THE NEED FOR IMPROVING ACCESS TO INTEGRATED HEALTH SERVICES AND THE

ELIMINATION OF TOBACCO CULTURE WITHIN SUBSTANCE USE DEPENDENCY

TREATMENT

A Dissertation

by

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ABSTRACT

The literature reviewing comorbid physical and behavioral health disorders

indicates a need for examining access and treatment strategies for improving health

outcomes.

Via umbrella review, this dissertation demonstrates that there was substantial

variation between and within models regarding treatment type, length, frequency,

exposure time, delivery and setting, technology employed, type and number of

healthcare providers, targeted health outcome, and interactions between intervention

components of integrated care models employed within the United States (US). Overall,

collaborative care appeared to have the greatest efficacy in improving health outcomes,

although evidence was mostly limited to depression and depression-related symptoms.

Additionally, this dissertation reviewed access to integrated care services within

different types of substance use dependency treatment (SUDt) facilities across the US

between 2014 and 2017. There was significant variability between type and number of

integrated care services offered at each type of SUDt facility. Overall, there were higher

rates of facilities not offering any service compared to offering one or more services

across all survey years, with nearly half not offering any integrated care service at all

and little noticeable change over time.

Finally, this dissertation used access to nicotine addiction support services

(NASS) as a proxy indicator for organization tobacco culture by demonstrating: 1) a pro-

tobacco use culture does exist within SUDt, 2) facilities that do not ban tobacco use are

less likely to offer NASS, and 3) the likelihood of facilities having a campus-wide tobacco ban increases with the number of NASS offered at those facilities.

This dissertation also provides evidence-based recommendations such as removing organization-level obstacles, providing open and thorough two-way communication with staff, standardizing tobacco addiction therapy as part of SUDt, denormalizing tobacco use within the organization, and both focusing on and providing the necessary resources for staff to promote an effective transition to a tobacco-free culture.

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NOMENCLATURE

BI	Brief interventions
CC	Collaborative Care
CHD	Coronary heart disease
CL	Consultation liaison
CMHC	Community Mental Health Centers
DEC	Diet and exercise counseling
ED	Emergency Care
CBT	Cognitive behavioral therapy
CDM	Chronic disease management
COPD	Chronic Obstructive Pulmonary Disease
IPC	Integrated primary care
MI	Motivational Interviewing
MSMH	Multi-setting mental health facilities
NASS	Nicotine addiction support services
NLSM	Nurse-led self-management
NMHSS	National Mental Health Services Survey
NRT	Nicotine replacement therapy
NTCM	Non-nicotine tobacco cessation medication [by prescription]
OP	Outpatient mental health facilities
PC	Primary Care

PCMH	Patient-centered Medical Home
PHP	Partial hospitalization/day treatment
PST	Problem-solving therapy
SAMHSA	Substance Abuse and Mental Health Services Administration
SBI	Screening and brief intervention
SCT	Social cognitive theory
SIPUGH	Separate inpatient psychiatric unit of general hospital
SUD	Substance use dependency
SUDt	Substance use dependency treatment
TCC	Tobacco cessation counseling
TM	Transtheoretical model
VAMC	Veterans Administration Medical Centers

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CHAPTER I

INTRODUCTION

According to the National Survey on Drug Use and Health (NSDUH) in 2017, 22.7% of adults reported having a behavioral health disorder, of which 31.7% of them had a substance use dependency (SUD) disorder, and only 21% of those with a SUD actually attended SUD treatment (SUDt) within the past year (SAMHSA, 2017a). In 2017, the National Institute on Drug Abuse (NIDA) estimated the cost of healthcare for substance abuse (alcohol, tobacco, illicit drugs, and prescription opioid use) was approximately $246 billion a year (NIDA, 2017) and data suggest that nearly 85% of healthcare spending for individuals with behavioral health disorders is specifically for their physical health comorbidities (Thorpe, Jain, & Joski, 2017) such as cardiovascular disease and diabetes (Prince et al., 2007).

This illustrates an economic and social need for improving both the physical and behavioral health outcomes for individuals with SUD disorders. However, providing treatment for this population has proven be a challenge within the healthcare setting due to a variety of barriers ranging from mental healthcare stigmas (Edmond et al., 2016; Stuart et al., 2017), lack of provider training in behavioral health (V. Lewis et al., 2014; Rieckmann et al., 2017), poor behavioral health screening (Agley et al., 2014; McLellan & Woodworth, 2014; Minkoff & Gordon, 2016; Saitz et al., 2013), and financial issues (Maclean & Saloner, 2018).

The objective of this dissertation is to examine opportunity for improving the health status and treatment outcomes for patients with SUD disorders. This dissertation consists of three studies (chapters two, three, and four) with individual contributions by each study to meet this objective.

The purpose of the first study (chapter two) is to provide an overview and literature review of the behavioral health interventions currently practiced at healthcare entry points within the United States. This study examines opportunities of integrated care practices that could be adopted by healthcare professionals and organizations. Study one uses an umbrella review approach aimed to present a broad overview of the range of models for integrated healthcare approaches and their effectiveness across healthcare settings. In this study, integrated healthcare is defined as care that includes any treatment approach in healthcare settings that combine behavioral health care with physical health care with the intention to obtain greater behavioral and physical health outcomes. This review explores two questions: 1) What are the current integrated healthcare approaches and models employed within primary care, specialty care, inpatient care, and emergency care settings? and 2) In regard to healthcare cost and patient health outcomes, what is the effectiveness of these approaches/models within these four settings?

Many of the barriers mentioned above are not present at SUDt facilities and therefore could potentially make SUDt facilities ideal for integrated health care practices. The purpose of the second study (chapter three) is to focus on SUDt facilities and the access patients have to integrated care while receiving SUDt. Study two examines and compares the rates of access to integrated healthcare services at various

types of SUDt facilities from 2014 to 2017. More specifically, study two hypothesizes that differences in rates of access to three types of integrated physical healthcare services (e.g. chronic disease management, integrative primary care services, and diet/exercise counseling) between different types of SUDt facilities have not changed from 2014-2017 and thus represents a valuable opportunity for improving health and treatment outcomes for these patients.

Continuing to focus on SUDt, study three (chapter four) examines opportunity through a different lens. Instead of examining integrated care as an opportunity to improve health and treatment outcomes, study three examines the prevalence of tobacco culture and nicotine addiction support services (NASS) at SUDt facilities across the US. The purpose of this study was to examine the relationship between the tobacco use culture in treatment facilities and availability of NASS. Access to NASS (e.g. tobacco cessation counseling, nicotine replacement therapy, and non-nicotine tobacco cessation medication [by prescription]) was used as a proxy indicator for tobacco culture, varied with tobacco bans within SUDt facilities, and a relationship of tobacco culture and the prevalence of NASS between different types of SUDt facilities appeared to be present.

Each of these studies provide evidence of different opportunities for improving health and treatment outcomes for patients with substance use dependency disorders. Individually, they examine access to integrated care at healthcare entry points and SUDt facilities, as well as identify and emphasize a major barrier to successful SUDt outcomes. As a whole, this dissertation provides actionable starting points for healthcare

professionals and organizations interested in improving health and treatment outcomes

for these patients.

CHAPTER II

INTEGRATED CARE MODELS IN HEALTHCARE – AN UMBRELLA REVIEW

Introduction

Nearly 68% of individuals with behavioral health conditions (e.g. clinical depression and substance use dependency disorders) (Matarazzo, 1980) have comorbid physical health conditions (Minkoff & Gordon, 2016) and these individuals are associated with greater utilization and overall cost of healthcare (Freeman et al., 2014). Data suggest that nearly 85% of healthcare spending for these individuals is specifically for their physical health comorbidities (Thorpe et al., 2017), such as cardiovascular disease and diabetes (Prince et al., 2007). Healthcare spending alone from 2010-2013 averaged $672.4 billion for this population (Thorpe et al., 2017). By contrast, total healthcare spending in 2013 for Medicaid, Medicare, and private insurance between all patient populations was $1.7 trillion (Minkoff & Gordon, 2016).

Reasons for the higher healthcare costs for individuals with behavioral health comorbidities include higher rates of chronic health conditions, higher rates of recidivism/readmissions, higher rates of risky health behaviors, poor adherence to treatment, poorer communication with providers, poorer access to healthcare, behavioral health stigmas associated with receiving health care, and poor behavioral health treatment outcomes. (D. Brown & McGinnis, 2014; Clark et al., 2016; Freeman et al., 2014; Glass et al., 2015; Jiang et al., 2016; Mark et al., 2013; M. Smith, Stocks, & Santora, 2015; Trudnak et al., 2014)

To address the elevated costs and poor health outcomes associated with populations with multiple health comorbidities, more attention has been given to developing and providing greater integrated care at healthcare provider locations. There is no consensus on the exact definition of integrated care, and definitions range from behavioral health treatment working within and as part of primary care (PC) (Collins et al., 2010) to a systematic and cost-effective approach for providing patient-centered care through the collaboration between physical and behavioral health care providers (Raney, 2017). Many approaches that meet such definitions are not isolated to primary care settings and have been practiced in other healthcare settings such as specialty care, emergency care, and inpatient care. As such, this review uses a broader definition of integrated care to include any treatment approach in healthcare settings that combine both behavioral health care and physical health care with the intention to obtain better behavioral and physical health outcomes. Such integrated healthcare models include, but are not limited to: Alternative Quality Contracts between providers and insurers (Stuart et al., 2017), Health Homes (Minkoff & Gordon, 2016), Coordinated Care Organizations (Rieckmann et al., 2017), Collaborative Care Models and Collaborative Care Management (Ducharme, Chandler, & Harris, 2016; Raney, 2017; Saitz et al., 2013; Thorpe et al., 2017; Zwar et al., 2017), SBIRT (Screening, Brief Intervention, and Referral) (Babor et al., 2007), Chronic Disease Management (Norris et al., 2003), Clinical Liaisons (Ducharme et al., 2016), and Illness Management and Recovery (Mueser et al., 2002).

Many of these approaches to integrated care are becoming more prevalent (Minkoff & Gordon, 2016; Rieckmann et al., 2017; Thorpe et al., 2017) and are beginning to yield positive outcomes (V. Lewis et al., 2014; Melek, Norris, & Paulus, 2014; Thorpe et al., 2017; Zivin et al., 2016) however, studies and reviews reporting the efficacy of these approaches tend to focus on one specific model (e.g. brief motivational interviewing or collaborative care) that targets one specific health behavior (e.g. depression or weight loss) in one specific healthcare setting (e.g. primary or emergency care)(Barnes & Ivezaj, 2015; Coventry et al., 2014; Schmidt et al., 2016). Although these reporting practices are useful, as they contribute to our greater understanding of specific intervention efficacy for behavioral change among certain populations, they lack a comparative and summative overview that healthcare organizations require in order to use these reports as reference for actionable change and/or adoption of innovative and evidence-based practices for improving the healthcare outcomes and costs for their entire patient population.

For the purpose of providing such a reference for healthcare organizations, the objective of this review is to present a broad overview of the range of models for integrated healthcare approaches and their effectiveness across healthcare settings. More specifically, this review uses an umbrella review approach (i.e. a systematic review of systematic reviews) (Aromataris et al., 2015). An umbrella review was chosen as a means to connect and compare previous reviews of research for multiple practices into one review in order to provide an overall assessment of integrated practices. For this review, the umbrella review was designed to answer the following questions:

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(1) What are the current integrated healthcare approaches and models employed within PC, specialty care, inpatient care, and emergency care settings?

(2) In regard to healthcare cost and patient health outcomes, what is the effectiveness of these approaches/models within these four settings?

Methods

Search Procedure

A systematic search of systematic and meta-analysis reviews published between January 1, 2009 and February 15, 2018 was conducted using three search engines encompassing five databases: EBSCO (CINAHL Complete, PsycARTICLES, and PsycINFO), PubMeb (Medline), and Ovid (ENBASE). The search strategy used MeSH terms, equivalent subjects, and related words for reviews covering integrated behavioral medicine in healthcare settings. Three groups of keywords/terms included: integrated practice terms (*integrated health care*, *continuity of patient care*, *disease management*, *family centered care*, *multidisciplinary care team*, *patient centered care*, or *collaborative care*) cross-referenced with healthcare settings (*PC*, *secondary care*, *emergency care*, or *acute care*) and behavioral health (*behavioral health*, *mental health*, *addiction*, *substance abuse*, *comorbid*, or *co-occurring*). Search protocol available in Appendix (A-7).

Eligibility Criteria and Selection Process

Eligible reviews included English language systematic reviews and/or meta-analysis reviews with included participant populations of the adult age (17+ years of age). Only reviews that included integrated healthcare approaches/models with a

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behavioral health treatment component (e.g. psychology consult, behavioral therapy, or mental health specialist) that were initiated and/or performed in either a primary, specialty, in-patient (IP), or emergency care (ED) setting were included. Definitions for what was considered a systematic review and meta-analysis review were defined from Grant & Booth's (2009) 14 review types. Quality was appraised using Aromataris et al.'s appraisal checklist for systematic reviews and research synthesis (Aromataris et al., 2015). This appraisal checklist originally consisted of nine questions designed to identify if certain quality dimensions were met. For example, "Is the review question clearly and explicitly stated?" and "Was the search strategy appropriate?". However, an additional question, "Was the likelihood of publication bias acknowledged?" was added to the checklist to support the question, "Was the likelihood of publication bias assessed?". This question was included because varying sample size may prevent the assessment of publication bias and the acknowledgement of this occurrence is reflective of higher quality methodology when compared to no mention of potential bias or its assessment. Each question was scored with a 'Yes' for meeting the criteria, a 'No' for not meeting the criteria, 'Unclear' for partially meeting a criterion but without clarity, and 'N/A' for no mention. Met criteria were scored with one point and totaled for each review. No points were awarded for other categories. Reviews with a score of ten were labelled as 'Excellent' quality, eight and nine points were 'Good', six and seven were 'Moderate', five were "Low", and less than five were "Very low" and removed from the umbrella review. Data were extracted, summarized, and tabled using a variation of Aromataris et al.'s umbrella review methodology (Aromataris et al., 2015).

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Results

A total of 4,654 reviews were identified from the initial search. After the removal

of duplicates (n=109) and those screened out by title (n=3,894) and abstract (n=467),

184 reviews were assessed for eligibility. Sixteen reviews were removed because a full-

text article could not be located, 13 reviews were removed due to inappropriate outcome

measures (e.g. no patient-level health or cost outcomes), 12 were removed due to a lack

of a behavioral health component, 36 were removed due to inappropriate methods (e.g.

no inclusion/exclusion criteria listed), 12 were removed due to no behavioral health

integration (e.g. studies focused on behavioral health treatment, but not both physical

and mental health treatment), and 45 were removed as a result of being out the scope of

this review (e.g. outcomes measures were only of patient engagement or intervention

barriers, interventions were not conducted in healthcare settings, etc.). After screening

and eligibility assessment, 50 full-text articles remained and were assessed for quality.

Figure 1 presents a flowchart of the reviews during the selection process.

Quality and Heterogeneity of the Included Reviews

The 50 included systematic reviews were appraised for quality and detailed in

Table A-1 in the appendix. Overall, reviews were of good quality with 13 excellent, 31

good, 5 moderate, and 1 low quality. Both the type of heterogeneity that was identified

by the authors of the reviewed studies within each systemic review and the reporting of

this heterogeneity between the systematic reviews varied greatly. As such, an objective

heterogeneity score could not be reported in this umbrella review (e.g. high, medium,

low). Therefore, the potential sources of heterogeneity described in this umbrella review

were reported as the same sources of heterogeneity acknowledged by the authors of each systemics reviews. This information can be found on Table 1. Reviews in which the author acknowledged potential heterogeneity but did not list specific sources were classified as 'unclear', and reviews in which the author did not acknowledge heterogeneity were classified as 'not mentioned'. One study was shared with nine systematics reviews, seven studies were shared with six systematic reviews, ten with five, 22 with four, 54 with three, 102 with two, and 564 studies were only referenced by one systematic review.

Types of Models

After screening and quality appraisal of each systematic review, the integrated healthcare models assessed within each review were categorized into five approaches: behavioral interventions, brief interventions, complex interventions, computer-based, and non-specific. Within these approaches, each were categorized according to the type of healthcare professionals that delivered the intervention.

Figure 1. Flowchart of studies on integrated care within healthcare settings selected for this review
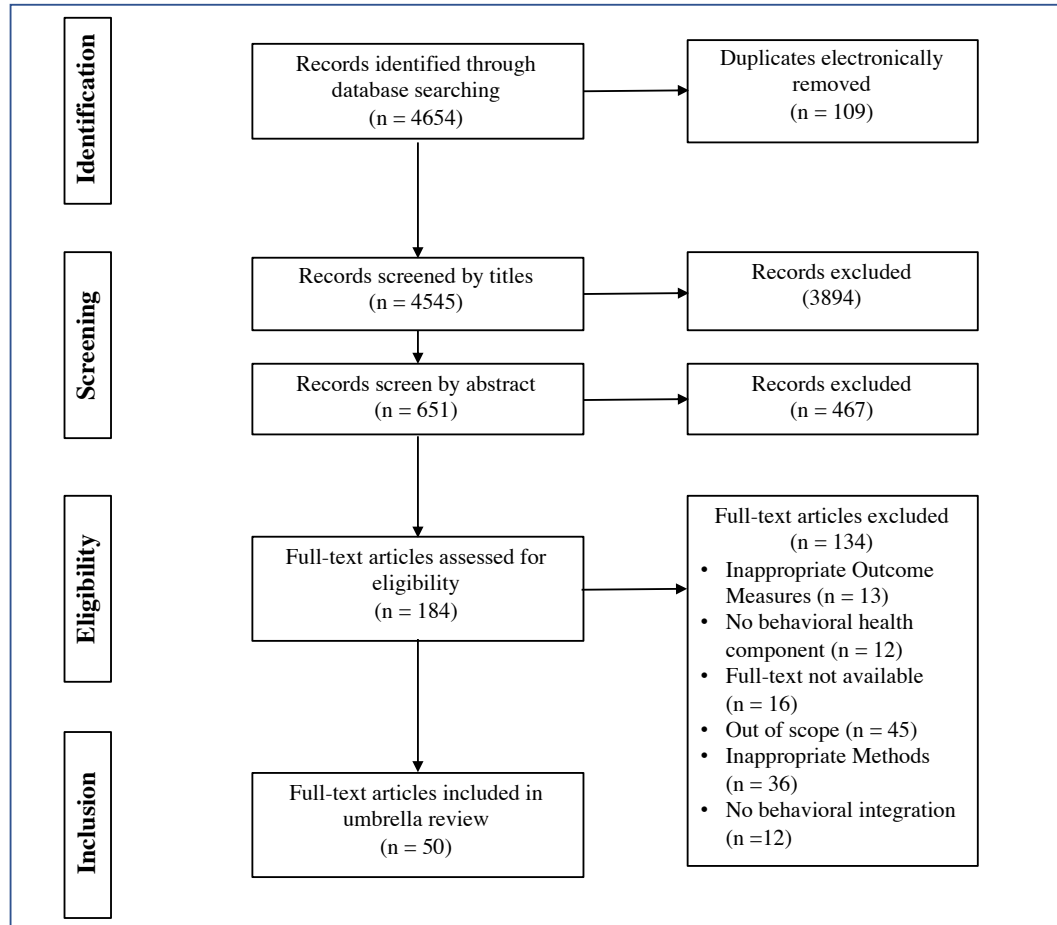
These included specialists only (e.g. mental health professionals or trained

research staff members), non-specialists only (e.g. nurses, family medicine physicians,

or advanced practice providers), or a mix of both specialists and non-specialists.

