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A NARRATIVE REVIEW OF PREDICTORS OF ADULT MENTAL HEALTH EMERGENCY DEPARTMENT RETURN VISITS AND INTERVENTIONS TO REDUCE REPEATED USE

William Kromka, MD* and Scott Simpson, MD, MPH†

*Department of Psychiatry, Brigham and Women's Hospital/Harvard Medical School, Boston, Massachusetts and †Denver Health Medical Center, Psychiatric Emergency Services, Denver, Colorado

Reprint Address: William Kromka, MD, 6495 S. Helena Street, Centennial, CO 80016

☐ **Abstract—Background: Frequent utilizers of the emergency department (ED) are a minority of patients that account for a majority of visits to psychiatric emergency services and general EDs. Objective: The primary aim of this narrative review is to synthesize the literature by describing patient characteristics correlated with adult mental health ED revisits and the efficacy of interventions for reducing frequent use. Methods: A review of the literature was performed following a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol checklist in PubMed, PsycINFO, and Google Scholar databases. Results: Thirty-one articles, mostly retrospective cohort studies, met inclusion criteria. The most commonly studied sociodemographic and clinical characteristics associated with frequent users were age, homelessness, diagnosis of schizophrenia or a substance use/abuse disorder, and receipt of current psychiatric treatment. There were 7 different categories of interventions that were studied; only 2 demonstrated a significant reduction in revisits. Conclusions: Based on the current literature, high utilization of emergency mental health care is most strongly associated with financial and economic factors. These frequent users are also typically characterized as having substance use/abuse disorders, a diagnosis of schizophrenia, and current psychiatric treatment. Though most interventions have been unsuccessful in mitigating revisits, certain ED-based interventions that modified patient care based on the acute clinical needs demonstrated a significant reduction in repeated use. Further interventions should involve modifications to care at the level of the hospital, as well as the community and follow-up care.** © 2019 Elsevier Inc. All rights reserved.

☐ **Keywords—revisit; emergency department; mental health; psychiatry; intervention**

INTRODUCTION

Emergency departments (EDs) have become a core aspect of community-based mental health care for several reasons, including accessibility, deinstitutionalization, limitations in mental health insurance coverage, diminished investment in psychiatric care, and insufficient access to care providers (1). Some patients utilize ED services at a significantly higher rate than others. Although these frequent utilizers are only a minority of patients, they account for a majority of visits to psychiatric emergency services and general EDs and produce a disproportionate financial cost to the health care system (2–4). Emergency services are certainly a necessary component of psychiatric care, yet the fact that there remains a persistent subset of heavy utilizers highlights the need for more intensive interventions for this subpopulation.

Only 19% of academic EDs in the United States have systems in place to identify frequent users of the ED for psychiatric reasons (5). For decades authors have attempted to address this challenge of identifying frequent users and mitigating their repetitious use in part by describing their associated clinical and sociodemographic characteristics. The literature regarding the characteristics of these users is heterogeneous and inconsistent. Moreover, the

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evidence supporting the various interventions used to reduce this use is also disparate (6). A previous systematic review based on 13 studies from various countries concluded that frequent users were consistently "younger men with psychotic or affective disorders, comorbidities, unemployment, and transient living accommodations" (7). We find it necessary to conduct a more contemporary and geographically focused review that includes a larger number of studies that also explores the interventions used to reduce revisits that were unaddressed in prior studies.

The primary aim of this narrative review is to synthesize this broad literature by describing patient characteristics correlated with adult mental health ED return visits and the efficacy of interventions for reducing these visits. A consolidated, accurate picture of frequent utilizers of emergency psychiatric services is necessary for improving services for this population and mitigating its impact on the health care system. This information will guide administration and development of emergency service programs, while also aiding clinicians in the acute care and disposition planning of frequent users of psychiatric emergency services.

MATERIALS AND METHODS

A narrative literature review was performed using PubMed, PsycINFO, and Google Scholar databases. PubMed and PsycINFO were searched using combinations of the key words *recidivism, emergency department, mental health, frequent user, return, visit, repeat, intervention, and psychiatric emergency services*. Google Scholar was searched for supplementary articles and other gray literature using combinations of the same key terms. The references of included studies were leveraged as additional sources during the search process as well. The review protocol followed the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) protocol checklist (8). Reporting of results followed the PRISMA statement checklist.

