine search terms. The first 100 search results from each database will be reviewed by the research team to ensure validity of the search strategy.

Stage 3: Study selection

Selection of studies to include in our scoping review will proceed in two phases. In the initial title/abstract screening phase, we will designate a study or a literature review of studies to be eligible for the subsequent full-text screening phase if it (i) concerns the mental health population, (ii) measures psychiatric readmission rates, (iii) is set in a health care context, and (iv) is a peer-reviewed journal article published in English through February 2019 (we will exclude editorial and other articles that report on individual viewpoints). Then, in the full-text screening phase, we will designate a study or a literature review of studies to be included in the scoping review if it (v) is regarding an intervention (for either research investigation or quality improvement) associated with psychiatric readmission and (vi)

specifies at least one readmission time interval used.

We have developed these criteria for study selection a priori, collaboratively as a research team and in close discussions with our consultants (please see the section below on Stage 6: Consultation process and engagement of knowledge users). For each phase, the criteria will first be applied to the larger of ten articles or 10% of articles to be screened, then refined to be applied to the remaining articles. Two independent screeners (CW and BK) will be responsible for first independently screening, then comparing with one another their individual decisions on, whether each article meets the criteria. For articles for which the individual decisions differ, a third screener (CBW) will be involved in discussions toward reaching group consensus.

Stage 4: Data extraction

Identified literature and their selection status through the title/abstract and full-text screening phases will be tracked using Microsoft Excel[27] spreadsheet files. Data extraction from resulting articles to be included in the scoping review will use an Excel-based template designed to collect the article identification number and relevant information from each article. The domains for which data will be extracted are listed and defined in Table 1. The data extraction template, particularly its domains and definitions, will be piloted on the larger of ten or 10% of articles to be reviewed, then refined for data extraction from the remaining articles. CW will serve as the primary data extractor for half of the articles, and BK will serve as the secondary extractor, reviewing the same articles to verify and augment the extraction. The other half of the articles will have BK as the primary data extractor and CW as the secondary extractor. Articles for which the primary and secondary data extractors do not agree on the extracted content will involve a third reviewer (CBW) to discuss towards reaching consensus.

Table 1: Definitions of domains for which data will be extracted.

Domain	Definition
Author(s)	Author(s) of the article
Year	Article's year of publication
Country	Article's country of publication
Objective	Aim of the study
Design	Approach taken by the study to reach its aim – e.g., experimental/observational, quantitative/qualitative/mixed-methods, review
Health care context and setting	Clinical, organizational, and geographical environment in which the study was conducted – e.g., inpatient psychiatric care, integrated health care system, urban/rural practice

Target population	Population to which the study results are meant to be applicable
Sample size	Number of individuals, clinics, and/or organizations (depending on the study's focus) involved in the study
Intervention	The difference across which study outcomes were examined (i.e., independent variable) – e.g., a newly implemented inpatient-to-outpatient discharge planning tool
Control	Individuals, clinics, and/or organizations (depending on the study's focus) used as a baseline against which the intervention's impact was assessed – e.g., parallel, historical, not applicable
Readmission time interval	Duration since the previous discharge from inpatient care, within which an acute care hospitalization was considered to be a readmission
Criteria for designating a readmission as unnecessary	Standards applied by the study to designate an admission as a readmission – e.g., occurred within a certain readmission time interval of a prior admission, diagnostically related to a prior admission
Criteria for excluding a readmission from being considered unnecessary	Standards applied to exclude a readmission from being a part of the study's readmission rate calculation – e.g., associated with conditions for which subsequent readmissions are expected
Risk adjustments in calculating readmission rates	Factors potentially influencing the readmission rate (and are independent of care quality) that the study accounted for – e.g., symptom severity
Other outcomes	Measurements other than for readmissions that the study also examined across its comparison groups (i.e., dependent variables)
Key findings	Main results of the study
Additional notes	Other information from the article that may be pertinent to this scoping review

Stage 5: Collating, summarizing, and reporting the results

The extracted data will be readied for presentation using a tabular representation. Aligning to the specific questions that our scoping review aims to answer (listed under the section above on Stage 1: Defining the research question), we will summarize the findings along the dimensions of (i) readmission time interval, (ii) unnecessary readmission definition, and (iii) case-mix adjustment approach used by our reviewed studies. We will follow PRISMA-ScR[24]'s guidelines for reporting these findings.