Secondary credentialing for healthcare professionals were not provided in these reviews.

Although models within each approach frequently overlap in therapy, deliverer, and/or

setting, models were differentiated by the intervention under review and tabled by

individual systematic review. This format was chosen due to greater heterogeneity

within groups (individual study conclusions within each systematic review) than

between groups (individual systematic review conclusions). A list of the included

systematic reviews and a brief summary for the characteristics and definitions of the

models, often listed verbatim of the author, is provided in Table 1.

Table 1 Characteristis of approaches for selected reviews.

Model	Author/year	Heterogeneity	Behavioral Interventions - mix of specialist & non-specialist
			Characteristics of Approach
Behavioral Therapy (multiple)	Booth et al., 2014	Unclear	Theory-based behavioral therapies included SCT, TM, Behavioral Self-Management theories. Individual and/or group face-to-face, telephone, and/or online [diet/exercise] interventions delivered by project staff, health couches, nurses, physicians, or nutritionists. Duration varied between 6 and 24 months.
	Bower et al., 2011	Controls, bias, intervention approach, analysis of effects	Bower et al. described counselling as the "skilled and principled use of relationships which develop self-knowledge, emotional acceptance and growth, and personal resources. The counsellor's role is to facilitate the client's work in ways that respect the client's values, personal resources and capacity for self determination. Counselling included non-directive, person-centered and process-experiential methods, as well as cognitive behavioral and psychodynamic approaches. Counselling was delivered by counsellors, community nurses, social workers, clinical psychologists, and PCPs. Only practitioners with a formal counselling qualification equivalent to BACP accreditation levels were included in the review." Treatment sessions ranged from 6 to 24 sessions with the majority between 6 to 12 sessions, which were delivered weekly and one hour in length.
	Cuijpers et al., 2009	Demographics, outcome intensity, outcome reporting	Cuijpers et al. described psychological treatment as "interventions in which verbal communication between a therapist and a client was the core element, or in which a psychological treatment was written down in book format or a computer program (guided self-help or bibliotherapy) that the client worked through more or less independently, but with some kind of personal support from a therapist (by telephone, email, or otherwise)." Treatments included CBT, PST, non-directive counseling, psychodynamic counseling, and interpersonal psychotherapy. Sessions varied from group to mostly individual and mostly face-to-face. Session frequency ranged from 6 to 16 sessions and were delivered by psychologists, psychiatrists, PCPs, nurses, counselors, social workers, and/or students.
	Linde et al., 2015	Treatment type	Linde et al. described psychological treatment as "interventions that are based on a scientific theoretical background and that use psychological techniques to reduce symptoms and improve general well-being through modifying motivational, emotional, cognitive, behavioral, or interpersonal processes." Treatments were performed as a "tailored, verbal communication process between a patient (or a group of patients) and a health care professional in direct or remote (e.g. telephone) contact or as a less-intense or nonguided intervention using written information material (e.g. book or computer program) that the patient worked through more or less independently." Patients were recruited through direct referral from a PCP not specialized in mental health care, by systematic screening of patients in the waiting room, or from a PCP patient panel. Treatments included CBT, brief cognitive therapy, PST, and interpersonal psychological therapy. Treatment was delivered by a psychologist, therapist, trained physician, psychiatrist, counselor, or nurse. Session frequency ranged from 6 to 20 sessions with the majority consisting of 6 sessions. Length of sessions were unclear, but were categorized to be less than 90 minutes of contact.
	Barrett & Chang, 2016	Not mentioned	Behavioral therapies included MORE, ACT, IPT-P, CBT, Mindfulness, or MI. Delivery method was in groups, individually, or by computer. Session duration varied from 60 to 240 min, and treatment frequency ranged from one to four times a week.
	Bernardy et al., 2017	Unclear	Behavioral therapies included Operant Therapy, traditional CBT, self-management education programs, or acceptance-based CBT delivered from, or supervised by, a trained healthcare professional. Delivery method was face-to-face or by telephone, individual or group sessions with a median duration of 10 weeks, 10 sessions, and 18 total hours.

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Table 1 *(continued)*

Behavioral Interventions - mix of specialist & non-specialist *(continued)*

Model	Author/year	Heterogeneity	Characteristics of Approach
Motivational Interviewing	Kohler & Homann, 2015	Drinking frequency and quantity	Kohler & Homann characterize MI such that it assumes that facilitating and engaging intrinsic motivation is essential for behavioral change with its central purpose of examination and resolution of ambivalence. Counselors provide focused and directed feedback for goal setting and achievement. Interventions ranged from 5 to 45 minutes with the majority lasting longer than 20 minutes (median of 37 minutes). Patients were screened for hazardous drinking (self-reported alcohol consumption), BAC, alcohol in saliva or breath, high-risk behavior in conjunction with alcohol use, or a combination of these for eligibility. Interventions were standard care (alcohol use handouts, normative resetting, skills training, 'booster' phone calls, educational brochures, brief discussions with psychologists, and/or contact lists) plus MI, delivered by a trained study staff member, peer educator, social worker, PCP, or counselor. MI sessions ranged from 20 to 45 minutes in length and occurred face-to-face or by telephone. Of the studies that included follow-up sessions, these ranged from three months to one year.
	VanBuskirk & Wetherell, 2013	Outcome measures, subgroup analysis	MI was tailored to the primary care population addressing substance use, dietary and exercise-related goals, medication adherence, colorectal screening, and passive smoke exposure within households. Delivery method was face-to-face or by telephone by clinicians, doctors, nurses, or other trained professionals. Session frequency ranged from 1 to 11 sessions with most consisting of 4 or fewer sessions. Sessions varied in length up to 60 minutes with the majority around 20 minutes.
	Morton et al., 2014	Intervention components, duration, providers, follow-up, participants, outcome measures	As described by Morton et al., MI interventions included "goal setting, providing social support, action planning, providing feedback (behavioral feedback and biofeedback, problem-solving, generating a discussion of pros and cons regarding the target behavior, presenting information in favor of or against target behavior from a credible source, goal review, providing information on the consequences of drinking, highlighting the discrepancy between current behavior and goal, self-monitoring, rewarding behaviors, discussing behavioral substitutions, social comparison, providing instructions on how to perform the behavior, the comparative imaging of future outcomes, verbal persuasion about capability, providing information about antecedents of the behavior, and asking person to affirm commitment to the behavior. Approximately half of the studies used face-to-face only and half used both face-to-face and phone MI sessions. The number of face-to-face sessions ranged from one session only up to more than eight sessions, lasting between <13 minutes and >45 minutes, with most studies reporting sessions that lasted between 11 and 20 minutes." Training for MI delivery varied greatly.
Motivationing Interviewing	Barnes & Ivezaj, 2015	Intervention definition, training, fidelity, adherence, and outcome measures	Approach consisted of individual therapy only, or a mix of individual and group therapy. According to Barnes & Ivezaj, "Behavioral weight loss or cognitive behavioral techniques, such as self-monitoring were incorporated into treatment. MI treatment was implemented above and beyond typical primary care appointments or into the practitioner's regularly scheduled primary care appointments." Treatment exposure (combined time) ranged from 60–75 minutes over 3 months to 720 minutes over 12 months. Most were 6 months or longer. Approx. 1/3 of the studies used "intervention teams to provide the MI intervention with clinicians of varying backgrounds, including professionals such as dieticians, nurses/nurse practitioners, medical doctors, or sports and health science specialists. Others incorporated one type of interventionist such as nurse practitioners, physicians, exercise specialists, dieticians, 'Masters-level counsellors', medical assistants and the remaining did not specify educational background (e.g. 'trained non-specialists')." Training for MI delivery varied greatly.
Multi-component Interventions	Martin Cantera et al., 2015	Intervention Intensity, follow-up	Intervention components included: raising awareness of the problem, education, motivation, behavioral change, and medications by method of individual or group sessions, telephone conversations, brochures or quit-smoking kits, and medications. Behavioral interventions included MI, behavioral therapy, and/or TM. Intervention intensity and frequency varied greatly, as did delivery personnel (e.g. PCP, MHP, etc.) and training.
Nurse-led Self-Management	Baker & Fatoye, 2017	Intervention approach, duration, components, intensity, and follow-up	As described by Baker & Fatoye, NLSM consisted of both scheduled and unscheduled contacts, which varied between two 20-minute telephone calls and five 120-minute group sessions that were followed by weekly 1 hour small group fitness classes for two years. The delivery methods varied; most programs included at least one face-to-face contact with a nurse, although five studies involved interventions delivered entirely via telephone contact. Face-to-face interventions were delivered individually or in groups and were often a mix with telephone contacts. All interventions consisted of two or more components with considerable variation in content. The behavior change theories employed included Self-Regulation Theory, Bandura's Self-Efficacy Theory, the PRECEDE-PROCEED model of health program planning and evaluation, TM, and CBT. Interventions were delivered by specialist respiratory nurses, advanced nurse practitioners, community health nurses, research nurses and what were described as 'experienced nurses'. All nurses had training or experience beyond basic the nurse certifications.

Table 1 *(continued)*

		Behavioral Interventions - mix of specialist & non-specialist *(continued)*	
Model	**Author/year**	**Heterogeneity**	**Characteristics of Approach**
Problem Solving Therapy	Zhang et al., 2017	Not mentioned	As described by Zhang et al., PST is a "nonpharmacological, competence-based intervention that involves a step-by-step approach to constructive problem solving. Developed from CBT, PST is a short-term psychotherapy approach delivered individually or in group settings. The generic PST manual contains 14 training modules that guides PST providers working with patients from establishing a therapeutic relationship to identifying and understanding patient prioritized problems; from building problem-solving skills to eventually solving the problems. Focused on patient problems in the here-and-now, a typical PST treatment course ranges from 7 to 14 sessions and can be delivered by various health care professionals such as physicians, clinical social workers or nurse practitioners. Because the generic PST manual outlines the treatment formula in detail, providers may deliver PST after receiving 1 month of training." The reviewed interventions were between 3 and 12 sessions, ranging 30 to 60 minutes in length, and delivered by psychologists, trained counselors, PCPs, nurses, and social workers.
Psychological and Educational Interventions	Conejo-Ceron, 2017	Unclear	Psychological and educational interventions included CBT, PST, or stepped-care programs delivered by psychologists, PCPs, social workers, home care nurses, community health workers, prevention specialists, student therapists, medical students, graduate nursing students, or trained counselors. Session frequency ranged from 3 to 12 sessions (median of 6 sessions) by group (majority) or individual meetings.

		Behavioral Interventions - non-specialist	
Mental Health Promotion	Fernandez et al., 2014	Unclear	As described by Fernandez et al., MHP focuses on "the encouragement of individual resources and skills and improvement in the socioeconomic environment are among them by targeting a broad variety of problems and their positive factors. MHP aims to enhance overall wellbeing of the general healthy population." Of the three studies reviewed, one employed the PRECEDE health education planning model delivered by nurses with average frequency of 19 home visits over 22 months, one study employed CBT conducted by trained (three training sessions) PCPs, and one study employed video vignettes of parent–child interactions, group discussion, role-play, rehearsal of parenting techniques, and home practice led by a home health nurse consisting of 10 weekly sessions (2 hours in length).

		Behavioral Interventions - specialist	
Mindful-based Stress Reduction or Mindful-base Cognitive Behavioral Therapy	Cramer et al., 2012	Unclear	Treatment consisted of a structured 8-week group program with weekly 2.5-hour sessions consisting of sitting meditation, walking meditation, body scan (a sustained mindfulness practice in which attention is sequentially focused on different parts of the body), and CBT. Treatment was delivered by a physician or a psychotherapist.

		Brief Interventions - mix of specialist & non-specialist	
Mixed Therapies	Cape et al., 2010a	Outcome measures, # treatment sessions, follow-up intervals, country, # participants, recruitment, therapy type, diagnoses, analysis methods	Therapy consisted of more than two and less than 10 appointments. Of the studies reviewed by Cape et al., 12 included CBT, 7 included counselling, one included interpersonal psychotherapy, one included psychodynamic psychotherapy and 12 included PST. Therapy was conducted in primary care settings (majority), home and telephone therapy were also employed. Median treatment frequency was 6 to 7 sessions over 12 to 14 weeks. Exposure time was not discussed.

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Table 1 *(continued)*

Model	Author/year	Heterogeneity	Characteristics of Approach
			Brief Interventions - mix of specialist & non-specialist *(continued)*
	Alarez-Bueno et al., 2014	Intervention definition, type, duration, # sessions, and techniques	BI was defined as interventions lasting five to fifteen minutes and include some of the following therapies: MI, counseling, written materials, self-help manuals, or telephone calls. BI was delivered by nurses, psychologists, and social workers.
Screening and Brief Intervention	Schmidt et al., 2015	Type of intervention, outcome measures, participants, intervention target setting	As described by Schmidt et al., most SBI was conducted face-to-face, of which 8 studies were categorized as 'brief' (between 5 and 10 minutes, consisting of individual feedback and brief MI) and 18 were extended (15 to 40 minutes, extended MI). Non-face-to-face interventions consisted of interactive computer programs, printed computer-generated feedback, leaflets, or text messages. Eight studies employed one 'booster' session of 5–30 minutes (median of 15 minutes) duration, between 2 weeks and 3 months after discharge. BI conducted was typically directly after assessment and before patients left the ED. Seven publications reported that BI was scheduled on separate appointments. In 12 of the 20 face-to-face BI studies, BI was delivered by an external interventionist (e.g. research staff with degree in counseling). Nine studies used ED personnel or trained nurses.
	Bray et al., 2011	Utilization analysis, setting analysis, publication origins	Method used was SBI, however, specifics are unclear.
	Keurhorst et al., 2015	Implementation strategy,	Most interventions were delivered by or a combination of a physician, primary care staff, nurse practitioner, PA, practice assistant, or another other health provider, and consisted of educational meetings (n=6), educational outreach visits (n=5), or audit/feedback (n=4). Length of session were not defined.
Ultra-Brief Interventions	McGinnies et al., 2016	Studies, populations, interventions, and outcome measures	Ultra-BI was defined as any face-to-face interaction of 10 min or less or any non face-to-face intervention involving technology. Studies consisted of a mix of face-to-face interactions of 10 min or less, computer interventions, mobile phone interventions, and/or pamphlet-only interventions. Ultra-BIs were delivered by research social workers, research assistants, physicians, residents, PAs, nurses, and/or ED or primary care staff.
			Brief Interventions - non-specialist
Screening and Brief Intervention	Elzerbi et al., 2017	Intervention follow-ups, intervention target setting	Brief intervention (BI) was defined as no more than 4 sessions (less than 45 minutes in length), delivered face-to-face, by short message service, detailed health information workbooks, over the telephone or electronically, and was delivered by non-specialist personnel and carried out in non-specialist settings. Non-specialist personnel include ED staff, nurses, health educators, or research staff. BI was initiated in the ED or schedule shortly after recruitment. Many studies included 'booster' follow up.
	Kaner et al., 2009	Setting, participants, screening instruments, controls	As described by Kaner et al., BI consisted of "simple structured advice, motivational counselling, CBT; self-completed action plans; leaflets, either on general health issues or specifically about alcohol; requests to keep drinking diaries and exercises to complete at home." BI consisted of "one to five sessions and lasted between 1 and 50 minutes, while total intervention exposure time ranged from 5 to 60 minutes. The median brief intervention treatment exposure was 25 min (interquartile range 7.5–30 minutes). Screening questionnaires included: general health questionnaires, such as the Health and Habits Survey with embedded alcohol questions; established alcohol screening tools, such as AUDIT, MAST, CAGE or variations and/or combinations of these." Most screening occurred during appointment scheduling, one study screened by telephones after scheduling. BI was delivered by PCP, psychiatrist, research assistant (psychology graduate), nurse, PA, or trained interventionist.
	Jonas et al., 2012	Intervention components, counseling approaches and strategies	BI was defined as treatment session length occurring between 10 and 15 minutes with brief behavioral counseling, which included a range of personal counseling and related behavior-change interventions that were used to help patients change health-related behaviors through a cooperative method. This required active participation from both patient and clinician and aimed to facilitate the patient's independent initiative. The goal of these interventions were to eliminate risky drinking practices rather than to achieve abstinence. Treatment included counseling, physician [brief] advice, self-help material, intervention workbooks, and was delivered by a PCP, clinic staff, nurse, research staff, trained psychologist, health educator, or PA. Delivery was face-to-face (vast majority), followed by telephone, and a mix of face-to-face and telephone (multiple sessions). Session length ranged from 5 to 40 minutes with most between 5 and 10 minutes.