Inclusion criteria included publication in the English language after 1980, study location in the United States or Canada, inclusion of participants aged 18 years or older, and a focus on repeated use of the ED for mental health reasons. Exclusion criteria included publication in a language other than English, publication prior to 1980, studies located outside of the United States or Canada, inclusion of participants younger than 18 years old, and studies that did not pertain to ED revisits for mental health concerns. It was decided to exclude studies from many countries similar to the United States, such as Australia and those in Europe, due to variations in sociocultural and structural variables.

Articles were first screened for eligibility using available database filters. The abstracts and titles of the remaining articles were then screened for topical relevance and any exclusion criteria not identified by the initial database filter. The risk of bias for included interventional studies was assessed using a tool developed by Kennedy et al. that includes eight items scored individually that we then pooled together for an overall rating of "low," "medium," or "high" (9). The risk of bias for included descriptive studies was assessed using the Cochrane Tool to Assess Risk of Bias in Cohort Studies and a tool developed by the CLARITY Group for case–control studies (10,11). For all articles except for case reports and expert opinions, evidence levels were assessed using the Oxford Center for Evidence Based Medicine (OCEBM) Levels of Evidence criteria (12).

RESULTS

Figure 1 illustrates the article selection process. An initial screen identified 1802 citations, from which 1667 records were selected for additional screening. Of these, 60 articles were assessed for eligibility based on a full-text reading, resulting in the final inclusion of 31 articles. These articles were from the United States (n = 21) and Canada (n = 10) published between 1986 and 2018 with study periods ranging from 3 months to 15.5 years and sample sizes ranging from 34 to 71,611 (mean n = 5277).

The most common type of study was a retrospective cohort study (n = 24) with durations of follow-up that ranged from 1 month to 15.5 years. The purpose of these retrospective cohort studies was primarily to discern clinical and sociodemographic characteristics significantly associated with frequent utilizers of emergency services for mental health concerns. Certain studies further stratified frequent users into categories based on frequency of utilization and analyzed these groups for significant characteristic distinctions. The rest of the retrospective studies were designed to examine a specific intervention or a more specific population of patients (13–16).

All of these retrospective cohort studies were conducted in public/county or academic hospitals, typically in metropolitan and urban areas within the United States. Inclusion criteria were most commonly defined as all patients presenting specifically to psychiatric emergency services over a discrete period of time as defined by each study. However, three studies (17–19) included all patients presenting to a general ED, while three others included patients presenting to a general ED with a primary psychiatric complaint (20–22). The patient populations of these studies were generally Caucasian (18,21,23–25), male (3,17,20,22,23,25–27), and single (20,21,28). Most patients were characterized as socioeconomically disadvantaged and "at high risk of involvement with