In addition to the main dimensions along which the findings will be tabulated and examined, we will conduct a thematic analysis of prevalent trends in study characteristics across our reviewed studies.

CW and BK will independently review the extracted data to identify emergent codes representative of the nature of the study design and key findings. Constant comparison combined with consensus-building discussions[34] will be used to finalize the list of emergent codes and their definitions. We will identify overarching themes based on reviewing the data associated with each code, and supplement delineation of the themes using relevant numerical trends from the data for additional context (e.g., proportion of studies conducted within an integrated care system context).

Stage 6: Consultation process and engagement of knowledge users

Keeping in mind the initial motivation for our scoping review to inform future research to implement evidence-based inpatient-to-outpatient transition models into mental health care systems, we will closely engage our multidisciplinary research colleagues and partnered health care system representatives for each of Stages 1 through 5 above. These individuals have clinical and administrative expertise in mental health care delivery and their system-wide organization, including front-line practitioners, leadership of local, regional, and national care networks, and health services researchers with expertise in care transitions and admissions data. They have already played a key role in helping us understand the current status of readmissions measurement and formulating the questions that our scoping review will focus on answering. We plan to seek ongoing consultation from these individuals, to help ensure relevant contextualization of our review efforts.

Patient and public involvement

To ensure that patient perspectives are fully incorporated into every step of our planned scoping review, our consultants include patient representatives who will actively shape the research team's consensus, methods refinement, interpretation of findings, and subsequent research planning. These representatives came to be involved with our work through the first author's research center [Center for Healthcare Organization and Implementation Research (CHOIR), a Department of Veterans Affairs Health Services Research & Development Center of Innovation]'s established Veterans Engagement Research Group (VERG). VERG is a CHOIR-based community that is explicitly chartered to engage veterans and their family members as active partners in research through communication regarding opportunities to be involved, co-development of research ideas, and collaboration on tasks. VERG's quarterly meetings will serve as a key forum through which we will regularly share our progress and receive additional timely feedback.

ETHICS AND DISSEMINATION

This review, to our knowledge, is the first to focus on comprehensively outlining the landscape of how psychiatric readmissions are defined for measurement. This work will be conducted at a time of heightened interest by many health care systems in devising high quality practices that structure their care processes toward effectively coordinating inpatient-to-outpatient transitions.[35, 36] Particularly for public sector organizations with substantial commitments to delivering mental health care, findings from our review will support their careful examination of alternative potential transitional interventions, helping to ensure that their often limited quality enhancement resources[37] are put to optimal use.

We will share findings from this scoping review with the scientific community through peer-reviewed journal publications and presentations at national conferences. We will additionally focus on disseminating our findings to the larger health care community through both existing communication infrastructures (e.g., VERG, described in the section above on Patient and Public Involvement) and newly formed connections with health system stakeholders that our multidisciplinary consultants (please see the section above on Stage 6: Consultation process and engagement of knowledge users) will help foster. Importantly, this close communication with stakeholders will help shape our subsequent research agenda to ensure that it is appropriate and feasible, maximizing the potential for real-world health system impact.

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Author contributions: BK and CW developed the scoping review protocol, with close guidance from EKP on the review's conceptualization. CW led the development of the search strategy and refined the data extraction domains together with BK and CBW. BK led the preparation of the manuscript draft, and CW, CBW, and EKP provided critical revisions to the manuscript's intellectual content. All authors read and approved the final manuscript.

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Competing interests: The authors declare that they have no competing interests.

Data availability statement: There are no data in this work.