Table 1 *(continued)*

			Brief Interventions - specialist
Model	Author/year	Heterogeneity	Characteristics of Approach
Mixed Therapies	Wray et al., 2017	None found	Interventions averaged 2.64 appointments and 113.67 minutes in total length and was delivered by physicians, nurses, or dentists. BI was mostly one-on-one interactions (86% of studies) consisting of MI (n=13), CBT (n=10), health education (n=7), simple simples (n=5), 5A/5Rs (n=4), relapse prevention (n=2), multicomponent interventions (n=1), or referral (n=1).
			Complex Interventions
Collaborative Care	Coventry et al., 2014	Outcome severity, participants, intervention fidelity, training, treatment engagement	Collaborative Care was as defined by Gunn et al. (Table A-2).
Collaborative Care	Grochtdreis, 2015	Study perspectives, settings, effect measures, intervention	Collaborative Care was defined as containing at least three of the four components from van Steenbergen-Weijenburg et al.'s characteristics of collaborative care (Table A-3).
	H Huang et al., 2017	Outcome effects, treatment rate, response rate	CC was defined to include the following principles: 1) patient-centered team care, 2) population-based care, 3) measurement-based treatment to target, and 4) evidence-based care. More specifically, H Huang et al. describes these principles. "Patient-centered team care involves primary care and behavioral health providers collaborating using patient goals and having both physical and mental health care at a familiar location. Population-based care involves the care team tracking patients in a registry to ensure appropriate follow-up. Patients who are not improving are provided with an intervention with mental health specialists providing caseload-focused consultation. Measurement-based treatment to target involves treatment plans that incorporate patient goals and clinical outcomes measured by evidence-based tools. Treatment plans actively change if patients are not improving. Evidence-based care involves offering treatments with evidence supporting efficacy."
	Hudson et al., 2015	Socio-economic factors, physical comorbidity, treatment type, and controls, reporting	Collaborative Care was as defined by Gunn et al. (Table A-2).
	Jacob et al., 2012	Not Mentioned	Jacob et al. distinguished CC as "the additional element of coordination among these physicians, nurses, psychiatrists, behavioral care providers, and pharmacists. The patient consults directly with the PCP (usually an MD); the PCP prescribes medication under the supervision of a psychiatrist, and the case manager (usually a nurse) monitors patient adherence and progress and also acts as the channel for feedback among all parties. Treatment may include psychotherapy, usually provided by a psychiatrist or psychologist."
	Panagioti et al., 2016	Intervention content, depression measures	Collaborative Care was as defined by Gunn et al. (Table A-2).
	Sighinolfi et al., 2014	Participants, intervention fidelity	Collaborative Care was as defined by Gunn et al. (Table A-2). Collaborative care givers included a mental health specialist, case manager, and PCP. CC included the use of treatment guidelines, scheduled follow-up visits, and regular contacts or scheduled supervisions with the mental health specialist. All but three studies provider psychiatric training to PCPs.
	van Steengen-Wijengurg et al., 2010	Not mentioned	Collaborative Care was defined as containing at least three of the four components from van Steenbergen-Weijenburg et al.'s characteristics of collaborative care (Table A-3).
	Watson et al., 2013	Outcome measures	Watson et al. defined CC as an example practice-based intervention "that (a) targets the care process within a system of care and (b) aims to improve depression or both depression and chronic medical conditions", which often included a care manager, and included MHS working together to provide comprehensive care to a patient. Most studies included the use of the IMPACT Model (Improving Mood-Promoting Access to Collaborative Treatment), with others using: HITIDES (HIV Implementation of Translating Initiatives for Depression into Effect Solutions), MODP (Multifaceted Oncology Depression Program), ADAP-C (Alleviating Depression Among Patients with Cancer), SMaRT Oncology I (Symptom Management Research Trial in Oncology), MDDP (Multifaceted Diabetes and Depression Program), Pathways, Bypassing the Blues, and TEAMcare.

Table 1 *(continued)*

Model	Author/year	Heterogeneity	Characteristics of Approach
			Complex Interventions *(continued)*
	Archer et al., 2012	Participants, interventions, comparisons, and	Collaborative Care was as defined by Gunn et al. (Table A-2).
	Huang et al., 2013	None found	Collaborative Care was as defined by Gunn et al. (Table A-2).
	van der Feltz-Cornellis et al., 2010	Intervention components, outliers, patient groups	Van der Feltz-Cornellis et al. categorized CC interventions as follows: 1) CC with psychiatrist giving consultation vis-à-vis to patient in the primary care practice; and psychiatrist supervising care manager and family physician; 2) Single psychiatric consultation vis-à-vis with patient in the primary care practice, in the presence of family physician, and advising family physician and patient by consultation letter; 3) CC with psychiatrist giving consultation vis-à-vis to patient in the primary care practice, and advising family physician, 4) Single psychiatric consultation, vis-à-vis with patient, not in the family practice, with a consultation letter to the family physician.
	Thota et al., 2012	Unclear	Collaborative Care was as defined by Gunn et al. (Table A-2).
	Tully & Baumeister, 2015	Timing of intervention, outcome severity, intervention design, control groups	Collaborative Care was as defined by Gunn et al. (Table A-2). Additionally, Tully & Baumeister note, "CC was managed by an allied health team in two trials, by nurses in two studies, and by social workers in two studies. The CC intervention duration ranged from 3 to 12 months and the median duration was 6 months. The psychotherapy component of the CC package consisted of PST in two studies, telephone-delivered manualized CBT in one study, referral to community mental health services in two studies, and was mixed in another study. The pharmacological component of the trials varied."
Collaborative Chronic Care Model	Woltmann et al., 2012	Intervention components, outcome measures	CCM was defined as containing at least three of the six criteria from Woltmann et al. excerpt listed in Table A-4.
			Complex Intervention *continued*
Consultation Liaison	Gillies et al., 2016	Unclear	According to Gillies et al., a CL "is a model of mental health care in which there is an interface between MHS and other health care providers...which has the potential to improve outcomes for people with a mental disorder by enhancing the ability of PCPs to diagnose and correctly treat mental disorders, provide an opportunity for early intervention, and ensure that the relationship between the PCP and [patient] is not disrupted." CL interventions were categorized into three levels of interactions: 1) between the MHS and the patient, 2) between the MHS and the PCP, and 3) between the PCP and the patient. Interactions between MHS and patients included assessment interviews, MHS referrals, distribution of psycho-educational materials (e.g. booklets and DVDs), structured advice, counseling, treatment monitoring, and education sessions. Delivery was face-to-face (majority) or by telephone. Interaction time varied. Interactions between MHS and PCP included patient diagnosis/treatment planning, transfer of MHS reports/recommendations to the PCP, availability of consultation advice, referrals, face-to-face training, and educational materials/treatment guidelines. Frequency ranged from 1 to 12 occasions depending on need.
	Cape et al., 2010b	Outcome measures	Cape et al., defined CL as "an intervention where patients were seen once or twice by a MHP for assessment (consultation) and advice to the [PCP] about management (liaison), but where no treatment was provided by the MHP." Cape et al.'s summary of intervention characteristics: "There was significant variation in the content and process. Psychiatrists provided the initial assessment of patients in three studies, and a mental health and a depression care manager were each used in a single study. The level of interaction between PCPs and specialists over each patient varied, from a single written report, through to joint meetings and a series of up to three discussions." Interaction intensity and frequency varied greatly.
Patient-centered Medical Home	Jackson et al., 2012	Unclear	See Table A-5 for the definition of PCMH. Implementation strategies varied too greatly to summarize.
Shared Care	Smith et al., 2017	Participants, measures for depression	According to Smith et al., shared care was defined as to include the following three categories: 1) liaison meetings between specialists and primary care team members for discussion and planning of ongoing management of prespecified chronic disease; 2) shared care record cards (usually patient-held), and 3) computer-assisted shared care and electronic mail whereby an agreed data set was collected in both primary and specialty care settings and circulated between sectors. This system could include centrally coordinated computerized registration and recall of patients. Interventions included combinations of previously established roles, clinical and referral guidelines, defined patient reviews, education and training for both patients and [mostly] clinical professionals (mostly nurse specialists), and synchronized patient records and recall systems. Interventions varied greatly in specific components, intensity, and frequency.

Table 1 *(continued)*

		Computer-based Interventions - mix of specialist and non-specialist	
Model	**Author/year**	**Heterogeneity**	**Characteristics of Approach**
Internet-based Intervention	Devi et al., 2015	Subgroup analysis	Internet-based was defined as interactive computer-mediated applications available via the Internet. Interventions include online heart care support communities; web-based education modules with interactive features; online discussion groups; personalized website outlining specific health-base risk factors; tailored goal setting for exercise, diet, depression/anxiety, and smoking; smartphone monitoring of health behaviors (e.g. diet/exercise) with education material and text messages; weekly education sessions, one-on-one chats with an expert, and monthly ask-the-expert sessions. Intervention length ranged from six weeks to one year.
Technology-assisted Interventions	Levine et al., 2014	Unclear	Interventions included the use web-based applications (63%), clinician-guiding software (44%), kiosks (19%), home PCs (13 %), mobile applications, and text message services. These included self-monitoring software/hardware, clinician guided weight loss goal setting, kiosks for obtaining baseline health behavior information (waiting rooms), and dietary record keeping. Intervention length ranged from 3 to 36 months and were delivered by physicians, dieticians, psychologists, community health educations, fitness instructors, weight-loss couches, and nurse practitioners.
		Computer-based Interventions - non-specialist	
Computer-based screening, interventions, and referral	Choo et al., 2012	Not Mentioned	Computer-based technology included health behavior monitoring, computer screening and tailored printout of advice and/or referrals, computerize SBIRT/SBI, and/or psychiatric/mental health screening.
Digital and Computer-based Alcohol Interventions	Nair et al., 2015	Not mentioned	Interventions include a digital or computer-based interventions (e.g. laptops, computer touch-screen kiosks or mobile devices) used as a medium to deliver alcohol use, or alcohol use and physical activity, smoking, and/or diet, interventions. Only one study included direct involvement of a health professional (e.g. referral to e-intervention). Most interventions included patient input of alcohol use information followed by brief feedback in printout form to be viewed by a treating clinician. Other interventions included immediate feedback for patients in which they had the ability to monitor drinking behavior, receive text message feedback, or had open-access to a website for feedback. Intervention length ranged from 1 to 12 months with the majority between 3 and 6 months.
		Non-specific Interventions	
Non-specific	Pelletier et al., 2014	Intervention type, control groups, and follow-up	Unspecific tobacco cessation intervention consisting of MI, 5As, BI, pamphlets, self-help material, computerized screening, and/or patient education. Intervention length ranged from 2 to 30 minutes (37 minutes average for MI), delivered face-to-face and/or over the telephone by an addiction counselor or physician.

Test, BAC (blood alcohol concentration), BACP (British Association for Counseling and Psychotherapy), BI (Brief Intervention), CBT (cognitive behavioral therapy), CC (collaborative care), CCM (Collaborative Chronic Care Model), CL (consultation liaison), CPMH (Patient-centered Medical Home), ED (Emergency Department), IPT-P (Inter-personal psychotherapy adapted for pain), MAST (Michigan Alcoholism Screening Test), MHP (mental health promotion), MHS (mental health specialists), MI (motivational interview), MORE (Mindfulness Oriented Recovery Enhancement), NLSM (nurse-led self-management), PA (physician assistant), PCP (primary care provider), PST (problem-solving therapy), SBI (screening and brief intervention), SBIRT (screening, brief intervention, and referral to treatment), SCT (social cognitive theory), TM (Transtheoretical Model). Studies highlighted for quality: green (excellent), yellow (good), orange (moderate), and red (poor)

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Behavioral Interventions

Interventions that were not defined as brief by the reviewing authors and employed behavioral theory-based therapy as the main intervention component were categorized as behavioral interventions. Sixteen of the 50 the reviews assessed behavioral intervention models, of which 13 were delivered by a mix of specialist and non-specialist providers, one by non-specialist providers, and one by only specialist providers. Of those delivered by a mix of specialists and non-specialists, six reviews accessed behavioral therapy-based approaches in primary care (PC) for promoting weight loss (Booth et al., 2014), mental health (Bower et al., 2011), and depressive disorders (Cuijpers et al., 2009; Linde et al., 2015). Additionally, two reviews assessed depressive disorders, chronic pain and substance use (Barrett & Chang, 2016), and Fibromyalgia Syndrome (FMS) (Bernardy, Klose, Welsch, & Hauser, 2018) in both primary and specialty care (Barrett & Chang, 2016; Bernardy et al., 2018). Two reviews assessed motivational interviewing (MI) in PC for multiple health behavior change (blood pressure, substance use, body weight reduction, and physical activity) (Morton et al., 2015; VanBuskirk & Wetherell, 2014), one targeting weight loss in both primary and specialty care (Barnes & Ivezaj, 2015), and one substance use (alcohol) in emergency care (ED) (Kohler & Hofmann, 2015). The remaining were in PC only and assessed multicomponent interventions on tobacco use (Martin Cantera et al., 2015), Nurse-led Self-Management (NLSM) on Chronic Obstructive Pulmonary Disease (COPD) (Baker & Fatoye, 2017), problem-solving therapy (PST) on depressive and anxiety disorders (Zhang et al., 2018), and psychological/educational interventions depressive disorders

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(Conejo-Ceron et al., 2017). One review assessed mental health promotion (MHP) in PC with non-specialists only (A. Fernandez et al., 2015), and the other assessed Mindful-based Stress Reduction (MBSR)/Mindful-based Cognitive Behavioral Therapy (MBCT) for low back pain in specialty settings with specialists only (Cramer et al., 2012). A summary for results found in each systematic review can be found in Table 2.

Behavioral therapies were most frequently formatted around Cognitive Behavioral Theory (CBT), Problem Solving Therapy (PST), Social Cognitive Theory (SCT), MI, the Transtheoretical Model (TM), behavioral self-management, and/or interpersonal psychological therapy. Across all studies, types of therapy did vary, but no one particular therapy was indicated as more effective than another. However, outcomes for each model did vary by targeted health behavior. Behavioral therapies targeting diet and weight loss had no significant impact, regardless of type of therapy (Booth et al., 2014; Morton et al., 2015; VanBuskirk & Wetherell, 2014). Counseling was effective in the short-term for general mental health improvement, some reduction in healthcare utilization, but no reduction in healthcare cost and no long-term advantages in mental health improvement (Bower et al., 2011). Evidence for the efficacy of mental health promotion on mental health was too weak to confirm effectiveness (A. Fernandez et al., 2015).

Table 2 Results from the Selected Reviews

		Behavioral Interventions - mix of specialist & non-specialist			
Model	Setting	Summarized Result	Author/year	# studies(trials)/participants	Reviewed Health Outcome
Behavioral Therapy (multiple)	Primary Care	Very small clinically insignificant benefits in body weight reduction.	Booth et al., 2014	15/4,539	Weight loss
	Primary Care	Significantly greater clinical effectiveness in short-term mental health outcomes compared to usual care, no long-term advantages. Some reduction in healthcare utilization. No overall reduction in healthcare costs.	Bower et al., 2011	16(9)/4,108	Mental health
	Primary Care	Effective for treating depression in primary care, especially when PCPs refer patients with depression for treatment.	Cuijpers et al., 2009	15/1,505	Depressive disorders
	Primary Care	Psychological treatments are superior to usual care alone, the size of the effects being small to moderate.	Linde et al., 2015	37(30)/5,159	Depressive disorders
	Primary and Specialty Care	MORE, ACT, and CBT combined with MI demonstrated efficacy in improving chronic pain symptoms, comorbid depression, and SUD in various combinations. MORE was the only intervention that showed efficacy for pain severity.	Barrett & Chang, 2016	6/696	Depressive disorders, chronic pain, and substance use
	Primary and Specialty Care	CBTs provided a clinically relevant benefit over control interventions in reducing some key symptoms of FMS and disability at the end of treatment.	Bernardy et al., 2017	29/unclear	Fibromyalgia Syndrome (FMS)
Motivational Interviewing	Emergency Care	MI is at least as effective as other brief interventions in emergency care to reduce alcohol consumption in young people.	Kohler & Homann, 2015	8(6)/1,433	Substance use (Alcohol)
	Primary Care	MI has been found to be generally effective with primary care populations, although certain modes of delivery or targets may be better than others.	VanBuskirk & Wetherell, 2013	12/unclear	Blood pressure, substance use, body weight reduction, physical activity
	Primary Care	Insufficient evidence to confirm effectiveness.	Morton et al., 2014	35/unclear	Physical activity, diet, alcohol intake
	Primary and Specialty Care	Insufficient evidence to confirm effectiveness.	Barnes & Ivezaj, 2015	24/unclear	Weight loss

Table 2 *(continued)*

Intervention	Setting	Findings	Source	N	Condition
Behavioral Interventions – mix of specialist & non-specialist *(continued)*					
Multi-component Interventions	Primary Care	More effective in continuous long-term tobacco cessation than usual care and counseling alone.	Martin Cantera et al., 2015	10(9)/unclear	Substance use (Tobacco)
Nurse-led Self-Management	Primary Care	Insufficient evidence to confirm effectiveness.	Baker & Fatoye, 2017	26/3,384	Chronic Obstructive Pulmonary Disease (COPD)
Problem Solving Therapy	Primary Care	PSTs are effective for primary care depression and/or anxiety, and physician-involved PST offer meaningful improvements for primary care patients' depression and/or anxiety.	Zhang et al., 2017	11/2,072	Depressive and anxiety disorders
Psychological and Educational Interventions	Primary Care	Moderate significant effect in preventing depression symptoms. Limited evidence for long-term effect.	Conejo-Ceron, 2017	14/7,365	Depressive disorders
Behavioral Interventions – non-specialist					
Mental Health Promotion	Primary Care	Insufficient evidence to confirm effectiveness.	Fernandez et al., 2014	3/1,300	Mental health
Behavioral Interventions – specialist					
Mindful-based Stress Reduction or Mindful-base Cognitive Behavioral Therapy	Specialty Care	Inconclusive evidence to confirm effectiveness.	Cramer et al., 2012	3/117	Low back pain
Brief Interventions – mix of specialist & non-specialist					
Mixed Therapies	Primary Care	Although lower effect sizes as compared to longer length treatments, brief CBT, counselling, and PST are effective treatments for depression. Brief CBT for anxiety has comparable effect size.	Cape et al., 2010a	43/3,962	Depressive and anxiety disorders
Screening and Brief Intervention	Primary Care	Reduced alcohol consumption.	Alarez-Bueno et al., 2014	7/unclear	Substance use (Alcohol)
	Emergency Care	Very small effects of brief interventions on alcohol consumption reductions. More intensive interventions showed no benefit over shorter approaches.	Schmidt et al., 2015	33(28)/14,456	Substance use (Alcohol)
	Primary, Emergency, and Inpatient Care	Insufficient evidence to confirm effectiveness.	Bray et al., 2011	29/unclear	Substance use (Alcohol)
	Primary Care	No significant effect on alcohol consumption.	Keurhorst et al., 2015	29/unclear	Substance use (Alcohol)