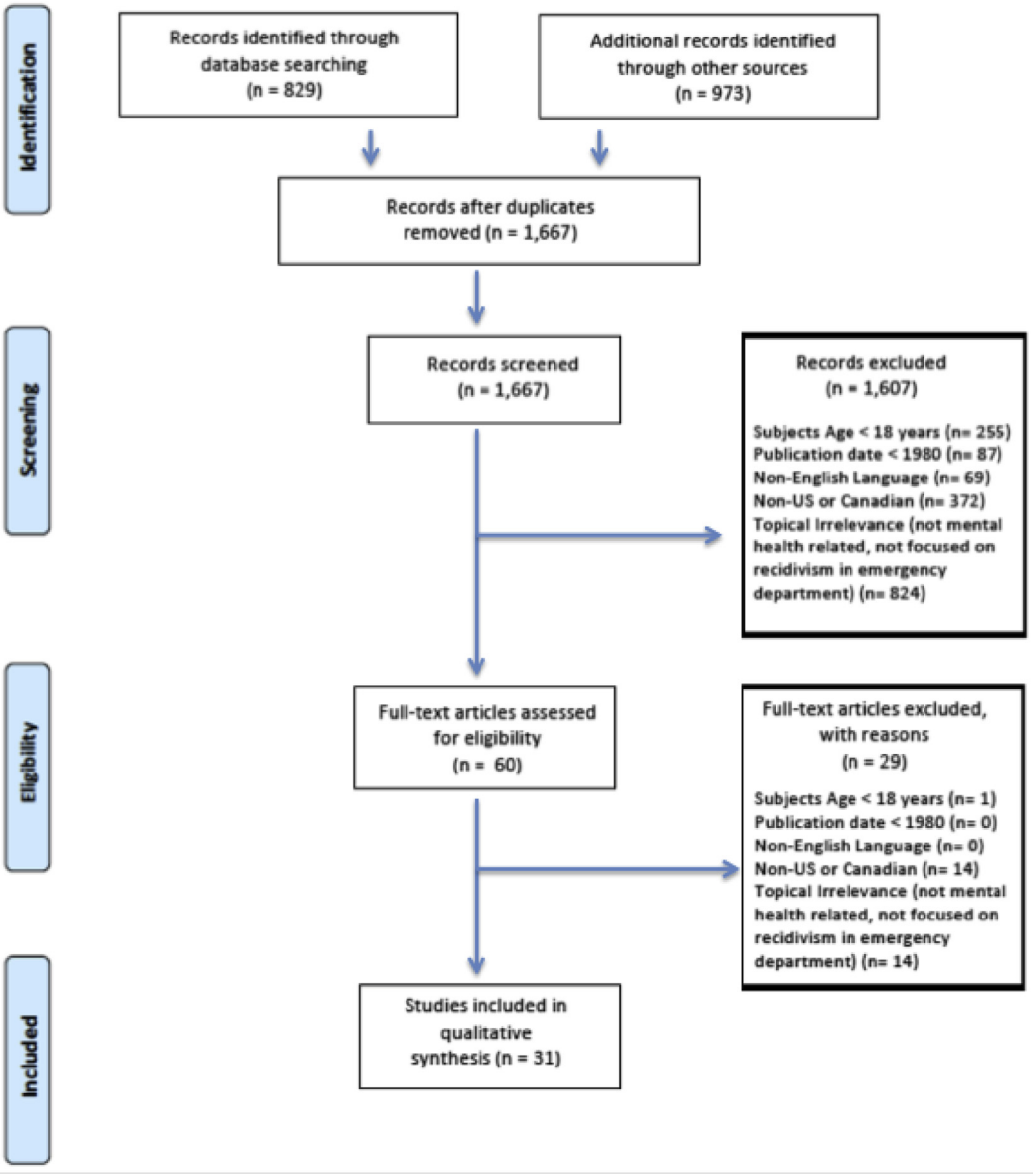

Figure 1. Selection pathway for articles included in the review.

systems of mental health and healthcare, social services, and law enforcement" (29). The remainder of the retrospective cohort studies had more specific patient populations as listed in Supplementary Table 1.

The second most common type of study used a case–control design (n = 3) to compare high utilizing patients to a control group. Similar to many of the retrospective cohort studies, two were carried out in order to determine factors more commonly associated with frequent presenters to a psychiatric emergency service (PES) and general ED for mental health complaints, respectively (30,31). The third case–control study was also intended to "identify additional risk factors" associated with frequent presenters to a PES, but additionally to "determine healthcare utilization from a system perspective" and "estimate the amount of current health care financial charges attributed to frequent visitors" (4). Two of these studies were conducted in urban metropolitan areas, whereas the other drew data from two "rural-urban" EDs (4,30,31). Of the two studies that reported quantitative data regarding the cases and controls, a majority of patients in both groups were male and had a mean age of 40 years or younger (4,31). Yet, one patient population was noted to be majority African American and have a diagnosis of psychosis (4).

Other papers included a prospective cohort study, a naturalistic observational study, a cross-sectional study, and a non-blinded parallel-group randomized controlled trial.

Supplementary Table 1 depicts these studies along with their associated OCEBM Levels of Evidence. Overall, most studies had an OCEBM Evidence Level of 2b, defined as cohort studies that do not fail to clearly define comparison groups or measure exposures and outcomes in the same way in both the exposed and non-exposed individuals (12). As demonstrated in Tables 1–3, there was an overall medium–high risk of bias across studied interventions and an overall low risk of bias across descriptive studies.

Definitions of High Utilization

The terminology used to describe an individual who visits the ED in a repetitive fashion was broad and included terms such as *frequent user*, *repeat user*, *frequent repeaters*, *high-utilizers*, *frequent presenters*, and *returnees*. Repeat patients were most commonly described using the term *frequent user* (n = 8), which was most commonly quantitatively defined as patients with 4 or more psychiatric emergency visits within a 12-month period. Supplementary Table 1 outlines the various definitions of frequent user used in each study. The terminology and definitions used to describe frequent users did not vary according to study methodology or hospital type or setting. It is of note that no Canadian studies used 6 or more emergency visits or 4 or more emergency visits to quantitatively define a frequent user, whereas those were two of the most common definitions in the United States (n = 5 for both). Moreover, the most common definition in the Canadian studies—5 or more ED visits within a 1-year period—was not used in any of the U.S. studies.