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Supplementary File 1

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Reported on Page #
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	9
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	9
Sponsor	5b	Provide name for the review funder and/or sponsor	N/A
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	3
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4-5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	5-6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	5
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	5
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6

Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	6
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	6-7
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	7
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	N/A for scoping review
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	7-8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	7-8
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	7-8
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	7-8
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	N/A for scoping review
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	N/A for scoping review

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

Supplementary File 2

Medline (Ovid) search strategy

Search term/line number	Conceptual term of interest	Search term entered into Ovid-Medline	Number of hits
1	Mental disorders	psychiatric.ti. OR “mental disorder".ti. OR "mental disorders".ti. OR "mental illness".ti. OR "mentally ill".ti.	83986
2	Inpatient psychiatric settings	Exp "Psychiatric hospitals"/ OR Exp "hospital Psychiatric Department"/ OR "Psychiatric treatment center".mp. OR "Psychiatric Hospital".mp. OR "psychiatric unit".mp. OR "psychiatric units".mp. OR "Mental Institution".mp. OR "Mental Hospital".mp. OR "Psychiatric Department".mp. OR "Psychiatric treatment centers".mp. OR "Psychiatric Hospitals".mp. OR "Mental Institutions".mp. OR "Mental Hospitals".mp. OR "Psychiatric Departments".mp. OR "Psychiatric Ward".mp. OR"psychiatric inpatient".mp. OR "psychiatric inpatients".mp.	41507
3	Inpatient psychiatric admission	"psychiatric hospitalization".mp. OR "psychiatric hospitalizations".mp. OR "psychiatric readmission".mp. OR "psychiatric readmissions".mp. OR "psychiatric rehospitalization".mp. OR "psychiatric rehospitalizations".mp. OR "psychiatric admission".mp. OR "psychiatric admissions".mp	2905
5		1 or 2 or 3	110553
6	Patient Readmission	Exp "Patient Readmission"/	14332
7	Readmission	Readmission*.mp. OR readmitted.ti.	28315
8	Rehospitalization	Rehospitali*.mp.	5515
9	Unnecessary admissions	"Unnecessary admission".mp. OR "preventable hospitalizations".mp. OR "preventable hospitalization".mp.	315
10		6 or 7 or 8 or 9	31946
11		5 and 10	1747

Date of search run: 11 March 2019

BMJ Open

Measurement of unnecessary psychiatric readmissions: a scoping review protocol

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Primary Subject Heading:	Mental health
Secondary Subject Heading:	Health services research
Keywords:	hospital readmission, administrative data, care transition, patient discharge, MENTAL HEALTH

Measurement of unnecessary psychiatric readmissions: a scoping review protocol

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ABSTRACT

Introduction: Care transition for patients being discharged from inpatient mental health care to outpatient settings is a growing focus for health care delivery systems. Many studies of this inpatient-to-outpatient transition use the rate of post-discharge readmissions as a patient-level outcome measure to assess the quality of transition. However, it is unclear how studies define the measure, and whether there is a shared understanding by the field regarding which definition is appropriate for which circumstances. This scoping review thus aims to examine how published studies have approached measuring unnecessary psychiatric readmissions.

Methods and analysis: The scoping review will be structured according to Levac et al.'s enhancement to Arksey and O'Malley's framework for conducting scoping reviews. The protocol is registered through the Open Science Framework (https://osf.io/5nxuc/). We will search literature databases for studies that (i) are about care transition processes associated with unnecessary psychiatric readmissions and (ii) specify use of at least one readmission time interval (i.e., time period since previous discharge from inpatient care, within which a hospitalization can be considered a readmission). Screening and review of articles will be carried out by two reviewers, first independently then involving a third reviewer as needed for consensus. We will assess review findings through both tabular and thematic analyses, noting prevalent trends in study characteristics and emergent themes across our reviewed studies.

Ethics and dissemination: This work comes at a time of heightened interest by many mental health care systems in high quality practices that structure their care processes toward effective inpatient-to-outpatient transitions. Findings will support the systems' careful examination of alternative potential transitional interventions, helping to ensure that their often limited quality enhancement resources are put to optimal use. We will focus on disseminating our findings to the health care community through strong communication infrastructures and connections with health system stakeholders that our multidisciplinary study consultants will foster throughout this study.

ARTICLE SUMMARY

Strengths and limitations of this study

- This review plans a comprehensive search of how unnecessary psychiatric readmissions are measured, closely following Levac and colleagues' established methodological framework for conducting scoping reviews.
- This review does not aim to assess the effectiveness of approaches used by the included studies in measuring unnecessary psychiatric readmissions. This aligns with the purpose of conducting scoping reviews, which are for identifying current gaps in knowledge and for establishing a new research agenda.
- Other ways of measuring unnecessary psychiatric readmissions may exist that have not been published as peer-reviewed journal articles that are indexed by the databases included in our review.
- This scoping review will form an essential knowledge base upon which to build future designs,

implementations, and evaluations of interventions that enable safe and appropriate care transitions from inpatient to outpatient mental health care settings.