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Table 2 *(continued)*

Intervention	Setting	Description	Reference	N	Condition
Brief Interventions – mix of specialist & non-specialist *(continued)*					
Ultra-Brief Interventions	Emergency Care	Ultra-BIs in the ED had limited effectiveness in reducing alcohol use in the short term. No studies showed an effect on frequency of alcohol consumption or ED representation.	McGinnies et al., 2016	13/6,281	Substance use (Alcohol)
Brief Interventions – non-specialist					
Screening and Brief Intervention	Emergency Care	Inconclusive evidence to confirm effectiveness.	Elzerbi et al., 2017	22/15,173	Substance use (Alcohol)
	Primary and Emergency Care	Brief intervention reduced the quantity of alcohol drunk per week in men. Insufficient evidence for a similar effect in women.	Kaner et al., 2009	25/2,754-5,860	Substance use (Alcohol)
	Primary Care	Behavioral counseling improved drinking behavior outcomes (moderate strength) and reduce hospital days (low strength) for non-alcohol independent risky drinking adults.	Jonas et al., 2012	38(23)/4,332	Substance use (Alcohol)
Brief Interventions – specialist					
Mixed Therapies	Primary Care	Neither length nor total number of interventions moderate tobacco use. Type of intervention (e.g. MI, CBT, etc.) is not related to outcome.	Wray et al., 2017	36/12,975	Substance use (Tobacco)
Complex Interventions					
Collaborative Care	Primary Care	CC with psychological treatment, with or without anti-depressant medication, was associated with improved depression symptoms. Patients with a chronic physical conditions reported improved use of anti-depressant medication.	Coventry et al., 2014	85(74)/21,345	Depressive disorders
	Primary Care	Cost-effectiveness ambiguous depending on willingness to pay. Insufficient evidence to confirm effectiveness.	Grochtdreis, 2015	19/7,831	Depressive disorders
	Primary Care	Improved treatment outcomes and adherence.	H Huang et al., 2017	7/1,997	Depressive disorders
	Primary Care	Improves social function for patients with depression up	Hudson et al., 2015	18/7,600	Depressive disorders
	Primary Care	CC for management of depressive disorders provides good economic value	Jacob et al., 2012	20/unclear	Depressive disorders
	Primary Care	CC is associated with significant short-term improvements in depression outcomes across all people with or without comorbid physical conditions.	Panagioti et al., 2016	31/10,962	Depressive disorders

Table 2 *(continued)*

	Complex Interventions *(continued)*			
Primary Care	CC is more effective than treatment as usual in improving depression outcomes.	Sighinolfi et al., 2014	17/3,240	Depressive disorders
Primary Care	Insufficient evidence to confirm effectiveness.	van Steengen-Wijengurg, 2010	8/4,868	Depressive disorders
Primary Care	CC interventions improved outcomes for depression and quality of life in primary care patients with varying medical conditions. Insufficient evidence on medical outcomes.	Watson et al., 2013	12/4,047	Depressive disorders
Primary Care	Improvements in anxiety and depression symptom in the short-term, medium-term, and long-term.	Archer et al., 2012	79/24,308	Depressive and anxiety disorders
Primary Care	CC significantly improved depression outcomes, and adherence to antidepressant medication and oral hypoglycemic agents.	Huang et al., 2013	8/2,238	Depressive disorders and comorbid diabetes
Primary Care	Psychiatric consultation is effective in patients with somatoform and depressive disorder. Largest effects are seen in reduction of utilization of health care services.	van der Feltz-Cornellis et al., 2010	10/3,408	Depressive and somatoform disorders
Primary and Inpatient Care	CC models are effective in achieving clinically meaningful improvements in depression outcomes.	Thota et al., 2012	32/unclear	Depressive disorders
Primary and Inpatient Care	CC was associated with a significant reduction in major adverse cardiac event in the short-term, but not sustained long-term. Small effects were observed for depression, depression remission, anxiety, and mental QOL. No benefit to healthcare costs.	Tully & Baumeister, 2015	6/1,284	Depressive disorders and comorbid Coronary Heart Disease (CHD)
Primary and Specialty Care	Small to medium effects of CCMs across multiple disorders with regard to clinical symptoms, mental and physical quality of life, and social role function, with no net increase in total health care costs.	Woltmann et al., 2012	161/unclear	Mental health
Consultation Liaison				
Primary Care	CL improves mental health up to three months and adherence up to 12 months in people with mental disorders. Evidence that CL is less effective than collaborative care for mental disorder symptoms, disability, general health status, and provision of treatment. Results for CC were modest.	Gillies et al., 2016	24(12)/2,605	Mental disorders

Collaborative Chronic Care Model

Consultation Liaison

Table 2 *(continued)*

		Complex Interventions *continued*			
Consultation Liaison	Primary Care	No significant effect on antidepressant use or depression outcomes.	Cape et al., 2010b	5/1,065	Depressive disorders
Patient-centered Medical Home	Primary Care	Insufficient evidence to confirm effectiveness.	Jackson et al., 2012	Effectiveness: 44(19)/unclear; Description: 55(31)/unclear	Non-specific
Shared Care	Primary Care	Shared care improves depression outcomes and probably has mixed or limited effects on other outcomes (hospital admissions, service utilization, diabetes, hypertension, etc.), particularly stepped care models of shared care.	Smith et al., 2017	22-42/unclear	Depressive disorders and other chronic health conditions
Computer-based Interventions – mix of specialist and non-specialist					
Internet-based Intervention	Primary, Specialty, and Inpatient Care	Inconclusive evidence to confirm effectiveness.	Devi et al., 2015	18/1,392	Coronary Heart Disease (CHD)
Technology-assisted Interventions	Primary Care	Compared to usual care, technology-assisted interventions in the PC setting help patients achieve weight loss. Best practices remain undetermined.	Levine et al., 2014	16/6,786	Weight loss
Computer-based Interventions – non-specialist					
Computer-based screening, interventions, and referral	Emergency Care	Some evidence of efficacy in reducing high-risk alcohol use, but limited clinical outcomes	Choo et al., 2012	20/unclear	Substance use and mental health
Digital and Computer-based Alcohol Interventions	Primary, Emergency, and Inpatient Care	Digital and computer-based programs are effective in reducing alcohol consumption and drinking related consequences. Extended interventions which offer additional opportunities to monitor drinking over time appear no more effective than single occasion brief interventions.	Nair et al., 2015	17(15)/6,390	Substance use (Alcohol)
Non-specific Interventions					
Non-specific	Emergency Care	ED visits in combination with ED-initiated tobacco cessation are correlated with increased cessation rates.	Pelletier et al., 2014	13/3,486	Substance use (Tobacco)

Results and the number of studies/participants for each model and their respective efficacy for their reviewed health outcome within different healthcare settings. Abbreviations: ACT (Acceptance and Commitment Therapy), AUDIT (Alcohol Use Disorders Identification Test), BAC (blood alcohol concentration), BACP (British Association for Counseling and Psychotherapy), BI (Brief Intervention), CBT (cognitive behavioral therapy), CC (collaborative care), CCM (Collaborative Chronic Care Model), CL (consultation liaison), CPMH (Patient-centered Medical Home), ED (Emergency Department), IPT-P (Inter-personal psychotherapy adapted for pain), MAST (Michigan Alcoholism Screening Test), MHP (mental health promotion), MHS (mental health specialists), MI (motivational interview), MORE (Mindfulness Oriented Recovery Enhancement), NLSM (nurse-led self management), PA (physician assistant), PCP (primary care provider), PST (problem-solving therapy), QOL (quality of life), SBI (screening and brief intervention), SBIRT (screening, brief intervention, and referral to treatment), SCT (social cognitive theory), TM (Transtheoretical Model). Studies highlighted for quality: green (excellent), yellow (good), orange (moderate), and red (poor)

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CBT, PST, MI, counseling, and psychotherapy in PC demonstrated significant improvements in depression compared to usual care (Cuijpers et al., 2009; Linde et al., 2015; Zhang et al., 2018). PST demonstrated meaningful improvement in depression and anxiety in PC settings (Zhang et al., 2018). Psychological and educational interventions in PC settings demonstrated moderate significant effect in preventing depression symptoms with limited long-term effect (Conejo-Ceron et al., 2017). Mindfulness Oriented Recovery Enhancement (MORE), ACT, and CBT combined with MI demonstrated efficacy in improving chronic pain symptoms, comorbid depression, and SUD in various combinations in PC and specialty care settings (Barrett & Chang, 2016). MORE also demonstrated efficacy in reducing pain severity (Barrett & Chang, 2016). MI demonstrated some efficacy in the ED for alcohol consumption, at least as compared with brief interventions (Kohler & Hofmann, 2015). However, specific components and delivery of MI vary and there is insufficient evidence to support its overall effectiveness in targeting substance use, blood pressure, diet, or physical activity (Morton et al., 2015; VanBuskirk & Wetherell, 2014). CBT demonstrated clinically relevant improvements in Fibromyalgia Syndrome symptoms in PC and specialty care (Bernardy et al., 2018). Multi-component interventions in PC were shown to be more effective than usual care and counseling alone for maintenance of tobacco cessation (Martin Cantera et al., 2015). There was inconclusive evidence for the efficacy of MORE for treating low back pain in specialty care settings (Cramer et al., 2012) and insufficient evidence for nurse-led self-management (NLSM) targeting Chronic Obstructive Pulmonary Disease (COPD) in PC settings (Baker & Fatoye, 2017).

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Brief Interventions

Brief interventions (BI) were as defined by the reviewed authors. A total of ten reviews assessed BI. Four included a mix of specialists and non-specialist targeting alcohol use using screening and brief interventions (SBI) in the ED (Schmidt et al., 2016), the ED and inpatient care (IP) (Bray, Cowell, & Hinde, 2011), and PC (Keurhorst et al., 2015). Two used a mix of therapies in PC targeting depressive and anxiety disorders (Cape 2010a) and alcohol use (Alvarez-Bueno et al., 2015), and one used an ultra-BI to target alcohol use in the ED (McGinnes et al., 2016). Three delivered SBI by non-specialists only in the ED (Elzerbi et al., 2017), ED and PC (Kaner et al., 2009), and PC (Jonas et al., 2012) targeting alcohol use, and one used a mix of therapies by specialists only in PC targeting tobacco use (Wray et al., 2017).

Effective brief mixed therapies for treating depression in PC included CBT, PST, and counseling (Cape et al., 2010a). Brief CBT was also demonstrated as effective for decreasing anxiety (Cape et al., 2010a). MI was moderately effective in decreasing alcohol use in PC irrespective of who delivered the intervention (Alvarez-Bueno et al., 2015). Reviews on screening and brief interventions (SBI) and ultra-brief interventions indicated that there was little to no significant effect or insufficient evidence for alcohol use in PC, ED, or IP settings regardless of deliverer (Bray et al., 2011; Elzerbi et al., 2017; Keurhorst et al., 2015; McGinnes et al., 2016; Schmidt et al., 2016). One review found SBI with behavioral counseling did moderately improved drinking behavior and suggested some evidence of reduced hospital days for non-alcohol independent risky drinking adults (Jonas et al., 2012). Another review indicated that SBI in PC and ED

settings did reduce the alcohol consumption in men, but had insufficient evidence for a similar effect in women (Kaner et al., 2009). No BI therapy was associated with decreases in tobacco use when delivered in primary care by a specialist only (Wray et al., 2017).

Complex Interventions

As noted by Cantera et al., there is no consensus for the definition of what constitutes a complex intervention (Martin Cantera et al., 2015). For the purpose of this review, complex interventions are defined as interventions in which there are two or more interacting intervention components (e.g. electronic record keeping, therapeutic interventions) with some form of shared care or collaboration between multiple care givers.

A total of nineteen reviews were categorized as complex interventions. Of these, nine assessed the effectiveness of Collaborative Care (CC) for patient with depressive disorders (Coventry et al., 2014; Grochtdreis et al., 2015; Hsiang et al., 2017; Hudson et al., 2016; Jacob et al., 2012; Panagioti et al., 2016; Sighinolfi et al., 2014; van Steenbergen-Weijenburg et al., 2010; Watson et al., 2013), one for patients with depressive and anxiety disorders (Archer et al., 2012), one for patients with depressive disorders and comorbid diabetes (Huang et al., 2013), and one for patients with comorbid depressive and somatoform disorders (van der Feltz-Cornelis et al., 2010) in PC settings. Two reviews assessed CC in PC and IP settings targeting patients with depressive disorders (Thota et al., 2012) and comorbid Coronary Heart Disease (CHD) (Tully & Baumeister, 2015). One review assessed a Collaborative Chronic Care Model

for mental health in PC and specialty settings (Woltmann et al., 2012), two reviews assessed consultation liaisons in the PC setting for mental disorders (Gillies et al., 2015) and depressive disorders (Cape et al., 2010b), one assessed shared care on depression and other chronic health conditions in PC (S. Smith et al., 2017), and one assessed effectiveness of Patient-centered Medical Homes (PCMH) in PC settings (Jackson et al., 2013) (Table A-5).

CC was associated with improved depression symptoms with or without anti-depressant medication (Coventry et al., 2014; Thota et al., 2012), improved depression treatment adherence (Hsiang et al., 2017), improved social functioning (Hudson et al., 2016), improved depression outcomes for patients with and without comorbid physical conditions (Hsiang et al., 2017; Panagioti et al., 2016; Sighinolfi et al., 2014), improved quality of life (Tully & Baumeister, 2015; Watson et al., 2013), improvements in anxiety and depression (Archer et al., 2012), improved adherence to antidepressants and hypoglycemic medication (Huang et al., 2013), reduction in utilization of healthcare resources and effective in reducing depression and somatoform disorders (van der Feltz-Cornelis et al., 2010), and a reduction in major adverse cardiac events in the short-term (Tully & Baumeister, 2015). Only one review assessed non-depression outcomes and concluded there was insufficient evidence for the efficacy of CC on other medicine-related health outcomes (Watson et al., 2013). Results regarding the cost effectiveness for CC varied. One review identified it as a good economic value for managing depression (Jacob et al., 2012), one indicated CC had no benefit to healthcare costs (Tully & Baumeister, 2015), and two reviews indicated there was insufficient evidence

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to confirm its effectiveness (Grochtdreis et al., 2015; van Steenbergen-Weijenburg et al., 2010). One review identified a small to medium effect of the collaborative chronic care model on clinical symptoms, mental and physical quality of life, and social role function with no net increase in total healthcare costs (Woltmann et al., 2012).

Two reviews examined consultation liaisons (CL). One review indicated there was evidence that CL was associated with short-term mental health improvements and 12-months adherence improvement, but CL was less effective than CC in improving mental disorder symptoms, general health status, and provision of treatment (Gillies et al., 2015). However, Gillies et al. did note that overall treatment evidence for the effectiveness of CC was modest (Gillies et al., 2015). The other review indicated CL had no significant effect on antidepressant use or depressions outcomes (Cape et al., 2010b). Shared care was demonstrated to improve depression outcomes, however, it had mixed results for other health and economic outcomes (S. Smith et al., 2017). There was insufficient evidence to determine the efficacy of Patient-centered Medical Homes (PCMH) (Jackson et al., 2013).

Computer-based Interventions

Models in which a computer, smartphone, or other-technology based device was the key component for treatment delivery were categorized as computer-based interventions. There were four reviews assessing computer-based interventions. Two of these were delivered by a mix of specialists and non-specialists, of which one review assessed the effectiveness of internet-based interventions on Coronary Heart Disease (CHD) in PC, specialty, and IP settings in which evidence was inconclusive regarding its

effectiveness (Devi et al., 2015). The other assessed technology-assisted interventions for weight loss in PC, which was associated with increased weight loss (Levine et al., 2015). However, best practices for technology-assisted intervention were not distinguished (Levine et al., 2015). Two reviews assessed interventions delivered by non-specialist only. One assessed computer-based screening, interventions, and referrals for substance use and mental health conditions in ED settings, in which there was evidence of efficacy in reducing high-risk alcohol use, but had limited clinical outcomes (Choo et al., 2012). The other review assessed digital and computer-based alcohol interventions in PC, ED, and IP settings (Nair et al., 2015). These were found to be effective in reducing alcohol consumption, but were not moderated by interventions that provided opportunities to monitor drinking over time (Nair et al., 2015).

Non-specific Interventions

One review assessed multiple approaches for interventions in the ED setting. These included brief, behavioral, and computer-based interventions and were correlated with increase tobacco cessation rates (Pelletier, Strout, & Baumann, 2014).

Discussion

Providing integrated healthcare has been suggested to improve both physical and behavioral health outcomes for those with comorbid physical and behavioral health conditions, as well as decrease their overall financial burden on the healthcare system (Johnson et al., 2015; B. Miller et al., 2017). Integrated healthcare models vary greatly in both setting and approach, with little consensus as to which models are best for specific healthcare settings. This review systematically gathered and reported the

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efficacy, setting of application, and the healthcare deliverer of these models from the most current systematic reviews. The variation between and within models differed in treatment type, treatment length, treatment frequency, treatment exposure time, treatment delivery, setting, type and number of healthcare providers, use of technology, targeted health outcome, and interactions between intervention components.

Overall, collaborative care (CC) appears to have the greatest efficacy in improving health outcomes. However, the majority of reviews assessing CC focus on depression and depression-related health outcomes, resulting in limited evidence for its effectiveness in improving other behavioral or physical health conditions.

The economic burden of depression has been estimated at $210 billion a year in 2010 (Greenberg et al., 2015) and comorbid depression has been the focal point for many of the initial projects supported by the organizations (e.g. John A. Hartford Foundation, the John D. and Catherine T. MacArthur Foundation, the Robert Wood Johnson Foundation, and the Hogg Foundation for Mental Health) that have helped define the field of integrated healthcare (Collins et al., 2010), so it is not unexpected that research assessing non-depression related health outcomes is not as prominent within the literature.

Compared to brief interventions (BI) and behavioral interventions, CC is much more difficult to integrate and coordinate in healthcare systems. BI provides a flexible opportunity for healthcare providers to briefly connect with their patients on site and at the time of an appointment, with little prep time and comparably less provider training. However, it should be noted that data do indicate some training is an essential

component to BI efficacy (Bower et al., 2011; A. Fernandez et al., 2015; VanBuskirk & Wetherell, 2014; Zhang et al., 2018). Behavioral interventions are more involved with regard to time spent with the patient and training for the provider, and, although frequently initiated in PC and ED settings, behavioral interventions are often performed in a secondary setting with a trained professional, typically resulting from a more systematic screening and referral process as compared to usual care. Collaborative care on the other hand, is much more complex.

Definitions for CC vary, but several characteristics remain constant that make coordinating CC much more resource intensive. These include a healthcare professional who is trained in care management, a trained mental health care provider, a structured management plan, shared record keeping/documentation, and feedback between the caregivers and the patient. Tables A-2, A-3, and A-4 provide more detail information regarding the CC definitions and approaches reviewed in this paper.