Characteristics of High-Utilizing Patients

Table 4 outlines sociodemographic and clinical characteristics studied and their association with high utilization. There were 21 different clinical characteristics and 14 different categories of sociodemographic factors examined across the studies included in this review. The most studied clinical variable was diagnosis of a substance use/abuse disorder (n = 17), which overall had 11 out of the 17 (64%) studies demonstrating an association with revisits. The other top three most studied clinical variables were diagnosis of schizophrenia (n = 11), diagnosis of other psychotic disorders (n = 9), and diagnosis of any personality disorder (n = 8). Five of the eight studies examining the association of personality disorder with revisits found that there was indeed an association between the two. Although possessing the diagnosis of schizophrenia was found to be associated with revisits in 9 out of the 11 in which it was included as a variable, patients with other psychotic disorders were only found to be associated with repeated use of mental health ED services in 3 out of the 9 studies.

Table 1. Criteria Used to Assess Risk of Bias for Interventional Studies

	Study Design			Participant Representativeness			Equivalence of Comparison Groups		
First Author	Cohort	Control or Comparison Group	Pre/Post Intervention Data	Random Assignment of Participants to the Intervention	Random Selection of Participants for Assessment	Follow-Up Rate of ⩾80%	Comparison Groups Equivalent on Sociodemographics	Comparison Groups Equivalent at Baseline on Outcome Measures	Summary of Bias Risk
Claassen (25)	Yes	Yes	Yes	No	No	Yes	Yes	NA	Low
McCullumsmith (32)	Yes	Yes	No	No	No	Yes	Yes	NA	Medium
Kislinsky (33)	Yes	Yes	Yes	No	No	Yes	Yes	NA	Low
Abello (34)	Yes	No	Yes	No	No	NR	NA	NA	Medium
Zeman (35)	Yes	No	No	No	No	NR	NR	NA	High
Nossel (36)	Yes	Yes	No	No	No	NR (lack of follow-up would bias toward null)	NR	NA	Medium
Stergiopoulos (37)	Yes	Yes	No	Yes	No	Yes	Yes	NA	Medium

Graded using the Evidence Project risk of bias tool (pmid: 30606262).
NA = not applicable; NR = not reported.

Table 2. Criteria Used to Assess Risk of Bias for Descriptive Cohort Studies

First Author	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Overall
Brennan (18)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Chaput (3)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Probably yes	Probably yes	Definitely yes	NA	Low
Lam (17)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Arfken (38)	Definitely yes	Probably yes	Probably yes	Mostly no	Probably yes	Probably yes	Probably no	NA	Medium
Urbanoski (19)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Ngamini-Ngui (15)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Pasic (23)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Sullivan (39)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Probably yes	Definitely yes	NA	Low-Medium
McNiel (24)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Probably yes	NA	Low
Hansen (14)	Definitely yes	Definitely yes	Definitely yes	Mostly no	Definitely yes	Definitely yes	Definitely yes	NA	Medium
Kolbasovsky (13)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Probably yes	NA	Low
Perez (16)	Definitely yes	Probably yes	Definitely yes	Mostly no	Probably yes	Definitely yes	Probably yes	NA	Medium
Oyewumi (28)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Probably yes	Definitely yes	Probably yes	NA	Low-Medium
Buhumaid (22)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Segal (26)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Klinkenberg (20)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Dhossche (27)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Probably yes	NA	Low
Chang (21)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Definitely yes	Definitely yes	Definitely yes	NA	Low
Meng (40)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Probably yes	Definitely yes	Definitely yes	NA	Low
Morris (41)	Definitely yes	Definitely yes	Definitely yes	Mostly yes	Probably yes	Definitely yes	Probably yes	NA	Low-Medium

Criteria 1: Was selection of exposed and non-exposed cohorts drawn from the same population?
Criteria 2: Can we be confident in the assessment of exposure?
Criteria 3: Can we be confident that the outcome of interest was not present at start of study?
Criteria 4: Did the study match exposed and unexposed for all variables that are associated with the outcome of interest or did the statistical analysis adjust for these prognostic variables?
Criteria 5: Can we be confident in the assessment of the presence or absence of prognostic factors?
Criteria 6: Can we be confident in the assessment of outcome?
Criteria 7: Was the follow-up of cohorts adequate?
Criteria 8: Were co-interventions similar between groups?