INTRODUCTION

Poor transitions between care settings are known to heighten risks of hospital readmission and worsening of symptoms.[1] This is particularly true for inpatient-to-outpatient transitions. Being connected to outpatient care within seven days of discharge is a widely accepted indicator of transition quality, but this actually occurs for less than half of discharged patients within the U.S.[2] Furthermore, even as care transition interventions are being increasingly tested for general medical populations, few specifically target mental health populations.[3]

Mental health conditions affect 46.6% of the U.S. population during their lives and 26.6% of them in any given year.[4] Care transition for patients being discharged from inpatient mental health care to outpatient settings is a growing focus for health care delivery systems. This has been especially true as more of them align their practices to the evidence-based Collaborative Care Model (CCM).[5-7] The CCM is grounded in delivering anticipatory, coordinated, and patient-centered care,[5, 8, 9] and in turn calls for communicative and collaborative transition processes that make such care possible.

Studies of these inpatient-to-outpatient transition processes, both observational[10, 11] and interventional,[12, 13] are thus on the rise, and many of them use the rate of post-discharge readmissions as a patient-level outcome measure to assess the quality of transition.[14, 15] It is currently unclear, however, how exactly studies define the measure, and whether there is a shared understanding by the field regarding which definition is appropriate for which circumstances. Namely, readmissions rate associated with a care setting is its proportion of patients who are re-hospitalized within a certain time period since their previous hospitalization. Defining this requires, at minimum, (i) specification of the time period (i.e., readmission time interval), (ii) classification of "re"-hospitalization (i.e., related to the previous hospitalization and therefore possibly unnecessary or preventable, as opposed to an unrelated hospitalization due to a new care need), and (iii) cases that should be included/excluded from consideration.

We found our notion of "unnecessary readmission" to be accurately described by Goldfield et al.[16]'s definition of "potentially preventable readmission" – a subsequent admission that occurs within the readmission time interval and is clinically related to a prior admission, where (i) readmission is a return hospitalization to an acute care hospital that follows a prior acute care admission within a specified time interval (i.e., readmission time interval), (ii) readmission time interval is the maximum number of days allowed between the discharge date of a prior admission and the admitting date of a subsequent admission, and (iii) a readmission's clinical relationship to a prior admission is established using diagnostic classifications, often the principal diagnosis associated with each admission.

3M Health Information Systems' Potentially Preventable Readmissions Classification System [17] offers a proprietary methodology for measuring readmissions that is widely used by health care systems,[18] insurance companies,[19] and state-wide organizations.[20] Its publicly available information describes the methodology's ability to consider mental health or substance abuse problems as critical factors to adjust for in measurement.[21] It is difficult to glean from the information, however, what constitutes a meaningful readmission time interval and any mental health-specific considerations that

need to be made when measuring unnecessary psychiatric readmissions.

In order to advance the field regarding transitional interventions to prevent unnecessary psychiatric readmissions, we first need to establish approaches to measuring unnecessary psychiatric readmissions that, if not uniform, can at least be made explicit as to how they relate to or differ from one another. Thus, as a first step towards the eventual goal of being able to rigorously evaluate transitional interventions' effect on unnecessary psychiatric readmissions rates, we will conduct a scoping review of peer-reviewed literature to delineate the current landscape of how published studies have approached measuring unnecessary psychiatric readmissions. Considering that unnecessary psychiatric readmissions may be measured differently for different populations, we will focus on the adult population and include as a part of our review the diagnoses, comorbitidies, and voluntariness of readmissions that are examined by the studies. We outline below our review protocol, and also discuss our work's timeliness in terms of ethical considerations and plans for dissemination to those most in need of knowledge to be generated though this work.

OBJECTIVE

The objective of this scoping review is to systematically examine what is known in the literature about measuring unnecessary psychiatric readmissions. Closely aligning to the purpose of conducting scoping reviews, we will aim to map current knowledge, identify existing gaps, and set the research agenda with regards to measuring unnecessary psychiatric readmissions.