Complex interventions offer several advantages in terms of longer-term and multidisciplinary team-base support that BI and behavioral therapy-based interventions do not provide. However, this difference does come at a cost. Complex interventions are much more resource intensive. They require additional training (Jacob et al., 2012), additional care providers and care managers, provider buy-in and role distinctions (also applicable to all the approaches reviewed in this paper) (Buche et al., 2017; Rieckmann et al., 2017), and changes in workflow and physical environment logistics (Buche et al., 2017). Further applicable to all approaches, patient buy-in is a key resource for success, which is often difficult to obtain due to social stigma for treatment (Edmond et al., 2016;

Stuart et al., 2017), financial issues (Maclean & Saloner, 2018), denial (Glass et al., 2017b; Stuart et al., 2017), and skepticism of treatment (R. Frank & McGuire, 2000). Complex interventions such as CC also run into substantial financial barriers. Although this review does not provide evidence to support claims of cost off-setting and over-all increased return on investment (Jacob et al., 2012; Thota et al., 2012; SAMHSA, 2013) from CC. Additionally, many organizations have found it difficult to receive reimbursements from payers for integrative care services due to fee-for-service contracts that have not provided coverage for these services (V. Lewis et al., 2014; Raney, 2015). However, HMO healthcare systems like Kaiser Permanente and accountable care organizations that operate on capitated or capitate-like health plans are well-suited for implementing integrated health care (Minkoff & Gordon, 2016) and have demonstrated positive cost benefits (V. Lewis et al., 2014; Melek et al., 2014; Stuart et al., 2017). It should be noted that in November of 2016 the Centers for Medicare & Medicaid Services (CMS) released their 2017 Medicare Fee Schedule that included additional payment options for receiving reimbursement for integrated services under a fee-for-service model (CMS, 2017). As such, current data are not available on the financial return associated CMS's decision to begin reimbursement for integrated care, but this decision does represent the elimination of a significant financial barrier (Thorpe et al., 2017).

For most of the reviewed health outcomes there seems to be no significant difference between the efficacy of behavioral interventions and BI. This suggests that BI may provide less complex opportunity for healthcare professionals to provide some

integrated care in settings where extended exposure to patients may not be possible, specifically regarding substance use. However, overall evidence of the benefits of BI is mixed and its application should be customized to its specific setting. There is currently little evidence to support the use of interventions that rely on solely on technology. The reviews assessed within this study indicate there are some beneficial components to computer-based interventions (e.g. behavior monitoring) that may contribute to positive health outcomes (Levine et al., 2015; Nair et al., 2015), but best-practices have yet to be defined.

Limitations

Since this document reviews 50 previous systematic reviews containing 783 individual studies, heterogeneity among studies was vast. Such variability includes study design, number of participants and demographics, research staff, therapy type, screening and referral procedures, setting, administrative support, analytic designs, training, control groups, effect sizes, and intervention approach. Table 1 provides a list of key components for heterogeneity as defined by the systematic review's respective author. Additionally, many of these studies lack long-term outcomes (Bower et al., 2011; S. Smith et al., 2017), control groups or definition of control groups (McGinnes et al., 2016; S. Smith et al., 2017; Thota et al., 2012), standardized treatment and treatment components (Bower et al., 2011; S. Smith et al., 2017), standardized definitions of setting and interventions (Atun et al., 2011; Cape et al., 2010a; Watson et al., 2013), assessments of best practices (Morton et al., 2015), robust sample sizes (VanBuskirk & Wetherell, 2014; Wray et al., 2017), and definitions and measurements of cost, economic

value, and attribution of costs outcomes with intervention components (Jacob et al., 2012; S. Smith et al., 2017). Further, many of these reviews were subject to methodological issues publication bias (Jacob et al., 2012), response bias (Bower et al., 2011), selection bias (Thota et al., 2012), external validity and generalizability (S. Smith et al., 2017), regression to the mean (Kohler & Hofmann, 2015), and selection bias. Finally, this review does not attempt to re-evaluate or detail the results of all the trials and studies identified within the systematic reviews. Results reported within this paper were summarizations of key findings within each systematic review. Although this methodology of reporting exposes results to reporting bias, this was a necessary decision in order to meet the purpose of this paper: to provide reference material for healthcare organizations for the range of models on integrated healthcare approaches and their effectiveness across healthcare setting.

Conclusion

Integrated healthcare can be provided to patients using a variety of methods, which range from brief and infrequent behavioral theory-based interventions to more complex and resource-intensive care coordination. Behavioral and brief interventions have been shown to be similarly effective across healthcare settings, but their overall efficacy seems to be limited and specific best practices are yet to be determined. Collaborative care has been shown to be more consistently effective in improving health outcomes despite a lack of consensus for its economic return. However, recent changes in CMS reimbursement schedules have decreased many of the financial barriers associated with the affordability of collaborative care, opening the door to more

opportunities for healthcare organizations integrate collaborative care management

within their systems and provide more evidence for its economic benefit.

CHAPTER III

INTEGRATED CARE SERVICE ACCESS AT SUBSTANCE USE DEPENDENCY

TREATMENT FACILITIES

Introduction

In 2017, the National Survey on Drug Use and Health (NSDUH) indicated that

22.7% of adults reported having a behavioral health disorder, 31.7% (7.2% of total

surveyed) of those with a behavioral health disorder had a substance use dependency

(SUD) disorder, and only 21% of those with a SUD actually attended SUD treatment

(SUDt) within the past year (SAMHSA, 2017a). According to Minkoff & Gordon

(2016), approximately 68% of individuals with behavioral health conditions also have

co-occurring physical health conditions (Minkoff & Gordon, 2016), and the National

Institute on Drug Abuse (NIDA) estimate the current cost of healthcare for substance

abuse (alcohol, tobacco, illicit drugs, and prescription opioid use) is approximately $246

billion a year, with a total estimated societal cost of over $740 billion a year (NIDA,

2017).

SUD encompass a wide range of chronic and acute misuse of alcohol, tobacco,

and illicit and prescription drugs (e.g. marijuana, cocaine, opioids, etc.) and the specific

health implications for such misuse can vary greatly. For example, tobacco use is

associated with increased risked of diabetes, rheumatoid arthritis, lung cancer,

cardiovascular disease, colorectal cancer, and impaired immune function (HHS, 2014).

Chronic alcohol use is associated with high blood pressure, heart and liver disease,

impaired learning and memory, and mouth, breast, throat, esophagus, and colon cancers (WHO, 2014; J. Miller et al., 2007; Rehm et al., 2010). Additionally, those with SUDs are less likely to receive health counseling (Desai et al., 2002) and attend medical office visits (Cradock-O'Leary et al., 2002). Further, in a systematic review on the medical care of patients with comorbid mental illness and SUDs, Mitchell et al. stated that 10 of 10 studies reviewed involving substance misuse demonstrated inequalities of medical care delivery, including cardiovascular care and internal medical care (Mitchell, Malone, & Doebbeling, 2009).

There are a number of strategies currently employed that help address the physical and psychological needs for patients with comorbid physical and behavioral health issues. These include collaborative care models (Ducharme et al., 2016; Raney, 2017; Saitz et al., 2013; Thorpe et al., 2017; Zwar et al., 2017), SBIRT (screening, brief intervention, and referral) (Babor et al., 2007), clinical liaisons (Ducharme et al., 2016), and illness management and recovery (Mueser et al., 2002). However, the efficacy of these interventions varies greatly, and of those that do demonstrate positive results tend to focus more on anxiety and depression, as opposed to SUDt (Hercules et al., 2019a).

Of the healthcare organizations that do provide integrative behavioral care services, many of these services are located within primary care settings (Minkoff & Gordon, 2016; Resnicow et al., 2015; Rieckmann et al., 2017; Rutten et al., 2014; Thorpe et al., 2017; Wadden et al., 2014). Although this is seemingly a step in the right direction toward access to total integrated care, providers in these settings often perform poorly in behavioral screening, assessments, counseling, and referrals (Kim et al., 2017;

Minkoff & Gordon, 2016; Rieckmann et al., 2017; Sahker & Arndt, 2017). Further, many of these services are not immediately available or even on site, and often result in poor behavioral treatment rates (Abraham, Lewis, & Cucciare, 2017; Buche et al., 2017; Cucciare & Timko, 2015). This may be a result of a variety of barriers including poor screening, identification, and referral of those with behavioral healthcare needs to behavioral health treatment (Agley et al., 2014; McLellan & Woodworth, 2014; Minkoff & Gordon, 2016; Saitz et al., 2013), a lack of physician/provider time, training, and motivation for behavioral healthcare practices (V. Lewis et al., 2014; Rieckmann et al., 2017), or alternatively, they may just not be effective. Fortunately, these barriers are not typically present at SUDt facilities, because SUDt specialists are better equipped for behavioral healthcare needs (Buche et al., 2017; Glass et al., 2017a; McLellan & Woodworth, 2014). Further, since most SUDt involves intensive inpatient or outpatient treatment for patients who have already been identified as needing behavioral health treatment, the challenges associated with screening and referring these patients from physical healthcare settings to behavioral healthcare settings are not present at SUDt facilities (SAMHSA, 2016). This creates an opportunity for SUDt facilities to provide the support services needed for high quality integrative health care for their patients.

Given the significance of this opportunity, it is a noteworthy that few studies have provided any data on the prevalence of integrative physical care support services at SUDt facilities. As such, the objective of this study is to assess the availability of integrated care services offered in SUDt facilities in 2014, 2015, 2016, and 2017. The integrated care services compared in this study include primary care services, diet and

exercise counseling, and chronic disease management. These services were chosen because they represent access to disease prevention, health maintenance, education and counseling, and diagnosis and treatment for chronic and acute illness. The provision of these services in coordination with behavioral health services represent a continuum of integrated care for patients, and provide patients who have comorbid physical and behavioral health conditions with access to coordinated healthcare.

The objective of this study was to examine each type of behavioral health treatment facility that offered SUDt in 2014, 2015, 2016, and 2017, and compare rates of access to chronic disease management, integrative primary care services, and diet/exercise counseling between different types of SUDt facilities adjusting for potential confounding factors. Differences in rates of access to chronic disease management, integrative primary care services, and diet/exercise counseling between different types of SUDt facilities were predicted within each survey year. Additionally, no significant changes in access within each facilities type were predicted between years 2014, 2015, 2016, and 2017.

Methods

Data

This study uses the publicly available 2014, 2015, 2016, and 2017 National Mental Health Services Survey (NMHSS) data collected by the Substance Abuse and Mental Health Services Administration (SAMHSA) (SAMHSA, 2014; SAMHSA, 2015; SAMHSA, 2016; SAMHSA, 2017b). This annual survey collects data on the numbers and characteristics of all known mental health treatment facilities in the US and US

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territories. This dataset was selected because it is the only publicly available source of national and state-level data on mental health service providers. Exclusion criteria include: (1) Department of Defense (DoD) military treatment facilities; (2) individual private practitioners or small group practices not licensed as a mental health clinic or center; and (3) jails or prisons. The combined dataset includes a total sample size of 51,983 eligible facilities. This included 13,176, 12,826, 14,399, and 11,582 provider facilities from 2014, 2015, 2016, and 2017 respectively. All eligible facilities were deidentified by SAMHSA each year, which prevented this study from tracking facilities over time. As a result, each survey year was treated as an independent sample distinguished by year and were merged based on measures relevant to this study.

Variables

Chronic disease/illness management (CDM), integrated primary care services (IPC), and diet and exercise counseling (DEC) were used as the response of interest because they cover primary acute/non-acute and secondary non-acute physical care services. CDM, IPC, and DEC were binary measures self-reported by a SUDt facility administrator at each facility participating in the NMHSS. A service was either offered or not offered by each facility. Selection criteria included behavioral health facilities that offer SUDt for adult patients and accept either Medicare or Medicaid in Medicaid-expanded states as a form a payment. This payment criterion was used because these physical care services are all covered under state (Medicaid) and federal (Medicare) funding sources. This allowed the elimination of integrated care service reimbursement as a confounding variable, as the expense of these services often act as a barrier to their

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availability within SUDt facilities and their use among patients. The NMHSS dataset includes eleven different facility type categories. For the purpose of this study, these were reduced to nine categories. Facility type groups include: 1=psychiatric hospitals, 2=separate inpatient psychiatric unit of general hospitals (SIPUGH), 3=residential treatment centers for adults, 4=residential treatment centers that treated both adults and children, 5=Veterans Administration Medical Centers (VAMC), 6=Community Mental Health Centers (CMHC), 7=partial hospitalization/day treatment (PHP), 8=outpatient mental health facilities (OP), and 9=multi-setting mental health facilities (MSMH). Residential treatment centers that exclusively treated children were excluded from the analysis because they do not treat adult patients. Facility category 'Other' was removed due to small sample size and ambiguity. The exclusion of these two categories resulted in the removal of 38 and 14 observations respectively. SAMSHA definitions for the original ten types of facilities can be found in the appendix (Table A-6) (SAMHSA, 2017b). Four additional binary variables (yes and no) were created to distinguish the facilities that offered none, only one, any two, or all three of the services of interest.

Data Management

NMHSS datasets from each year were merged into a single dataset and an additional variable for the corresponding year was created. Publicly available information published online by the Centers for Medicare & Medicaid (CMS) was used to identify which states were participating in Medicaid expansion during their respective survey year (CMS, 2019). States participating in Medicaid expansion within the survey period of each year were considered as Medicaid expanded states and a binary variable

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(yes and no) was created to identify them. Facilities that did not have a response for any of the covariates measured were dropped from the analysis. Only facilities that offered SUDt were measured. In order to determine if age groups (18 to 25, 26 to 64, and 65 or older) had a significant association with services offered, multivariate analysis using logistic regression was performed for each service with each age group for each survey year. Due to overlap in facilities reporting treatment for multiple age groups and a lack of consistent significant differences (two-tailed, alpha <0.01) between age groups, age groups were removed from the model. All facilities that offered treatment for adults (18 to 65+) were included in the analysis.

Analyses

The objective of this study was to examine each type of behavioral health treatment facility that offered SUDt between 2014 and 2017, and compare rates of access to integrated care services between different types of SUDt facilities. The NMHSS datasets did not include unique identifiers for facilities across survey years. According to SAMHSA representatives, this was deliberate in order to protect the anonymity among reporting facilities, resulting in each survey year being treated as an independent sample. Subsequently, since the facilities are independent and the response of interest are the probabilities of being in a given group, we performed Beta-regression. Additionally, because these samples varied independently each year, no facility type could act as a consistent reference group for regression between each year. Therefore, a mean baseline reference group (facility type) was created that reflected the mean response for all facility types for a given service for each survey year. Proportions used

specifically for beta-regression included this mean baseline which allowed the rates, or odds, of a facility offering a service to be calculated using a consistent baseline reference group between independent samples each year. Proportions for each service offered were created using StataSE15 and were distinguished by facility type and year among facilities that offered adult SUDt services and accepted either Medicare or Medicaid (in Medicaid expanded states). In order to maintain the accuracy in the actual proportions of reported access, the baseline reference group was excluded from summary and proportion statistics.

Using the model: *Log(μ/(1-μ)) = B0+B1*FacilityType + B2*Year + B3*Year*FacilityType*, beta-regression was performed in StataSE15 (two-tailed, alpha <0.01) to create coefficients for determining odds. Coefficients were then exported into Excel™ where calculations were performed to estimate odds of a type of facility offering a service at a given year using the exponential of the model: *e^(B0+B1*FacilityType + B2*Year + B3*Year*FacilityType)*. Changes in odds for each year were determined by subtracting the current year odds minus the previous year odds for each facility type. Negative values indicate a decrease in odds for a service compared to the previous year.

Results

Population

After filtering for adult facilities that offered SUDt and accepted either Medicare or Medicaid (within Medicaid expanded states) as form of payment, a total of 21,580 respondent facilities were included in this study. Each survey year was an independent

sample with 5,215 facilities in 2014, 5,594 in 2015, 5,405 in 2016, and 5,366 in 2017 (Table 3).

Table 3 Facility Sample Size

Facility Type	2014	2015	2016	2017
Psychiatric hospitals	349	415	404	402
Separate inpatient psychiatric unit of general hospitals	474	528	542	507
Adutlt residential treatment centers	287	284	266	256
Mixed adult/children residential treatment centers	156	14	16	21
Veterans Administration Medical Centers	118	111	131	110
Community Mental Health Centers	1,681	1,637	1,578	1,577
Partial hospitalization and day treatment	1,882	122	132	124
Outpatient mental health facilities	218	2,244	2,153	2,189
Multi-setting mental health facilities	50	239	183	180
Total	5,215	5,594	5,405	5,366

Proportions and Frequencies of Facilities Offering Services

Table 4 illustrates large variations in proportions of access to services offered between facility types within each year and small variations in total access to services between survey years. Facilities that reported offering chronic disease management ranged from 1,203 to 1,133 across survey years and proportions ranged from 17.96 to 65.25% (2014) to 18.75 to 51.15% (2016) among facility types. Facilities that reported offering integrated primary care ranged from 1,476 to 1,553 across survey years and proportions ranged from 16.67% to 85.50% (2016) to 19.67% to 79.28% (2015) among facility types. Facilities that reported offering diet and exercise counseling ranged from 1,733 to 1,956 across survey years and proportions ranged from 22.15% to 89.19% (2015) to 28.61% to 83.05% (2014) among facility types. Overall, VAMCs consistently had the greatest proportions of facilities offering CDM (54.44%), IPC (85.27%) and

DEC (87.92%), PHP had the lowest proportion of access to CDM (20.09%) and IPC (19.54%), and OP had the lowest proportion of access to DEC (28.31%).

Table 5 illustrates large variations in proportions of access to the number of services offered between facility types within each year and small variations in total access to the number of services offered between survey years. Facilities that reported offering no services ranged from 2,448 to 2,941 across survey years and proportions ranged from 1.80 to 62.43% (2015) to 5.08 to 54.94% (2014) among facility types. Facilities that reported offering only one service ranged from 1,371 to 1,430 across survey years and proportions ranged from 11.45 to 43.75% (2016) to 20.37% to 34.51% (2015) among facility types. Facilities that reported offering only two services ranged from 775 to 805 across survey years and proportions ranged from 10.83% to 41.82% (2017) to 10.47% to 25.74% (2014) among facility types. Facilities that reported offering only three services ranged from 503 to 561 across survey years and proportions ranged from 6.48% to 60.17% (2014) to 6.05% to 44.14% (2015) among facility types. Overall, 55.64% of OP and 54.30% of CMHCs facilities did not offer any service. VAMCs offered the most services across all survey with 33.97% offering only two and 48.74% offering all three services.