Among the most studied sociodemographic variables, homelessness (n = 10) was the variable most frequently associated with revisits (9 out of 10 studies), while age, the most commonly studied sociodemographic variable (n = 18), was only found to be associated in 44% (8 out of 18) of the studies. Gender, the second most commonly studied sociodemographic variable (n = 17), was found to have no association with revisits in 58% (7 of 17) of the studies. The variable of patient race (n = 10) also had a majority of studies, 6 out of 10 (60%), concluding that there was no significant association with revisits. There were 9 other clinical and 7 other sociodemographic variables that were less frequently studied, but overall still had a majority of studies concluding a significant association with frequent ED use for mental health concerns, as demonstrated in Table 4. It was decided to forego any pooled estimates of the odds of association between these specific predictors and psychiatric ED visits due to highly varied study settings, follow-up periods, and definitions of frequent utilization in the descriptive studies. The

Table 3. Criteria Used to Assess Risk of Bias for Descriptive Case–Control Studies

First Author	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Overall Assessment
Vandyk (31)	Definitely yes	Definitely yes	Definitely yes	Definitely yes	Probably yes	Low
Arfken (4)	Probably yes	Definitely yes	Definitely yes	Definitely yes	Probably yes	Low
Ellison (30)	Definitely yes	Definitely yes	Definitely yes	Definitely yes	Probably yes	Low

Criteria 1: Can we be confident in the assessment of exposure?
Criteria 2: Can we be confident that cases had developed the outcome of interest and controls had not?
Criteria 3: Were the cases (those who were exposed and developed the outcome of interest) properly selected?
Criteria 4: Were the controls (those who were exposed and did not develop the outcome of interest) properly selected?
Criteria 5: Were cases and controls matched according to important prognostic variables or was statistical adjustment carried out for those variables?

Table 4. All Clinical and Sociodemographic Characteristics Examined in the Included Studies

Characteristic of Frequent User	Predictive of Revisits (No. of Studies)	No Significant Association (No. of Studies)	Total No. of Studies Addressing Variable	% of Studies Demonstrating Association With Revisits
Clinical				
Diagnosis of substance use/abuse disorder	11	6	17	65
Drug or alcohol intoxication at index visit	2	0	2	100
Diagnosis of schizophrenia	9	2	11	82
Diagnosis of psychotic disorder (other than schizophrenia)	3	6	9	33
Psychotic symptoms at index	2	2	4	50
Diagnosis of any personality disorder	5	3	8	63
Diagnosis of borderline personality disorder	2	0	2	100
Diagnosis of a mood disorder	2	1	3	67
Diagnosis of depression	1	2	3	33
Diagnosis of bipolar	1	2	3	33
Diagnosis of Anxiety	1	6	7	14
Diagnosis of adjustment disorder	2	4	6	33
Admitted at index visit	4	2	6	67
Previous psychiatric hospitalization	6	0	6	100
Current psychiatric treatment	4	3	7	57
Prescribed psychotropic medication	2	0	2	100
Need for medication as reason for seeking care	1	1	2	50
Dangerous/violent behavior (safety to self/others)*	5	0	5	100
Chronic medical problems/ comorbidities	5	1	6	83
Chief complaint	0	2	2	0
Diagnosis of dementia	1	1	2	50
Sociodemographic				
Sex/gender	7	10	17	41
Age	8	10	18	44
Race	4	6	10	40
Marital status	3	3	6	50
Unemployment	8	1	9	89
Homelessness	9	1	10	90
Having any insurance	1	1	2	50
Having public insurance (Medicaid, Medicare, or other)	4	0	4	100
Uninsured	2	0	2	100
Financial instability†	4	1	5	80
Self-referred	2	0	2	100
Level of education	0	2	2	0
Unreliable social support	4	0	4	100
Problems with criminal justice system	2	1	3	67

The far right column lists the total number of articles in which the specified variable was included, whereas the preceding two columns break down the number of articles within that total amount demonstrating a significant association with revisits vs. no significant association.

* Dangerous/violent behavior refers to patients presenting with hostility, violent behaviors, self-harm, suicidality, or homicidality that makes them a danger to themselves or others.

† Financial instability includes circumstances in which the patient's income is limited, none, or dependent on welfare or social assistance.

investigators felt that combining odds ratios across all of these studies would be somewhat misleading, although there were clearly trends meriting narrative description.

Interventions to Reduce Recidivism

There were seven different categories of interventions that were studied with various outcome variables as described in Table 5. These interventions can be broadly divided into those primarily involving modifications to care at the initial ED visit (n = 2) and those based on changes to follow-up and outpatient care after ED discharge (n = 5).

Two ED-based interventions demonstrated effectiveness in reducing utilization (34,35). The focused medication management developed by Zeman et al.