METHODS AND ANALYSIS

We will structure the steps of the scoping review according to Levac et al.'s enhancement[22] to Arksey and O'Malley's six-stage methodological framework for conducting scoping reviews.[23] The framework's six stages include (i) defining the research question, (ii) identifying relevant literature, (iii) study selection, (iv) data extraction, (v) collating, summarizing, and reporting the results, and (vi) consultation process and engagement of knowledge users. We will align to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extensions for Protocols (PRISMA-P)[24] (Supplementary File 1) and Scoping Reviews (PRISMA-ScR)[25] for conducting and reporting on the specific review steps. Modeling after Marchand and colleagues' 2018 protocol for a scoping review of patient-centered care for addiction treatment,[26] we will take an iterative and reflexive approach throughout the review process, especially to refine our study selection and data extraction steps (Stages 3 and 4 below) to best target meeting our objective. Our protocol is registered through the Open Science Framework (https://osf.io/5nxuc/),[27] and we will use EndNote[28] in combination with Microsoft Excel spreadsheet software[29] for tracking and conducting literature identification, study selection, data extraction, and results synthesis.

Stage 1: Defining the research question

We developed our research question by following the recommendations of Levac et al.'s enhanced

framework[22] to start broadly then hone the question while keeping in mind the scoping review's main purpose. We started with, "What is known about measuring unnecessary psychiatric readmissions?" An initial exploratory search of article databases including National Center for Biotechnology Information (NCBI – PubMed) revealed several systematic reviews of discharge planning and transitional interventions associated with psychiatric readmissions.[30-32] Although findings from these reviews were focused on examining the interventions' content and their related multi (e.g., individual to system)-level characteristics, these works helpfully noted that they came across substantial variabilities in how their reviewed studies (i) designated the readmission time interval to be considered,[30, 31] (ii) set the inclusion/exclusion criteria for unnecessary readmissions,[32] and (iii) approached case-mix adjustment in their measurement of readmission rates to account for factors related to a patient's clinical status that are associated with readmission risk.[32]

Hence, this scoping review aims to answer the following questions:

1. What durations are used as the unnecessary psychiatric readmission time interval?
2. What criteria are applied to designating a psychiatric readmission as unnecessary?
3. What risks are adjusted for in calculating unnecessary psychiatric readmission rates?

We plan to additionally examine any reasons put forth by our reviewed studies on their choices of these durations, criteria, and risks.

Stage 2: Identifying relevant literature

In order to systematically examine what is known about measuring unnecessary psychiatric readmissions, we will conduct a comprehensive review of the existing literature and evidence base. To ensure methodological rigor, our search strategy (Supplementary File 2) will include a range of bibliographic databases and related article searching. 'Readmission' is often used interchangeably with related terms such as unnecessary hospitalization, inappropriate hospitalization, unplanned admission, or unscheduled admission.[33] Our research objective therefore poses a challenge to keyword formulation. The search strategy will address this issue by being iteratively developed by the research team in collaboration with experienced medical and social services librarians as well as consulting experts within the field. This peer review of the search strategy will also provide a subjective validation.[34] Search terms will be harvested using benchmark article terms and subject headings, titles and abstracts of key articles, dictionaries, and synonyms and subject headings within Embase and Pubmed's MeSH database.

The electronic databases in which the comprehensive search will be conducted include Medline (Ovid), Embase (Ovid), PsycINFO, CINAHL, Cochrane, and ISI Web of Science. [Supplementary File 2 demonstrates our search using Medline (Ovid) that resulted in 1,747 identified articles.] These sources include relevant journals within the fields of medicine, health services, and the social sciences and were selected to capture a comprehensive sample of literature. Boolean logic and proximity operators will be used to combine and refine search terms. Duplicate articles will be removed. The first 100 search results from each database will be reviewed by the research team to ensure validity of the search strategy.