Table 4 Proportions by type of integrated care service. *n=number of facilities offering the service for that year (and total number of facilities for that year); percentage totals=the proportions of facilities that offer the service during that year.*

Facility Type	2014 %	2014 n (total)	2015 %	2015 n (total)	2016 %	2016 n (total)	2017 %	2017 n (total)	All Survey Years Mean (%)	All Survey Years Total (n)
Chronic Disease Management										
Psychiatric hospitals	26.93%	94 (349)	25.06%	104 (415)	25.25%	102 (404)	25.62%	103 (402)	25.72%	403 (1570)
Separate inpatient psychiatric unit of general hospitals	35.23%	167 (474)	32.01%	169 (528)	29.89%	162 (542)	29.98%	152 (507)	31.78%	650 (2051)
Adult residential treatment centers	26.83%	77 (287)	21.13%	60 (284)	18.80%	50 (266)	22.66%	58 (256)	22.35%	245 (1093)
Mixed adult/children residential treatment centers	27.56%	43 (156)	14.29%	2 (14)	18.75%	3 (16)	19.05%	4 (21)	19.91%	52 (207)
Veterans Administration Medical Centers	65.25%	77 (118)	50.45%	56 (111)	51.15%	67 (131)	50.91%	56 (110)	54.44%	256 (470)
Community Mental Health Centers	21.71%	365 (1681)	21.50%	352 (1637)	22.56%	356 (1578)	22.38%	353 (1577)	22.04%	1426 (6473)
Partial hospitalization and day treatment	17.96%	338 (1882)	18.03%	22 (122)	19.70%	26 (132)	23.39%	29 (124)	19.77%	415 (2260)
Outpatient mental health facilities	26.15%	57 (218)	16.71%	375 (2244)	19.18%	413 (2153)	18.32%	401 (2189)	20.09%	1246 (6804)
Multi-setting mental health facilities	30.00%	15 (50)	26.36%	63 (239)	27.32%	50 (183)	27.22%	49 (180)	27.73%	177 (652)
Total	**23.64%**	1233 (5215)	**21.51%**	1203 (5594)	**22.74%**	1229 (5405)	**22.46%**	1205 (5366)	**22.57%**	4870 (21580)
Integrated Primary Care Services										
Psychiatric hospitals	33.24%	116 (349)	30.60%	127 (415)	32.67%	132 (404)	34.08%	137 (402)	32.65%	512 (1570)
Separate inpatient psychiatric unit of general hospitals	44.94%	213 (474)	37.88%	200 (528)	39.85%	216 (542)	42.80%	217 (507)	41.37%	846 (2051)
Adult residential treatment centers	33.45%	96 (287)	29.58%	84 (284)	25.19%	67 (266)	29.30%	75 (256)	29.38%	322 (1093)
Mixed adult/children residential treatment centers	31.41%	49 (156)	21.43%	3 (14)	18.75%	3 (16)	33.33%	7 (21)	26.23%	62 (207)
Veterans Administration Medical Centers	88.14%	104 (118)	79.28%	88 (111)	85.50%	112 (131)	88.18%	97 (110)	85.27%	401 (470)
Community Mental Health Centers	23.56%	396 (1681)	24.01%	393 (1637)	27.12%	428 (1578)	26.70%	421 (1577)	25.35%	1638 (6473)
Partial hospitalization and day treatment	21.79%	410 (1882)	19.67%	24 (122)	16.67%	22 (132)	20.16%	25 (124)	19.57%	481 (2260)
Outpatient mental health facilities	33.49%	73 (218)	22.55%	506 (2244)	24.01%	517 (2153)	22.98%	503 (2189)	25.76%	1599 (6804)
Multi-setting mental health facilities	38.00%	19 (50)	30.54%	73 (239)	30.60%	56 (183)	32.78%	59 (180)	32.98%	207 (652)
Total	**28.30%**	1476 (5215)	**26.78%**	1498 (5594)	**28.73%**	1553 (5405)	**28.72%**	1541 (5366)	**28.12%**	6068 (21580)

Table 4 *(continued)*

Facility Type	2014		2015		2016		2017		All Survey Years	
	%	n (total)	%	n (total)	%	n (total)	%	n (total)	Mean (%)	Total (n)
Diet and Exercise Counseling										
Psychiatric hospitals	57.02%	199 (349)	50.12%	208 (415)	55.45%	224 (404)	55.72%	224 (402)	54.58%	855 (1570)
Separate inpatient psychiatric unit of general hospitals	57.59%	273 (474)	50.19%	265 (528)	55.72%	302 (542)	54.24%	275 (507)	54.44%	1115 (2051)
Adult residential treatment centers	64.81%	186 (287)	53.52%	152 (284)	55.26%	147 (266)	57.81%	148 (256)	57.85%	633 (1093)
Mixed adult/children residential treatment centers	42.31%	66 (156)	50.00%	7 (14)	50.00%	8 (16)	52.38%	11 (21)	48.67%	92 (207)
Veterans Administration Medical Centers	83.05%	98 (118)	89.19%	99 (111)	88.55%	116 (131)	90.91%	100 (110)	87.92%	413 (470)
Community Mental Health Centers	28.61%	481 (1681)	23.03%	377 (1637)	26.17%	413 (1578)	27.20%	429 (1577)	26.25%	1700 (6473)
Partial hospitalization and day treatment	28.75%	541 (1882)	44.26%	54 (122)	45.45%	60 (132)	45.97%	57 (124)	41.11%	712 (2260)
Outpatient mental health facilities	41.74%	91 (218)	22.15%	497 (2244)	24.94%	537 (2153)	24.39%	534 (2189)	28.31%	1659 (6804)
Multi-setting mental health facilities	42.00%	21 (50)	30.96%	74 (239)	32.24%	59 (183)	36.11%	65 (180)	35.33%	219 (652)
Total	**37.51%**	1956 (5215)	**30.98%**	1733 (5594)	**34.52%**	1866 (5405)	**34.35%**	1843 (5366)	**34.28%**	**7398 (21580)**

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Table 5 Proportions by number of integrated care services offered. *n=number of facilities offering the service for that year; percentage totals=the proportions of facilities that offer any given number of services during that year.*

Facility Type	2014		2015		2016		2017		All Survey Years	
	%	n	%	n	%	n	%	n	Mean (%)	Total (n)
Offers no integrated care service										
Psychiatric hospitals	33.52%	117	37.59%	156	33.17%	134	34.08%	137	34.59%	544
Separate inpatient psychiatric unit of general hospitals	26.37%	125	34.47%	182	29.34%	159	28.60%	145	29.69%	611
Adult residential treatment centers	26.13%	75	37.32%	106	37.22%	99	33.59%	86	33.57%	366
Mixed adult/children residential treatment centers	41.67%	65	50.00%	7	37.50%	6	38.10%	8	41.82%	86
Veterans Administration Medical Centers	5.08%	6	1.80%	2	3.82%	5	4.55%	5	3.81%	18
Community Mental Health Centers	54.55%	917	56.08%	918	53.17%	839	53.39%	842	54.30%	3516
Partial hospitalization and day treatment	54.94%	1034	45.90%	56	46.21%	61	41.94%	52	47.25%	1203
Outpatient mental health facilities	41.28%	90	62.43%	1401	59.36%	1278	59.48%	1302	55.64%	4071
Multi-setting mental health facilities	38.00%	19	47.28%	113	47.54%	87	47.78%	86	45.15%	305
Total	**46.94%**	**2,448**	**52.57%**	**2,941**	**49.36%**	**2,668**	**49.63%**	**2,663**	**49.68%**	**10,720**
Offers only one integrated care service										
Psychiatric hospitals	29.80%	104	31.33%	130	31.68%	128	30.10%	121	30.73%	483
Separate inpatient psychiatric unit of general hospitals	28.69%	136	27.65%	146	31.92%	173	31.76%	161	30.00%	616
Adult residential treatment centers	35.54%	102	34.51%	98	37.22%	99	37.50%	96	36.19%	395
Mixed adult/children residential treatment centers	29.49%	46	28.57%	4	43.75%	7	33.33%	7	33.79%	64
Veterans Administration Medical Centers	13.56%	16	21.62%	24	11.45%	15	7.27%	8	13.48%	63
Community Mental Health Centers	24.99%	420	25.35%	415	25.86%	408	25.62%	404	25.45%	1,647
Partial hospitalization and day treatment	28.11%	529	32.79%	40	34.09%	45	33.87%	42	32.21%	656
Outpatient mental health facilities	29.36%	64	20.37%	457	21.32%	459	22.52%	493	23.39%	1,473
Multi-setting mental health facilities	26.00%	13	25.52%	61	24.59%	45	21.67%	39	24.44%	158
Total	**27.42%**	**1,430**	**24.58%**	**1,375**	**25.51%**	**1,379**	**25.55%**	**1,371**	**25.74%**	**5,555**

Table 5 *(continued)*

Facility Type	2014 %	2014 n	2015 %	2015 n	2016 %	2016 n	2017 %	2017 n	All Survey Years Mean (%)	All Survey Years Total (n)
Offers only two integrated care services										
Psychiatric hospitals	22.64%	79	18.80%	78	23.76%	96	22.14%	89	21.83%	342
Separate inpatient psychiatric unit of general hospitals	25.74%	122	21.21%	112	22.69%	123	23.67%	120	23.33%	477
Adult residential treatment centers	25.44%	73	14.79%	42	14.66%	39	14.45%	37	17.33%	191
Mixed adult/children residential treatment centers	14.74%	23	7.14%	1	12.50%	2	14.29%	3	12.17%	29
Veterans Administration Medical Centers	21.19%	25	32.43%	36	40.46%	53	41.82%	46	33.97%	160
Community Mental Health Centers	12.49%	210	12.52%	205	12.93%	204	12.30%	194	12.56%	813
Partial hospitalization and day treatment	10.47%	197	14.75%	18	11.36%	15	16.94%	21	13.38%	251
Outpatient mental health facilities	16.06%	35	10.56%	237	11.15%	240	10.83%	237	12.15%	749
Multi-setting mental health facilities	24.00%	12	19.25%	46	18.03%	33	17.22%	31	19.63%	122
Total	**14.88%**	**776**	**13.85%**	**775**	**14.89%**	**805**	**14.50%**	**778**	**14.52%**	**3,134**
Offers three integrated care services										
Psychiatric hospitals	14.04%	49	12.29%	51	11.39%	46	13.68%	55	12.85%	201
Separate inpatient psychiatric unit of general hospitals	19.20%	91	16.67%	88	16.05%	87	15.98%	81	16.97%	347
Adult residential treatment centers	12.89%	37	13.38%	38	10.90%	29	14.45%	37	12.91%	141
Mixed adult/children residential treatment centers	14.10%	22	14.29%	2	6.25%	1	14.29%	3	12.23%	28
Veterans Administration Medical Centers	60.17%	71	44.14%	49	44.27%	58	46.36%	51	48.74%	229
Community Mental Health Centers	7.97%	134	6.05%	99	8.05%	127	8.69%	137	7.69%	497
Partial hospitalization and day treatment	6.48%	122	6.56%	8	8.33%	11	7.26%	9	7.16%	150
Outpatient mental health facilities	13.30%	29	6.64%	149	8.17%	176	7.17%	157	8.82%	511
Multi-setting mental health facilities	12.00%	6	7.95%	19	9.84%	18	13.33%	24	10.78%	67
Total	**10.76%**	**561**	**8.99%**	**503**	**10.23%**	**553**	**10.32%**	**554**	**10.06%**	**2,171**

Chronic Disease Management

VAMCs were the only facility type with positive odds for offering CDM. VAMCs were 57%, 31%, and 10% more likely each year (2014, 2015, and 2016 respectively) to offer CDM compared to the mean baseline reference group. However, VAMCs were 8% less likely in 2017 (Table 6). SIPUGH, adult RTCs, and mix RTCs odds decreased each year between 2.38% to 25.5%, while PHPs increased 2.07% to 2.48% each year (Table 6). With changes less than 0.05%, no other facility types demonstrated meaningful changes in odds at each (Table 6).

Integrated Primary Care

VAMCs were the only facility type that had positive odds for offering IPC. VAMCs were 5.64, 5.84, 6.04, and 6.25 times more likely each year (2014, 2015, 2016, and 2017 respectively) to offer IPC compared to the reference group (Table 6). All other facilities were 28% or greater less to offer IPC compared to the reference group each year. Psychiatric hospitals and CMHCs were the only facilities that had increasing odds each year, however, these changes in odds ranged from 1.13% to 2.40% and may not have a noticeable change. Adult and mixed RTCs decreased in odds each year between 2.77% to 3.86% (Table 6). All other facility types, although statically significant, had decreases in odds of less 0.48% to 2.08% each year and may not represent a noticeable change (Table 6).

Table 6 Rates for type of integrated care service offered by type of facility.   *indicates reference group

Integrated Care Service	Estimated Odds (change from previous year)				Coefficient (99% CI)	P Value
	2014	2015	2016	2017		
Chronic Disease Management						
Psychiatric hospitals	0.36	0.35 (-0.0063)	0.34 (-0.0062)	0.34 (-0.0061)	-0.015 (-0.021, -0.010)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.53	0.48 (-0.0414)	0.45 (-0.0381)	0.41 (-0.0351)	-0.080 (-0.084, -0.075)	<0.001
Adult residential treatment centers	0.33	0.30 (-0.0286)	0.27 (-0.0261)	0.25 (-0.0238)	-0.089 (-0.095, -0.083)	<0.001
Mixed adult/children residential treatment centers	0.37	0.30 (-0.0707)	0.24 (-0.0572)	0.19 (-0.0462)	-0.210 (-0.225, -0.196)	<0.001
Veterans Administration Medical Centers	1.57	1.31 (-0.2546)	1.10 (-0.2132)	0.92 (-0.1785)	-0.175 (-0.182, -0.168)	<0.001
Community Mental Health Centers	0.28	0.28 (0.0049)	0.29 (0.0050)	0.29 (0.0051)	0.020 (0.017, 0.024)	<0.001
Partial hospitalization and day treatment	0.22	0.24 (0.0207)	0.26 (0.0226)	0.29 (0.0248)	0.093 (0.087, 0.099)	<0.001
Outpatient mental health facilities	0.22	0.22 (0.0021)	0.22 (0.0021)	0.23 (0.0021)	0.012 (0.008, 0.016)	<0.001
Multi-setting mental health facilities	0.38	0.37 (-0.0025)	0.37 (-0.0025)	0.37 (-0.0024)	-0.004 (-0.012, 0.004)	0.179
Baseline*	0.30	0.30 (-0.0007)	0.30 (-0.0007)	0.30 (-0.0007)		<0.001
Integrated Primary Care						
Psychiatric hospitals	0.47	0.48 (0.0113)	0.49 (0.0116)	0.50 (0.0119)	0.001 (-0.005, 0.006)	0.681
Separate inpatient psychiatric unit of general hospitals	0.72	0.71 (-0.0108)	0.70 (-0.0106)	0.69 (-0.0105)	-0.038 (-0.043, -0.033)	<0.001
Adult residential treatment centers	0.47	0.43 (-0.0386)	0.40 (-0.0354)	0.36 (-0.0325)	-0.109 (-0.115, -0.102)	<0.001
Mixed adult/children residential treatment centers	0.44	0.41 (-0.0323)	0.38 (-0.0299)	0.35 (-0.0277)	-0.099 (-0.114, -0.084)	<0.001
Veterans Administration Medical Centers	5.64	5.84 (0.1944)	6.04 (0.2011)	6.25 (0.2081)	0.011 (0.000, 0.021)	<0.001
Community Mental Health Centers	0.31	0.33 (0.0210)	0.35 (0.0224)	0.37 (0.0240)	0.043 (0.039, 0.047)	<0.001
Partial hospitalization and day treatment	0.28	0.26 (-0.0208)	0.24 (-0.0193)	0.22 (-0.0178)	-0.101 (-0.108, -0.094)	<0.001
Outpatient mental health facilities	0.33	0.32 (-0.0099)	0.31 (-0.0096)	0.30 (-0.0093)	-0.054 (-0.059, -0.050)	<0.001
Multi-setting mental health facilities	0.47	0.47 (-0.0049)	0.46 (-0.0049)	0.46 (-0.0048)	-0.034 (-0.043, -0.025)	<0.001
Baseline*	0.40	0.40 (0.0092)	0.41 (0.0095)	0.42 (0.0097)		<0.001

Table 6 *(continued)*

Integrated Care Service	Estimated Odds (change from previous year)				Coefficient (99% CI)	P Value
	2014	2015	2016	2017		
Diet and Exercise Counseling						
Psychiatric hospitals	1.18	1.19 (0.0127)	1.20 (0.0129)	1.21 (0.0130)	0.025 (0.017, 0.034)	<0.001
Separate inpatient psychiatric unit of general hospitals	1.22	1.20 (-0.0185)	1.18 (-0.0182)	1.16 (-0.0179)	-0.001 (-0.009, 0.007)	0.789
Adutlt residential treatment centers	1.56	1.43 (-0.1248)	1.32 (-0.1148)	1.21 (-0.1056)	-0.069 (-0.079, -0.060)	<0.001
Mixed adult/children residential treatment centers	0.74	0.86 (0.1153)	0.99 (0.1333)	1.14 (0.1540)	0.159 (0.138, 0.180)	<0.001
Veterans Administration Medical Centers	5.34	6.61 (1.2753)	8.19 (1.5801)	10.15 (1.9577)	0.229 (0.209, 0.249)	<0.001
Community Mental Health Centers	0.36	0.36 (-0.0021)	0.36 (-0.0021)	0.35 (-0.0021)	0.009 (0.002, 0.015)	<0.001
Partial hospitalization and day treatment	0.41	0.56 (0.1447)	0.75 (0.1954)	1.02 (0.2639)	0.315 (0.306, 0.324)	<0.001
Outpatient mental health facilities	0.33	0.33 (-0.0044)	0.32 (-0.0044)	0.32 (-0.0043)	0.001 (-0.006, 0.008)	0.726
Multi-setting mental health facilities	0.49	0.50 (0.0109)	0.51 (0.0111)	0.52 (0.0114)	0.037 (0.022, 0.051)	<0.001
*Baseline**	0.56	0.55 (-0.0081)	0.55 (-0.0079)	0.54 (-0.0078)		<0.001

Diet and Exercise Counseling

VAMCs were 5.34, 6.61, 8.19, and 10.15 times more likely each year (2014, 2015, 2016, and 2017 respectively) to offer DEC compared to the reference group and were the most likely to offer DEC compared to all other facilities (Table 6). Psychiatric hospitals, SIPUGHs, and RTCs were between 16% and 43% more likely to offer DEC each year compared to the baseline reference (Table 6). However, only VAMCs, mixed RTCs, and PHPs had statistically and likely observable positive changes in odds each year ranging between 11.53% to 195.77% (Table 6). Adult RTCs had decreases in odds ranging from 10.56% to 12.48% each year (Table 6). All other facilities had a yearly decrease in odds ranging from 0.21% to 1.85% a year and are statistically significant, but were not like to have a noticeable change (Table 6).