Table 5. Studies From Current Literature Examining Particular Interventions to Reduce Mental Health Emergency Department Revisits

First Author	Study Design	Sample Size	Population	Setting	Description of Intervention	Outcomes Variables and Results
Zeman (35)	Retrospective cohort	None listed	All patients presenting to PES	Primary PES in urban Detroit	Focused medication management in the PES (brief assessment by a nurse and medication management by a psychiatrist)	Patient and clinician satisfaction Patients and PES clinicians satisfied; community providers less satisfied No. of patients needing hospitalization Decreased No. of PES visits in 1 year No significant increase Yearly rate of seeking care at outpatient clinics Increased from a median of .96 per year to 5.40 per year
Abello (34)	Retrospective cohort	48	Patients admitted to the HAP between dates of 11/2006 and 10/31/2007 with psychiatric International Classification Diseases, Ninth Revision, codes (290–312) excluding those with childhood developmental or mental retardation disorders	EDs of three central Texas hospitals	High Alert Program (HAP) Identifies patients with a history of excessive use of the ED, particular medical issues of concern, dangerous behavior toward self or others while on hospital property, or other problematic behavior that requires tailored care Care plans (categorized into four levels) are generated and discussed with the patients on their next ED visit by the nurse and case manager	No. of ED visits over 2 years Significant reduction in ED visits for: high-users, uninsured, females, the non-homeless Nonsignificant reduction for homeless patients and male patients
Stergiopoulos (37)	Non-blinded parallel-group randomized controlled trial	166	Adults 18 years of age or older with five or more ED visits in the past 12 months, with at least one visit for mental health or addictions problems	Six academic EDs in Toronto	Coordinated Access to Care from Hospital EDs (CATCH-ED) Brief intensive case management (4–6 months) for frequent users	Primary: ED utilization over 12 months No significant reduction in ED visits Secondary: Days in hospital, Physical and mental health status, alcohol and drug use No significant change in any of the secondary measures
Nossel (36)	Prospective cohort	1167	Frequent users (three or more ED visits in the prior year) of Columbia University Medical Center's psychiatric emergency service	PES at Columbia University Medical Center	Project Connect Critical Time Intervention modeled care coordination involving peer specialists	No. of PES visits No overall significant decrease No. of inpatient hospitalizations No overall significant decrease Use of outpatient mental health services Significant increase
Claassen (25)	Retrospective cohort	37,371	Patients visiting a hospital-based PES in Dallas, TX	PES in Dallas County, TX	NorthSTAR A regional system of managed mental health care A blended-funding, integrated, behavioral health carve-out that eliminates the separation of treatment silos for substance abuse and mental health treatment	PES revisit rate No significant difference in PES visit rate after the first week of managed care

(*Continued*)

Table 5. Continued

First Author	Study Design	Sample Size	Population	Setting	Description of Intervention	Outcomes Variables and Results
Kislinsky (33)	Retrospective cohort	57	Patients with a mental illness who had been admitted to an acute care mental health inpatient program	Hospitals in Ontario, Canada	Connection to a mental health outpatient program	30-day return rate to ED No significant difference 30-day return rate to an inpatient unit No significant difference Length of time before returning to the ED Subjects offered rapid follow-up (TPC appointment within 3 days of index visit) had a significant delay in returning to the ED for psychiatric, but not medical, crisis.
McCullumsmith (32)	Retrospective cohort	390	Patients referred for care to the TPC at UAB from 2009 to 2011.	UAB TPC	TPC Met for 2 half days per week and time slots were scheduled for follow-up only, focusing on specific issues of concern in the ED visit. Designed to bridge the patient to an appropriate permanent follow-up.	

ED = emergency department; PES = psychiatric emergency service; TPC = transitional psychiatric clinic; UAB = University of Alabama Birmingham.

was instituted as an alternative to the usual comprehensive care provided to all patients that entered a PES (35). Rather than providing extensive services to every patient, Zeman et al.'s intervention involved targeting patients who were presenting to a primary psychiatric emergency service in Detroit and employing a brief assessment by a nurse and medication management by a psychiatrist. Through analysis of claims data and surveys of the PES staff and community providers, they found that patients not only "increased their rate of seeking care at outpatient clinics (from a median of .96 per year to 5.40 per year)," but also did not demonstrate any significant increase in the rate of visits to the psychiatric emergency service" (35). Abello's High Alert Program built a "care plan database" that identified particular high-risk patients and generated a care plan for them based on their presentation (34). This care plan was then integrated into the patient's electronic medical record and serves as a flag for future providers. The cohort of patients who received this care plan was found to have a significant "reduction in ED visits," but also "an increase in psychiatric admissions and no significant change in community clinic visits" (34).