Stage 3: Study selection

Selection of studies to include in our scoping review will proceed in two phases. In the initial title/abstract screening phase, we will designate a study or a literature review of studies to be eligible

for the subsequent full-text screening phase if it (i) concerns the mental health population, (ii) measures psychiatric readmission rates, (iii) is set in a health care context, and (iv) is a peer-reviewed journal article published in English from January 2009 through February 2019 (we will exclude editorial and other articles that report on individual viewpoints). Then, in the full-text screening phase, we will designate a study or a literature review of studies to be included in the scoping review if it (v) is conducted in (and explicitly mentions) the context of some care transition process that is either already being carried out (for non-intervention studies) or is being tested as an intervention (for intervention studies) and (vi) specifies at least one readmission time interval used.

We have developed these criteria for study selection a priori, collaboratively as a research team and in close discussions with our consultants (please see the section below on Stage 6: Consultation Process and Engagement of Knowledge Users). For each phase, the criteria will first be applied to the larger of ten articles or 10% of articles to be screened, then refined to be applied to the remaining articles. Two independent screeners (CW and BK) will be responsible for first independently screening, then comparing with one another their individual decisions on, whether each article meets the criteria. We will calculate Cohen's kappa and percent agreement to assess inter-rater reliability/agreement between the screeners. For articles for which the individual decisions differ, a third screener (CBW) will be involved in discussions toward reaching group consensus.

Stage 4: Data extraction

Identified literature and their selection status through the title/abstract and full-text screening phases will be tracked using EndNote[28] and Microsoft Excel[29] spreadsheet files. Data extraction from resulting articles to be included in the scoping review will use an Excel-based template designed to collect the article identification number and relevant information from each article. The domains for which data will be extracted are listed and defined in Table 1. Although our focus is on measurements of unnecessary psychiatric readmissions, we are opting to extract data on intervention and controls, if applicable to the study being reviewed, to understand in detail the context under which the study used its approach to measuring unnecessary psychiatric readmissions. The data extraction template, particularly its domains and definitions, will be piloted on the larger of ten or 10% of articles to be reviewed, then refined for data extraction from the remaining articles. CW will serve as the primary data extractor for half of the articles, and BK will serve as the secondary extractor, reviewing the same articles to verify and augment the extraction. The other half of the articles will have BK as the primary data extractor and CW as the secondary extractor. Articles for which the primary and secondary data extractors do not agree on the extracted content will involve a third reviewer (CBW) to discuss towards reaching consensus.

Table 1: Definitions of domains for which data will be extracted.

Domain	Definition
Author(s)	Author(s) of the article
Year	Article's year of publication
Country	Article's country of publication

Objective	Aim of the study
Design	Approach taken by the study to reach its aim – e.g., experimental/observational, quantitative/qualitative/mixed-methods, review
Health care context and setting	Clinical, organizational, and geographical environment in which the study was conducted – e.g., inpatient psychiatric care, integrated health care system, urban/rural practice
Study/Target population	Population to which the study results are meant to be applicable
Diagnoses and comorbidities	Primary diagnoses defining the target population and comorbities accounted for in the study
Sample size	Number of individuals, clinics, and/or organizations (depending on the study's focus) involved in the study
Intervention	The difference across which study outcomes were examined (i.e., independent variable) – e.g., a newly implemented inpatient-to-outpatient discharge planning tool
Control	Individuals, clinics, and/or organizations (depending on the study's focus) used as a baseline against which the intervention's impact was assessed – e.g., parallel, historical, not applicable
Voluntariness of re/admissions	Whether the re/admissions being considered by the study are voluntary and/or involuntary
Readmission time interval	Duration since the previous discharge from inpatient care, within which an acute care hospitalization was considered to be a readmission
Criteria for designating a readmission as unnecessary	Standards applied by the study to designate an admission as a readmission – e.g., occurred within a certain readmission time interval of a prior admission, diagnostically related to a prior admission
Criteria for excluding a readmission from being considered unnecessary	Standards applied to exclude a readmission from being a part of the study's readmission rate calculation – e.g., associated with conditions for which subsequent readmissions are expected
Risk adjustments in calculating readmission rates	Factors potentially influencing the readmission rate (and are independent of care quality) that the study accounted for – e.g., symptom severity
Other outcomes	Measurements other than for readmissions that the study also examined across its comparison groups (i.e., dependent variables)
Key findings	Main results of the study

Additional notes	Other information from the article that may be pertinent to this scoping review

Stage 5: Collating, summarizing, and reporting the results

The extracted data will be readied for presentation using a tabular representation. Aligning to the specific questions that our scoping review aims to answer (listed under the section above on Stage 1: Defining the Research Question), we will summarize the findings along the dimensions of (i) readmission time interval, (ii) unnecessary readmission definition, and (iii) case-mix adjustment approach used by our reviewed studies. We will follow PRISMA-ScR[25]'s guidelines for reporting these findings.