Number of Integrated Care Services Offered

Of all types of facilities, CMHCs, PHPs, and OPs were least likely to offer any integrated care service. PHPs were between 14.10% to 20.40% more likely each year to offer one of more service, although downward pattern, and MSMHs were between 5.31% to 6.05% less likely each year to over any service (Table 7). In 2014, VAMCs were the most likely of any facility within any year to offer all three services with 23% greater odds (Table 7). However, VAMCs demonstrated decreasing changes in odds ranging from 12.84% to 19.56% each year (Table 7). PHPs were the only facilities to likely have observable increases in offering one or more service each year with greatest increases in odds of offering one service (4.60%, 5.14%, and 5.74% increase in odd for years 2015, 2016, and 2017 respectively) (Table 7).

Table 7 Rates for number of integrated care service offered by type of facility.   *indicates reference group*

Number services offered at facilities	Estimated odds (change from previous year)				Coefficient (99% CI)	P Value
	2014	2015	2016	2017		
Facilities that offer no integrated care service						
Psychiatric hospitals	0.54	0.54 (-0.0081)	0.53 (-0.0080)	0.52 (-0.0079)	-0.023 (-0.031, -0.015)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.42	0.42 (0.0023)	0.42 (0.0024)	0.43 (0.0024)	-0.002 (-0.009, 0.005)	0.426
Adult residential treatment centers	0.43	0.48 (0.0481)	0.53 (0.0535)	0.59 (0.0595)	0.098 (0.090, 0.107)	<0.001
Mixed adult/children residential treatment centers	0.73	0.70 (-0.0324)	0.66 (-0.0309)	0.64 (-0.0296)	-0.053 (-0.073, -0.034)	<0.001
Veterans Administration Medical Centers	0.04	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0017)	0.034 (0.001, 0.068)	0.007
Community Mental Health Centers	1.23	1.20 (-0.0309)	1.17 (-0.0301)	1.14 (-0.0294)	-0.033 (-0.038, -0.028)	<0.001
Partial hospitalization and day treatment	1.21	1.01 (-0.2040)	0.84 (-0.1696)	0.70 (-0.1410)	-0.192 (-0.201, -0.184)	<0.001
Outpatient mental health facilities	1.46	1.48 (0.0141)	1.49 (0.0143)	1.51 (0.0144)	0.002 (-0.004, 0.008)	0.402
Multi-setting mental health facilities	0.78	0.84 (0.0531)	0.89 (0.0567)	0.95 (0.0605)	0.058 (0.046, 0.070)	<0.001
*Baseline**	0.94	0.95 (0.0073)	0.96 (0.0074)	0.96 (0.0074)		<0.001
Facilities that offer only one integrated care service						
Psychiatric hospitals	0.44	0.44 (0.0019)	0.45 (0.0019)	0.45 (0.0019)	0.022 (0.017, 0.026)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.39	0.41 (0.0263)	0.44 (0.0281)	0.47 (0.0300)	0.083 (0.079, 0.087)	<0.001
Adult residential treatment centers	0.54	0.56 (0.0202)	0.58 (0.0209)	0.60 (0.0217)	0.054 (0.049, 0.059)	<0.001
Mixed adult/children residential treatment centers	0.42	0.47 (0.0495)	0.53 (0.0553)	0.59 (0.0619)	0.129 (0.117, 0.140)	<0.001
Veterans Administration Medical Centers	0.21	0.16 (-0.0440)	0.13 (-0.0347)	0.10 (-0.0273)	-0.220 (-0.230, -0.211)	<0.001
Community Mental Health Centers	0.34	0.34 (0.0043)	0.34 (0.0044)	0.35 (0.0044)	0.030 (0.027, 0.033)	<0.001
Partial hospitalization and day treatment	0.39	0.44 (0.0460)	0.49 (0.0514)	0.55 (0.0574)	0.128 (0.123, 0.133)	<0.001
Outpatient mental health facilities	0.27	0.27 (0.0056)	0.28 (0.0057)	0.28 (0.0058)	0.038 (0.034, 0.042)	<0.001
Multi-setting mental health facilities	0.37	0.34 (-0.0317)	0.31 (-0.0290)	0.29 (-0.0266)	-0.072 (-0.079, -0.064)	<0.001
*Baseline**	0.36	0.35 (-0.0061)	0.34 (-0.0060)	0.34 (-0.0059)		<0.001

Table 7 *(continued)*

Number services offered at facilities	Estimated odds (change from previous year)				Coefficient (99% CI)	P Value
	2014	2015	2016	2017		
Facilities that offer only two integrated care services						
Psychiatric hospitals	0.27	0.27 (0.0070)	0.28 (0.0072)	0.29 (0.0074)	0.024 (0.019, 0.030)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.31	0.31 (-0.0072)	0.30 (-0.0070)	0.29 (-0.0068)	-0.025 (-0.030, -0.020)	<0.001
Adult residential treatment centers	0.29	0.23 (-0.0611)	0.18 (-0.0482)	0.14 (-0.0380)	-0.239 (-0.245, -0.232)	<0.001
Mixed adult/children residential treatment centers	0.17	0.16 (-0.0098)	0.15 (-0.0092)	0.14 (-0.0087)	-0.062 (-0.079, -0.045)	<0.001
Veterans Administration Medical Centers	0.31	0.43 (0.1188)	0.59 (0.1641)	0.82 (0.2267)	0.322 (0.314, 0.329)	<0.001
Community Mental Health Centers	0.14	0.14 (-0.0002)	0.14 (-0.0002)	0.14 (-0.0002)	-0.003 (-0.007, 0.001)	0.073
Partial hospitalization and day treatment	0.12	0.14 (0.0199)	0.16 (0.0232)	0.19 (0.0271)	0.154 (0.148, 0.161)	<0.001
Outpatient mental health facilities	0.13	0.13 (-0.0032)	0.12 (-0.0031)	0.12 (-0.0031)	-0.027 (-0.031, -0.022)	<0.001
Multi-setting mental health facilities	0.28	0.25 (-0.0272)	0.22 (-0.0245)	0.20 (-0.0221)	-0.105 (-0.114, -0.096)	<0.001
*Baseline**	0.17	0.17 (0.0003)	0.17 (0.0003)	0.17 (0.0003)		<0.001
Facilities that offer only three integrated care services						
Psychiatric hospitals	0.15	0.15 (-0.0022)	0.15 (-0.0022)	0.14 (-0.0021)	-0.029 (-0.037, -0.021)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.23	0.21 (-0.0157)	0.20 (-0.0146)	0.18 (-0.0136)	-0.086 (-0.093, -0.079)	<0.001
Adult residential treatment centers	0.14	0.15 (0.0021)	0.15 (0.0022)	0.15 (0.0022)	0.001 (-0.008, 0.010)	<0.001
Mixed adult/children residential treatment centers	0.16	0.15 (-0.0160)	0.13 (-0.0145)	0.12 (-0.0130)	-0.118 (-0.139, -0.097)	<0.001
Veterans Administration Medical Centers	1.23	1.03 (-0.1956)	0.87 (-0.1645)	0.73 (-0.1384)	-0.187 (-0.196, -0.178)	<0.001
Community Mental Health Centers	0.08	0.08 (0.0047)	0.09 (0.0050)	0.09 (0.0053)	0.047 (0.040, 0.053)	<0.001
Partial hospitalization and day treatment	0.07	0.07 (0.0047)	0.08 (0.0050)	0.09 (0.0054)	0.051 (0.041, 0.061)	<0.001
Outpatient mental health facilities	0.08	0.08 (-0.0015)	0.08 (-0.0015)	0.08 (-0.0015)	-0.032 (-0.039, -0.025)	<0.001
Multi-setting mental health facilities	0.08	0.10 (0.0170)	0.12 (0.0206)	0.14 (0.0250)	0.178 (0.164, 0.193)	<0.001
*Baseline**	0.1189	0.12 (0.0017)	0.12 (0.0017)	0.12 (0.0017)		<0.001

Discussion

The data analyses support the hypotheses. Significant variability was found between both type and number of integrated care services offered at each type of SUDt facility. Partial hospitalization, day treatment, and outpatient mental health facilities (PHP), Community Mental Health Centers (CMHC), and outpatient mental health facilities (OP) were consistently among the least likely to offer integrated care services. However, PHPs had the greatest yearly increase in odds for offering diet and exercise counseling (DEC). Among all three services, six of the nine facilities had greater odds of offering DEC compared to chronic disease management (CDM) and integrated primary care (IPC) by 2017. This is likely because DEC services are much more easily offered than CDM and IPC, and often more popular among patients within treatment. However, it should be noted that the secular pattern among all facilities for offering DEC each year was relatively stable with a likely unobservable decrease.

Rates for offering CDM services were lowest among all facilities. PHPs, CMHCs, and OPs were the only facilities to have positive increases in rates for offering CDM, but even PHPs, which had five to ten times greater increases in odds each year compared to CMHCs and OPs, were still not likely to have a noticeable change. Veterans Administration Medical Centers (VAMC) consistently offered the greatest access CDM services each year, and also had decreasing odds for offering CDM each year. Similarly, this decreasing pattern for offering CDM each year was likely not noticeable.

Separate inpatient psychiatric units of general hospital (SIPUG) had low and decreasing rates for offering IPC, likely because these services are typically provided at general hospitals and clinics. It was not surprising to see that VAMCs had the greatest rates for offering IPC. Because they often do not have the facilities or resources to directly support such services on campus, it was also not surprising to see the remaining facilities with lower rates of access to these services.

In general, except for VAMCs, there was a higher proportion of facilities not offering any service compared to offering one or more service individually for all survey years. With nearly half (49.68%) of all SUDt facilities not offering any integrated care service, this demonstrates a clear underservice to patients and opportunity for improving patient health outcomes.

There was a steady pattern across all facilities for increased rates of access for offering two or services each year. Although these patterns are statistically significant, the majority of these changes are not likely noticeable in real-world settings, and when interpreting with the small changes within the mean baseline reference group, are possibly due to secular patterns or noisy data. Either way, there is little evidence to suggest any generalized noticeable increases in rates for offering these services over time.

Providing integrated care services at SUDt facilities requires overcoming several challenges ranging from provider training, billing practices, and facility buy-in (Klein, 2014). However, many facilities are able to overcome these challenges. In particular, the Veterans Health Administration has included collaborative integrated care into their

vision and are actively providing these services throughout their health system. Although reporting specific models for providing these services is out of scope for this paper, in a previous umbrella review on integrated healthcare practice we found that strategies that employ a collaborative care model are demonstrating both positive economic and health outcomes (Hercules et al., 2019a).

Limitations

This study has five key limitations. First, some SUDt facilities may not have reasonable access to physical care providers due to lack of locational proximity (e.g. small town with little healthcare options), and given the unavailability of this information, interpretations of these results should be considered in light of this possibility. Second, some state Medicaid regulations prevent physical and mental health services billing on the same day (Buche et al., 2017). Consequently, access to integrative services may be lower in these states. It is important to note, however, that this study examines the prevalence of access and the changes in rates of access over time, and therefore, specific state billing requirements do not confound results. Third, the ability of a facility to take advantage of economies of scale in providing integrative services could moderate results, and because information on the size of facilities is not provided, results should be interpreted with caution. Fourth, this study does not measure the efficacy, processes, or any iatrogenic effects associated with these services. It should be noted that although the effect of these services may vary from patient to patient, the purpose of this study is to illustrate gaps in care in which access to services are needed in order improve healthcare rather than advocate for specific services.

Finally, the NHMHSS datasets provide a unique opportunity to assess the prevalence of access to multiple integrative healthcare services across the United States. However, due to SAMHSA policies for maintaining anonymity among facilities, provider facilities were deidentified each year. This prevented this study from following specific provider facilities longitudinally. It does not, however, prevent the comparison of means and proportions aggregated by year and facility category, and does not compromise study findings. The NMHSS only accounts for facilities whose SUDt services are of mixed, or secondary focus, and facilities whose primary treatment focus is SUDt were excluded in this survey. This represents a significant loss in response and decreases the ability for generalizing to all SUDt facilities.

Conclusion

Behavioral health comorbidities play a significant role in healthcare spending and population health outcomes. Improving the way healthcare organizations confront behavioral health challenges may result in improved population health improvements and overall cost of healthcare. However, before these improvements can occur, it is necessary to identify the specific opportunities available for improvement. This study demonstrates that patients seeking SUDt do not have adequate access to integrative care services while in treatment, and there is still much opportunity for facilities to improve access and address an important gap in patient care.

CHAPTER IV

ORGANIZATION TOBACCO CULTURE WITHIN SUBSTANCE USE

DEPENDENCY TREATMENT FACILITIES

Introduction

Tobacco use has been declining since the 1960s, with adult use rates decreasing from 42.4% in 1965 to 23.3% in 2000 and 15.1% in 2015 (Giovino, 2002; Jamal, 2016). Tobacco use in substance use disorder treatment (SUDt), though, remains high, with reports ranging from 77% to 95% among patients and 30% to 40% among staff (Christiansen et al., 2016; Delucchi, Tajima, & Guydish, 2009; Fuller et al., 2007; Tajima et al., 2009; Ziedonis et al., 2007). The myriad of negative health consequences of tobacco use are well documented and represent the leading cause of preventable disease in the world (Samet, 2013). Tobacco use has been shown to have a multiplicative synergistic effect with chronic drug and alcohol use in promoting increased risks of many diseases (Maier et al., 1992; Myers, Doran, & Brown, 2007). Concurrent tobacco use increases dependency on, and susceptibility to, drug/alcohol addiction and relapse (Eby, Laschober, & Muilenburg, 2014; McClure et al., 2015; Myers et al., 2007; Sharp, Schwartz, & Novak, 2003; Toussaint et al., 2009; Weinberger et al., 2015). Tobacco use is cross-cue reactive with alcohol and other drugs (promotes equal or enhanced cravings to use drugs and alcohol when using tobacco) (Drobes, 2002; Stritzke et al., 2004; Traylor, Parrish, Copp, & Bordnick, 2011; Verplaetse & McKee, 2016) and including tobacco cessation in SUDt has been shown to yield a 25% increase in abstinence from

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drugs and alcohol (Prochaska, Delucchi, & Hall, 2004). In mental health, premature

death is four times greater for those with drug addictions who smoke as compared to

those who do not smoke (Hser, McCarthy, & Anglin, 1994) and individuals with alcohol

dependency are at greater risk of dying from tobacco use than alcohol use (Hurt et al.,

1996; Prochaska, 2010).

Tobacco Policies Within SUD Treatment Organizations

Given the plethora of negative physical and mental health effects of tobacco use,

it seems counter-intuitive that tobacco treatment in SUDt organizations is not universally

offered (Koch & Breland, 2015). Between 40 to 69% of SUDt organizations integrate

tobacco addiction in dependency treatment either through tobacco cessation counseling

services or pharmacotherapy (Christiansen et al., 2016; Eby et al., 2012; Koch &

Breland, 2015; Tajima et al., 2009); many facilities ask patients about tobacco use, but

only a third offer counseling (Koch & Breland, 2015); and the majority of the facilities

that do offer treatment report placing "very little emphasis" on tobacco cessation (Currie,

Nesbitt, Wood, & Lawson, 2003). Organization-wide tobacco bans also vary in degree

of implementation. As of 2014, 34 states ban tobacco in SUDt, however, these bans

range from partial to organization-wide bans (Shu & Cook, 2015). Currently,

approximately 95% of all SUDt facilities have banned indoor tobacco use according to

state mandates, but only 10 to 20% of these banned tobacco use completely (Eby et al.,

2012; Knudsen, Boyd, & Studts, 2010; Shu & Cook, 2015). Only 30% of SUDt

organizations have outdoor tobacco use restrictions, which are often restricted to

designated locations (Knudsen, Boyd, et al., 2010; Muilenburg et al., 2016; Shu & Cook,

2015). As of 2008, only New Jersey and New York (specifically, New York State Office of Alcoholism and Substance Abuse Services [OASAS]-certified facilities) have complete indoor/outdoor tobacco bans for both patients and employees at SUDt facilities (Eby et al., 2012; Eby & Laschober, 2013; Krauth & Apollonio, 2015; Shu & Cook, 2015). There have been no additional state-level mandates for complete tobacco bans in SUD treatment facilities since then (Eby et al., 2012).

<div style="text-align:center">Tobacco Culture Within SUD Treatment Organizations</div>

The literature on implementing tobacco cessation within SUDt is replete with data supporting tobacco cessation (Fiore et al., 2000; Jha et al., 2013) and prohibiting tobacco use in SUDt (McClure et al., 2015; Weinberger et al., 2015), and there is little disagreement about the psychological and physiological benefits for cessation (Baca & Yahne, 2009; Degenhardt & Hall, 2001; Friend & Pagano, 2005). These practices would not only ethically realign organizations with the principles of addiction recovery (Knudsen, 2016; Williams et al., 2005), but would also substantially increase quality of care and reputation within these healthcare organizations (E. Brown et al., 2012; Williams et al., 2005), while potentially making their treatment programs a better investment for prospective patients and improving future healthcare costs. However, organizational- level barriers such as SUDt tobacco culture have been shown to be a significant hurdle in implementing these practices (Knudsen & Studts, 2010; Knudsen et al., 2010).

Organizational culture is a construct that is typically measured through self-reported perceptions and attitudes of barriers, climate, scenarios, and values (Aarons &

<div style="text-align:center">66</div>

Sawitzky, 2006; Taras, Rowney, & Steel, 2009). The previous studies that have assessed

tobacco culture at SUDt facilities have not deviated from these practices and have

identified an inverse relationship between access to organizational support services for

nicotine addiction treatment and organization tobacco culture (Aarons & Sawitzky,

2006; Knudsen & Studts, 2010). However, these studies have not illustrated the impact

of this culture on the national prevalence of nicotine addiction support services (NASS)

at SUDt facilities. This study examined the national relationship of tobacco culture on

the prevalence of organizational support services for nicotine addiction in SUDt facilities

from 2014 to 2017. Additionally, this study sought to identify the prevalence of

organization tobacco culture using national data on behavioral health services instead of

self-reported measures.