The remaining interventions were designed to encourage outpatient follow-up. Stergiopoulos et al. and Nossel et al. implemented interventions involving intensified case management focused toward frequent ED users with mental health concerns (37,36). Stergiopoulos et al.'s CATCH-ED trial, a non-blinded parallel-group randomized controlled trial, assigned frequent utilizer patients at six Toronto hospitals to case managers who worked with participants over 4–6 months to "foster engagement and identify needs and goals, secondly to connect participants to needed community-based services, and transition and transfer participant care to longer-term community services" (37). Both this case management intervention and Nossel et al.'s "Project Connect" were informed by the Critical Time Intervention (CTI) model. Nossel et al. adapted CTI for frequent users of Columbia University Medical Center's psychiatric ED. Case management in this intervention was undertaken by "full-time peer CTI specialists" who were individuals who "had experienced mental illness, substance abuse, or homelessness themselves" and had extensive case management and CTI experience (36). These peer specialists followed up with patients in the community in order to "identify reasons for repeated ER use, obtain ongoing mental health and substance abuse treatment, insurance, entitlements, housing, and vocational training, and facilitate reconnections with social supports" (36). Neither Nossel et al. nor Stergiopoulos et al.'s interventions achieved a statistically significant reduction in emergency service use.

A more broad and systems-based approach to encourage outpatient adherence in lieu of ED utilization was examined by Claassen et al. in their study of a regional system of managed mental health care in seven North Texas counties called NorthSTAR (25). This system of behavioral managed health care is described as a "blended-funding, integrated, behavioral health carve-out that eliminates the separation of treatment silos for substance abuse and mental health treatment" (25). By functioning as a Medicaid waiver program and "flat-fee reimbursement program for the medically indigent" that gives frequently utilizing and indigent patients expanded choices of providers, NorthSTAR aimed to "improv[e] access for all covered patients—for example eliminating long wait times before treatment enrollment" (25). Although the investigators found that there was a statistically significant decrease in ED visit rates among patients involved in NorthSTAR during the first 5 weeks, this reduction did not extend past that point, suggesting that the managed care system "merely delayed, rather than prevented, return visits to the psychiatric emergency service" (25). Similarly, in a separate study examining repeated ED use for psychiatric patients in Ontario, there was no difference in 30-day readmission rates between patients connected to an outpatient mental health program after their index visit and those who were not (33).

Lastly, McCullumsmith et al. examined the effects of a transitional psychiatry clinic (TPC) that was established for patients without follow-up in the 2 weeks following discharge that were "deemed to require hospitalization if they could not be seen in two weeks time" but did not require "imminent hospitalization" (32). One of McCullumsmith et al.'s primary outcome measures was the number of return ED visits over 9 months following the initial ED visit in psychiatry crisis. The goal of the TPC was to ultimately bridge patients to permanent follow-up, but patients could be seen by the TPC for up to 3 months. Patients referred to the TPC had an average of 1.3 psychiatric ED visits in the year prior and had a high prevalence of substance abuse. It was found that patients who had a TPC appointment within 3 days of their index ED visit had a significant delay in their ED return time (129.7 days) compared to those whose appointment was 4–14 days from their index visit (64 days). Patients with psychotic disorders, personality disorders, and increased number of ED visits in the year prior were found to be significantly predictive of a return to the ED within 9 months of the index visit. Thus, although more rapid follow-up with the TPC was found to prolong ED revisits, the TPC itself did not altogether reduce the repeated utilization.

DISCUSSION

This review found that there are certain core characteristics associated with frequent users, but few interventions that successfully mitigate this repeated utilization. The findings of this paper have implications for administration, service programming, and acute management of patients presenting to the ED in psychiatric crisis.

Regardless of the parameter used to specifically define frequent use, several general sociodemographic and clinical characteristics appear consistently associated with ED revisits for psychiatric care. The fact that homelessness, unemployment, having public insurance, and financial instability were some of the most frequently associated variables suggests that ED revisits are less likely tied to social factors and more so driven by economic circumstances; these factors may be more resistant to interventions delivered in the clinical setting. Furthermore, the clinical variables of substance abuse disorder, diagnosis of schizophrenia or any personality disorder, and previous psychiatric hospitalization were found to be the most robustly studied and frequently predictive of revisits. Underpinning each of these disorders is a pattern of chronic and severe pathology. The consistent finding that these characteristics are associated with revisits suggests that successful interventions need to ameliorate barriers to treatment common among these populations, including providing access to long-acting injectable antipsychotic medication for patients with schizophrenia or opioid substitution treatment for patients with opioid use disorders.