In addition to the main dimensions along which the findings will be tabulated and examined, we will conduct a thematic analysis of prevalent trends in study characteristics across our reviewed studies. CW and BK will independently review the extracted data to identify emergent codes representative of the nature of the study design and key findings. Constant comparison combined with consensus-building discussions[35] will be used to finalize the list of emergent codes and their definitions. We will identify overarching themes based on reviewing the data associated with each code, and supplement delineation of the themes using relevant numerical trends from the data for additional context (e.g., proportion of studies conducted within an integrated care system context).

Stage 6: Consultation process and engagement of knowledge users

Keeping in mind the initial motivation for our scoping review to inform future research to implement evidence-based inpatient-to-outpatient transition models into mental health care systems, we will closely engage our multidisciplinary research colleagues and partnered health care system representatives for each of Stages 1 through 5 above. These individuals have clinical and administrative expertise in mental health care delivery and their system-wide organization, including front-line practitioners, leadership of local, regional, and national care networks, and health services researchers with expertise in care transitions and admissions data. They have already played a key role in helping us understand the current status of readmissions measurement and formulating the questions that our scoping review will focus on answering. We plan to seek ongoing consultation from these individuals, to help ensure relevant contextualization of our review efforts.

Patient and public involvement

To ensure that patient perspectives are fully incorporated into every step of our planned scoping review, our consultants include patient representatives who will actively shape the research team's consensus, methods refinement, interpretation of findings, and subsequent research planning. These representatives came to be involved with our work through the first author's research center [Center for Healthcare Organization and Implementation Research (CHOIR), a Department of Veterans Affairs Health Services Research & Development Center of Innovation]'s established Veterans Engagement Research Group (VERG). VERG is a CHOIR-based community that is explicitly chartered to engage veterans and their family members as active partners in research through communication regarding opportunities to be involved, co-development of research ideas, and collaboration on tasks. VERG's

quarterly meetings will serve as a key forum through which we will regularly share our progress and receive additional timely feedback.

Anticipated timeline of research activities

Our anticipated timeline for the research activities outlined above is provided in the Gantt chart below.

	Research month							
Research activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Stage 1: Defining the research question (completed)								
Stage 2: Identifying relevant literature	X							
Stage 3: Study selection	X	X	X					
Stage 4: Data extraction			X	X	X	X		
Stage 5: Collating, summarizing, and reporting the results						X	X	X
Stage 6: Consultation process & engagement of knowledge users	X	X	X	X	X	X	X	X
Patient and public involvement	X	X	X	X	X	X	X	X

ANTICIPATED LIMITATIONS AND STRENGTHS OF SCOPING REVIEW FINDINGS

This scoping review plans a comprehensive search of how unnecessary psychiatric readmissions are measured, including both intervention and non-intervention studies that are conducted in the context of care transitions. We will closely follow Levac and colleagues' established methodological framework for conducting scoping reviews, adhering to the PRISMA-ScR[25] for reporting on the specific review steps.

This review does not aim to assess the effectiveness of approaches used by the included studies, and in turn will not assess the methodological quality of the included studies beyond specifically examining how they measure unnecessary psychiatric readmissions. This aligns with the purpose of conducting scoping reviews, which are not intended for synthesizing knowledge on effectiveness and rather intended for identifying current gaps in knowledge and establishing a new research agenda.[36]

There may exist other ways of measuring unnecessary psychiatric readmissions that have not been published as peer-reviewed journal articles that are indexed by the databases included in our review. As we allow findings from this scoping review to form an essential knowledge base upon which to build future designs, implementations, and evaluations of care transition interventions from inpatient to outpatient mental health settings, we will remain strongly engaged with our multidisciplinary research colleagues, partnered health care system representatives, and patient collaborators (mentioned in the sections above on Stage 6: Consultation Process and Engagement of Knowledge Users and Patient and Public Involvement). This will help ensure that we incorporate into our next research steps their experiences with measurement practices and other practical considerations, beyond knowledge generated from our review.