The two interventions producing statistically significant reductions in return visits both involved tailoring care within the ED more specifically to the individual patient's clinical needs. Our findings suggest that future strategies utilizing the development of specified clinical pathways, such as the successful medication management program and High Alert Program, have promise to produce lasting reductions in psychiatric ED use. These acute ED-based interventions address the substantial clinical component of ED revisits and have promise to produce even more significant results when paired with optimization of certain social barriers, such as housing, proximity to follow-up, and immediate financial stability.

However, this review demonstrated that most interventions have had minimal efficacy in reducing ED revisits for mental health concerns. These results are consistent with previous systematic reviews and meta-analyses concluding that case management is the most studied intervention but largely ineffective in reducing psychiatric revisits to the ED (42,43). Our review highlights the wide variety of ways in which case management is

implemented as well as certain systems-based limitations, such as availability and accessibility of care. It was also shown that the success of case management interventions was often population-specific and curtailed by unmet medical and psychiatric needs. This heterogeneity of interventions and service settings along with the fact that only a limited number of high-quality studies of case management for patients with mental health conditions included the outcome of ED visits suggests that not all case management-based interventions can be discounted offhand (43). Likely, effective case management should be preceded or paralleled by maximization of the patient's baseline medical and psychiatric status and target the specific unmet socioeconomic needs of patients rather employ a broad model of care coordination.

Two general trends emerged when qualitatively and quantitatively defining return visits, frequent use, and high utilization. In the both the U.S. and Canada, the term *frequent user* was most commonly employed to describe repeat patients, and they were most often quantitatively defined by 4 or more ED visits (United States) or 5 or more visits (Canada) for mental health reasons, typically within a 12-month period either prior to the index visit or during the study period. The present review identified slightly different trends based on a larger number of studies than Vandyk et al.'s review that identified "4+ visits/1 year and 6+ visits/1 year" as the most frequently encountered parameters (7). It appears that 4–5 ED visits per year can be used as a general benchmark for planning, with flexibility based on setting, duration, follow-up, and patient volume.

Limitations

Limitations to this review include the potential of pertinent studies being missed or excluded during the initial literature search. In order to mitigate this limitation, a detailed review protocol following the PRISMA protocol checklist was applied a priori. Also, this review was focused specifically on studies conducted in the United States and Canada. Inclusion of studies from other countries could have potentially shifted the results, although significant differences in health care distribution, policy, and access among countries may have limited our findings for clinicians and administrators.

Additionally, our assessment of the risk of bias of the included interventional studies concluded an overall medium-high risk of bias largely derived from a lack of randomization and failure to report follow-up rates and sociodemographic equivalences between groups. Despite most studies not comprehensively matching the exposed and unexposed groups for variables associated with outcomes of interest, the descriptive studies were assessed to have an overall low risk of bias.

CONCLUSIONS

Frequent use of the ED for mental health reasons is a complex phenomenon driven by the patient's clinical condition, social circumstances, and available health systems. Studies suggest that high utilizers of emergency mental health resources are most frequently associated with homelessness and general financial instability along with having previous psychiatric hospitalizations, a diagnosis of schizophrenia or any personality disorder, and current psychiatric treatment. Though interventions up to this point have been meager in their reductions of revisits, future efforts that are multifaceted and targeted toward these marginalized individuals have a potential to provide meaningful and lasting improvements in these patients' care and subsequent reductions in ED revisits for mental health concerns.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jemermed.2019.08.005.

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ARTICLE SUMMARY

1. Why is this topic important?

High utilizers of emergency services for mental health needs are a sub-population of patients that produce a disproportionately large financial and resource burden on the health care system. In order to successfully mitigate this impact on the health care system and improve these patients' care, it is integral to understand what characterizes this patient population and investigate the interventions that have already been employed to reduce repeated use.

2. What does this review attempt to show?

This review attempts to demonstrate the clinical and sociodemographic characteristics associated with frequent users of the emergency department (ED) for mental health concerns and examine the interventions that have been employed to reduce this repeated use.

3. What are the key findings?

One of the key findings of this review is that only two ED-based interventions that modified patient care based on the patient's acute clinical needs were successful in significantly reducing revisits. The other key findings of this review include financial and economic circumstances being the sociodemographic variables most commonly associated with revisits along with clinical variables of substance abuse disorder, diagnosis of schizophrenia or any personality disorder, and previous psychiatric hospitalization.

4. How is patient care impacted?

This review provides a framework for physicians to improve the acute management of these frequent users, guide their disposition planning, and develop novel strategies to reduce high utilization, which will in turn improve the quality of life for this sub-population of patients.