ETHICS AND DISSEMINATION

This review, to our knowledge, is the first to focus on comprehensively outlining the landscape of how unnecessary psychiatric readmissions are defined for measurement. There is no need to seek informed consent for study approval, given that no human research participants are involved. Specifically, our engagement with patient stakeholders are as research collaborators, rather than their involvement being as research subjects. Thus, informed consent, anonymity, and ethics approval from our institutions are not applicable.

This work will be conducted at a time of heightened interest by many health care systems in devising high quality practices that structure their care processes toward effectively coordinating inpatient-to-outpatient transitions.[37, 38] Particularly for public sector organizations with substantial commitments to delivering mental health care, findings from our review will support their careful examination of alternative potential transitional interventions, helping to ensure that their often limited quality enhancement resources[39] are put to optimal use.

We will share findings from this scoping review with the scientific community through peer-reviewed journal publications and presentations at national conferences. We will additionally focus on disseminating our findings to the larger health care community through both existing communication infrastructures (e.g., VERG, described in the section above on Patient and Public Involvement) and newly formed connections with health system stakeholders that our multidisciplinary consultants (please see the section above on Stage 6: Consultation Process and Engagement of Knowledge Users) will help foster. Importantly, this close communication with stakeholders will help shape our subsequent research agenda to ensure that it is appropriate and feasible, maximizing the potential for real-world health system impact.

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Author contributions: BK and CW developed the scoping review protocol, with close guidance from EKP on the review's conceptualization. CW led the development of the search strategy and refined the data extraction domains together with BK and CBW. BK led the preparation of the manuscript draft, and CW, CBW, and EKP provided critical revisions to the manuscript's intellectual content. All authors read and approved the final manuscript.

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Competing interests: The authors declare that they have no competing interests.

Data availability statement: There are no data in this work.

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Supplementary File 1

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Reported on Page #
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	10
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	10
Sponsor	5b	Provide name for the review funder and/or sponsor	N/A
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	3-4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4-5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	5-6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	5
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	5
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6

Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	6
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	6-7
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	8
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	N/A for scoping review
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	8
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	8
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	8
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	N/A for scoping review
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	N/A for scoping review

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

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Supplementary File 2

Medline (Ovid) search strategy

Search term/line number	Conceptual term of interest	Search term entered into Ovid-Medline	Number of hits
1	Mental disorders	psychiatric.ti. OR “mental disorder".ti. OR "mental disorders".ti. OR "mental illness".ti. OR "mentally ill".ti.	83986
2	Inpatient psychiatric settings	Exp "Psychiatric hospitals"/ OR Exp "hospital Psychiatric Department"/ OR "Psychiatric treatment center".mp. OR "Psychiatric Hospital".mp. OR "psychiatric unit".mp. OR "psychiatric units".mp. OR "Mental Institution".mp. OR "Mental Hospital".mp. OR "Psychiatric Department".mp. OR "Psychiatric treatment centers".mp. OR "Psychiatric Hospitals".mp. OR "Mental Institutions".mp. OR "Mental Hospitals".mp. OR "Psychiatric Departments".mp. OR "Psychiatric Ward".mp. OR"psychiatric inpatient".mp. OR "psychiatric inpatients".mp.	41507
3	Inpatient psychiatric admission	"psychiatric hospitalization".mp. OR "psychiatric hospitalizations".mp. OR "psychiatric readmission".mp. OR "psychiatric readmissions".mp. OR "psychiatric rehospitalization".mp. OR "psychiatric rehospitalizations".mp. OR "psychiatric admission".mp. OR "psychiatric admissions".mp	2905
5		1 or 2 or 3	110553
6	Patient Readmission	Exp "Patient Readmission"/	14332
7	Readmission	Readmission*.mp. OR readmitted.ti.	28315
8	Rehospitalization	Rehospitali*.mp.	5515
9	Unnecessary admissions	"Unnecessary admission".mp. OR "preventable hospitalizations".mp. OR "preventable hospitalization".mp.	315
10		6 or 7 or 8 or 9	31946
11		5 and 10	1747

Date of search run: 11 March 2019