Since [organizational] culture is a construct, attribution of culture must be based

on valid and reliable measurements (Taras et al., 2009). This study makes the

assumption that previous measurements and reported effects of tobacco culture on

nicotine addiction support structure are valid, which supports the attribution of

organization tobacco culture as a potential determinant for nicotine addiction support

services at SUDt facilities. Further, this assumption supports the premise that regardless

of the mandating authority intention (e.g. state laws, parent organizations, etc.), support

services for treating nicotine addiction not accompanied by a tobacco ban must be the

result of a culture that does not highly value the physiological and/or psychological

impact of nicotine addiction in context to comorbid addictions during SUDt. In other

words, facilities that offer support services and do not ban tobacco use are characteristic

of a culture that does not support tobacco cessation. Additionally, because tobacco bans themselves are considered an organizational support structure for nicotine addiction (intended or not), this assumption also implies that likelihood of an organization banning tobacco use should increase with the number of NASS offered. Therefore, the objectives of this study were 1) to determine if access to NASS at SUDt facilities is a proxy indicator for organization tobacco culture, 2) to examine how NASS varies with tobacco bans within SUDt facilities, and 3) to examine the relationship of tobacco culture on the prevalence of NASS between SUDt facilities.

Methods

Data

This study used the publicly available 2014, 2015, 2016, and 2017 National Mental Health Services Survey (NMHSS) data collected by the Substance Abuse and Mental Health Services Administration (SAMHSA) (SAMHSA, 2014; SAMHSA, 2015; SAMHSA, 2016; SAMHSA, 2017b). This annual survey collects data on the numbers and characteristics of all known mental health treatment facilities in the US and US territories. This dataset was selected because it is the only publicly available source of national and state-level data on mental health service providers. Exclusion criteria include: (1) Department of Defense (DoD) military treatment facilities; (2) individual private practitioners or small group practices not licensed as a mental health clinic or center; and (3) jails or prisons. The combined dataset includes a total sample size of 51,983 responses from eligible facilities. This included 13,176, 12,826, 14,399, and 11,582 provider facilities from 2014, 2015, 2016, and 2017 respectively. All eligible

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facilities were deidentified by SAMHSA each year, which prevented this study from tracking facilities over time. As a result, each survey year was treated as an independent sample distinguished by year and samples were merged based on measures relevant to this study.

<center>*Variables*</center>

Tobacco cessation counseling (TCC), nicotine replacement therapy (NRT), and non-nicotine tobacco cessation medication [by prescription] (NTCM), were chosen as responses of interest because they cover all categories of nicotine addiction support services (NASS). TCC, NRT, and NTCM were binary measures self-reported by a SUDt facility administrator at each facility participating in the NMHSS. A service was either offered or not offered by each facility. Tobacco policy was a response variable of interest for the analyses that examined the association between campus-wide tobacco bans and access to NASS. Tobacco policy was also used a selection criterion for the analyses that examined changes in rates of access to NASS across survey years among different types of facilities. Tobacco policy was binary variable and considered present if the facilities had a complete/campus-wide tobacco ban. This would include only facilities that prohibited both indoor and outdoor tobacco use on campus.

Selection criteria included behavioral health facilities that offer SUDt for adult patients and accept either Medicare or Medicaid in Medicaid-expanded states as a form a payment. This payment criterion was used because these physical care services are all covered under state (Medicaid) and federal (Medicare) funding sources. This allowed the study to eliminate integrated care service reimbursement as a potential confounding

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variable, as the expense of these services often act as a barrier to their availability within SUDt facilities and their use among patients. The NMHSS dataset includes eleven different facility type categories. For the purpose of this study, these were reduced to nine categories. Facility type groups include: 1=psychiatric hospitals, 2=separate inpatient psychiatric unit of general hospitals (SIPUGH), 3=residential treatment centers for adults, 4=residential treatment centers that treated both adults and children, 5=Veterans Administration Medical Centers (VAMC), 6=Community Mental Health Centers (CMHC), 7=partial hospitalization/day treatment (PHP), 8=outpatient mental health facilities (OP), and 9=multi-setting mental health facilities (MSMH). Residential treatment centers that exclusively treated children were excluded from the analysis, because they do not treat adult patients. Facility category 'Other' was removed due to small sample size and ambiguity. The exclusion of these two categories resulted in the removal of 38 and 14 observations respectively for a total of 52 observations excluded. SAMSHA definitions for the original ten types of facilities can be found in the appendix (Table A-6) (SAMHSA, 2017b). Four additional binary variables (yes and no) were created to distinguish the facilities that offered none, only one, any two, or all three of the services of interest.

Data Management

NMHSS datasets from each year were merged into a single dataset and an additional variable for the corresponding year was created. Publicly available information published online by the Centers for Medicare & Medicaid (CMS) was used to identify which states were participating in Medicaid expansion during their respective

survey year (CMS, 2019). States participating in Medicaid expansion within the survey period of each year were considered as Medicaid expanded states and a binary variable (yes and no) was created to identify them. Facilities that did not have a response for any of the covariates measured were dropped from the analysis. Only facilities that offered SUDt were measured. In order to determine if age groups (18 to 25, 26 to 64, and 65 or older) had a significant association with services offered, multivariate analysis using logistic regression was performed for each service with each age group for each survey year. Due to overlap in facilities reporting treatment for multiple age groups and a lack of consistent significant differences (two-tailed, alpha <0.01) between age groups, age groups were removed from the model. All facilities that offered treatment for adults (18 to 65+) were included in the analysis.

Analyses

The NMHSS datasets did not include unique identifiers for facilities across survey years. According to SAMHSA representatives, this was deliberate in order to protect the anonymity among reporting facilities resulting in each survey year as an independent sample. Subsequently, since the facilities are independent and the response of interest are the probabilities of being in a given group, we performed Beta-regression. Additionally, because these samples varied independently each year, no facility type could act as a consistent reference group for regression between each year. Therefore, a mean baseline reference group (facility type) was created that reflected the mean response for all facility types for a given service for each survey year. Proportions used specifically for beta-regression included this mean baseline which allowed the rates, or

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odds, of a facility offering a service to be calculated using a consistent baseline reference group between independent samples each year. Proportions for each service offered were created using StataSE15 and were distinguished by facility type and year among facilities that offered adult SUDt services and accepted either Medicare or Medicaid (in Medicaid expanded states). In order to maintain the accuracy in the actual proportions of reported access, the mean baseline reference group was excluded from summary and proportion statistics because the inclusion of it would artificially increase the sample size and misreport proportions.

Using the model: $Log(\mu/(1-\mu)) = B0+B1*FacilityType + B2*Year + B3*Year*FacilityType$, beta-regression was performed in StataSE15 (two-tailed, alpha <0.01) to create coefficients for estimate odds. Coefficients were then extracted and plugged into Excel where calculations were performed to determine odds of a type of facility offering a service at a given year using the exponential of the model:

$e^\wedge(B0+B1*FacilityType + B2*Year + B3*Year*FacilityType)$. Changes in odds for each year was determined by subtracting the current year odds minus the previous year odds for each facility type. Negative values indicate a decrease in odds for a service compared to the previous year. Logistic regression (two-tailed, alpha <0.01) was used for estimating the odds of campus-wide tobacco bans with other forms of NASS. Beta-regression was also performed for estimating the odds for the number of NASS offered at each type of facility (e.g. none, only one, any two, or all three NASS). However, VAMC facility type was excluded from number of NASS beta-regression because the portions of VAMCs that offered only one and any two NASS were zero (i.e. there were

no VAMC facilities within selection criteria for these two categories). The mean baseline reference group was not included for logistic regression.

Results

Population

After filtering for adult facilities that offered SUDt and accepted either Medicare or Medicaid (within Medicaid expanded states) as form of payment, a total of 21,580 respondent facilities were included in this study. Each survey year was an independent sample with 5,215 facilities in 2014, 5,594 in 2015, 5,405 in 2016, and 5,366 in 2017 (Table 8).

Table 8 Facility Sample Size

Facility Type	2014	2015	2016	2017
Psychiatric hospitals	349	415	404	402
Separate inpatient psychiatric unit of general hospitals	474	528	542	507
Adutlt residential treatment centers	287	284	266	256
Mixed adult/children residential treatment centers	156	14	16	21
Veterans Administration Medical Centers	118	111	131	110
Community Mental Health Centers	1,681	1,637	1,578	1,577
Partial hospitalization and day treatment	1,882	122	132	124
Outpatient mental health facilities	218	2,244	2,153	2,189
Multi-setting mental health facilities	50	239	183	180
Total	5,215	5,594	5,405	5,366

Proportions and Frequencies of Facilities Offering Services

Table 9 illustrates large variations in proportions of access to services offered between facility types within each year and small variations in total access to services between survey years. Facilities that reported offering tobacco cessation counseling (TCC) ranged from 2,294 to 2,706 across survey years and proportions ranged from

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37.18% to 50.00% (2014) to 12.50% to 93.13% (2016) among facility types. Facilities

that reported offering nicotine replacement therapy (NRT) ranged from 1,437 to 1,668

across survey years and proportions ranged from15.29% to 88.14% (2014) to 17.28% to

91.60% (2016) among facility types. Facilities that reported offering non-nicotine

tobacco cessation medication (NTCM) ranged from 1,288 to 1,591 across survey years

and proportions ranged from 7.14% to 90.09% (2015) to 21.00% to 91.53% (2014)

among facility types. Facilities that reported offering campus-wide tobacco bans ranged

from 2,202 to 2,518 across survey years and proportions ranged from 13.64% to 91.52%

(2017) to 16.79% to 90.04% (2016) among facility types. VAMCs consistently had the

greatest proportions of facilities offering TCC (92.35%), NRT (89.73%), and NTCM

(91.68%), but had the lowest proportion of campus-wide tobacco bans (14.36%). Mixed

RTCs, CMHCs, PHPs, and OPs were consistently among the lowest in offering any of

the three NASS. SIPUGH and psychiatric facilities had the highest proportion of

campus-wide tobacco bans (89.21% and 57.77% respectively).

Table 9 Proportions by type of NASS. *n=number of facilities offering the service for that year (and total number of facilities for that year); percentage totals=the proportions of facilities that offer the service during that year.*

Facility Type	2014		2015		2016		2017		All Survey Years	
	%	n (total)	%	n (total)	%	n (total)	%	n (total)	Mean (%)	Total (n)
Tobacco cessation counseling										
Psychiatric hospitals	48.14%	168 (349)	62.17%	258 (415)	72.03%	291 (404)	73.13%	294 (402)	63.87%	1011 (1570)
Separate inpatient psychiatric unit of general hospitals	64.14%	304 (474)	76.52%	404 (528)	82.29%	446 (542)	82.84%	420 (507)	76.44%	1574 (2051)
Adult residential treatment centers	48.43%	139 (287)	42.25%	120 (284)	55.26%	147 (266)	58.20%	149 (256)	51.04%	555 (1093)
Mixed adult/children residential treatment centers	47.44%	74 (156)	28.57%	4 (14)	12.50%	2 (16)	28.57%	6 (21)	29.27%	86 (207)
Veterans Administration Medical Centers	89.83%	106 (118)	92.79%	103 (111)	93.13%	122 (131)	93.64%	103 (110)	92.35%	434 (470)
Community Mental Health Centers	37.18%	625 (1681)	35.13%	575 (1637)	41.25%	651 (1578)	43.56%	687 (1577)	39.28%	2538 (6473)
Partial hospitalization and day treatment	39.85%	750 (1882)	46.72%	57 (122)	46.97%	62 (132)	43.55%	54 (124)	44.27%	923 (2260)
Outpatient mental health facilities	47.25%	103 (218)	37.12%	833 (2244)	41.11%	885 (2153)	41.75%	914 (2189)	41.81%	2735 (6804)
Multi-setting mental health facilities	50.00%	25 (50)	36.82%	88 (239)	45.90%	84 (183)	43.89%	79 (180)	44.15%	276 (652)
Total	**43.99%**	**2294 (5215)**	**43.65%**	**2442 (5594)**	**49.77%**	**2690 (5405)**	**50.43%**	**2706 (5366)**	**46.95%**	**10132 (21580)**
Nicotine replacement therapy										
Psychiatric hospitals	58.17%	203 (349)	67.23%	279 (415)	76.24%	308 (404)	73.38%	295 (402)	68.75%	1085 (1570)
Separate inpatient psychiatric unit of general hospitals	72.78%	345 (474)	79.17%	418 (528)	84.13%	456 (542)	85.80%	435 (507)	80.47%	1654 (2051)
Adult residential treatment centers	33.10%	95 (287)	28.52%	81 (284)	29.70%	79 (266)	34.77%	89 (256)	31.52%	344 (1093)
Mixed adult/children residential treatment centers	25.64%	40 (156)	14.29%	2 (14)	25.00%	4 (16)	19.05%	4 (21)	20.99%	50 (207)
Veterans Administration Medical Centers	88.14%	104 (118)	88.29%	98 (111)	91.60%	120 (131)	90.91%	100 (110)	89.73%	422 (470)
Community Mental Health Centers	15.29%	257 (1681)	15.09%	247 (1637)	17.74%	280 (1578)	19.28%	304 (1577)	16.85%	1088 (6473)
Partial hospitalization and day treatment	17.32%	326 (1882)	18.03%	22 (122)	21.21%	28 (132)	18.55%	23 (124)	18.78%	399 (2260)
Outpatient mental health facilities	23.85%	52 (218)	14.35%	322 (2244)	17.28%	372 (2153)	17.04%	373 (2189)	18.13%	1119 (6804)
Multi-setting mental health facilities	30.00%	15 (50)	21.34%	51 (239)	21.86%	40 (183)	25.00%	45 (180)	24.55%	151 (652)
Total	**27.56%**	**1437 (5215)**	**27.17%**	**1520 (5594)**	**31.21%**	**1687 (5405)**	**31.46%**	**1668 (5366)**	**29.25%**	**6312 (21580)**

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Table 9 *(continued)*

Facility Type	2014 %	2014 n (total)	2015 %	2015 n (total)	2016 %	2016 n (total)	2017 %	2017 n (total)	All Survey Years Mean (%)	All Survey Years Total (n)
Non-nicotine tobacco cessation medication										
Psychiatric hospitals	54.73%	191 (349)	42.65%	177 (415)	53.22%	215 (404)	54.98%	221 (402)	51.39%	804 (1570)
Separate inpatient psychiatric unit of general hospitals	61.39%	291 (474)	54.36%	287 (528)	60.33%	327 (542)	63.31%	321 (507)	59.85%	1226 (2051)
Adult residential treatment centers	36.24%	104 (287)	23.59%	67 (284)	22.56%	60 (266)	25.78%	66 (256)	27.04%	297 (1093)
Mixed adult/children residential treatment centers	32.05%	50 (156)	7.14%	1 (14)	12.50%	2 (16)	19.05%	4 (21)	17.69%	57 (207)
Veterans Administration Medical Centers	91.53%	108 (118)	90.09%	100 (111)	92.37%	121 (131)	92.73%	102 (110)	91.68%	431 (470)
Community Mental Health Centers	21.00%	353 (1681)	15.58%	255 (1637)	19.07%	301 (1578)	20.36%	321 (1577)	19.00%	1230 (6473)
Partial hospitalization and day treatment	22.26%	419 (1882)	21.31%	26 (122)	23.48%	31 (132)	20.97%	26 (124)	22.01%	502 (2260)
Outpatient mental health facilities	28.44%	62 (218)	14.57%	327 (2244)	18.16%	391 (2153)	19.37%	424 (2189)	20.14%	1204 (6804)
Multi-setting mental health facilities	26.00%	13 (50)	20.08%	48 (239)	24.04%	44 (183)	27.22%	49 (180)	24.34%	154 (652)
Total	**30.51%**	**1591 (5215)**	**23.02%**	**1288 (5594)**	**27.60%**	**1492 (5405)**	**28.59%**	**1534 (5366)**	**27.36%**	**5905 (21580)**
Campus-wide tobacco ban										
Psychiatric hospitals	56.16%	196 (349)	58.31%	242 (415)	58.42%	236 (404)	58.21%	234 (402)	57.77%	908 (1570)
Separate inpatient psychiatric unit of general hospitals	87.97%	417 (474)	87.31%	461 (528)	90.04%	488 (542)	91.52%	464 (507)	89.21%	1830 (2051)
Adult residential treatment centers	17.42%	50 (287)	21.48%	61 (284)	19.92%	53 (266)	20.31%	52 (256)	19.78%	216 (1093)
Mixed adult/children residential treatment centers	44.23%	69 (156)	71.43%	10 (14)	56.25%	9 (16)	76.19%	16 (21)	62.02%	104 (207)
Veterans Administration Medical Centers	14.41%	17 (118)	12.61%	14 (111)	16.79%	22 (131)	13.64%	15 (110)	14.36%	68 (470)
Community Mental Health Centers	37.60%	632 (1681)	38.97%	638 (1637)	41.19%	650 (1578)	42.99%	678 (1577)	40.19%	2598 (6473)
Partial hospitalization and day treatment	38.79%	730 (1882)	27.05%	33 (122)	25.76%	34 (132)	29.84%	37 (124)	30.36%	834 (2260)
Outpatient mental health facilities	33.03%	72 (218)	40.37%	906 (2244)	41.52%	894 (2153)	43.54%	953 (2189)	39.62%	2825 (6804)
Multi-setting mental health facilities	38.00%	19 (50)	38.49%	92 (239)	37.16%	68 (183)	38.33%	69 (180)	38.00%	248 (652)
Total	**42.22%**	**2202 (5215)**	**43.92%**	**2457 (5594)**	**45.40%**	**2454 (5405)**	**46.93%**	**2518 (5366)**	**44.63%**	**9631 (21580)**

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Odds of Nicotine Addiction Support Services and Campus-wide Tobacco Bans

Table 10 illustrates the estimated odds of facilities having a campus-wide tobacco ban with respect to the number and type of NASS offered. Treatment facilities that had campus-wide tobacco bans were 1.9 times more likely to offer TCC (p<0.001), 2.8 times more likely to offer NRT (p<0.001), 2 times more likely to offer NTCM (p<0.001), and 2.2 times more likely to offer any NASS service (p<0.001) compared to treatment facilities without campus-wide tobacco bans. The odds of a facility offering a campus-wide tobacco ban increased with number of NASS offered. These odds increased from 54% less likely to have campus-wide tobacco bans if the facility offered no NASS (p<0.001) to 2.27 times more likely if the facility offered all three NASS (p<0.001). Facilities that offered TCC were 15 times more likely to offer NRT (p<0.001) and 13 times more likely to NTCM (p<0.001) than those did not offer TCC (Table 10). Facilities that offered NRT were 26.5 times more likely to NTCM (p<0.001) than those that did not offer TCC (Table 10).

Table 10 Estimated odds of one NASS offered compared to other NASS offered. (α=0.01)

NASS	OR	SE	99% CI	*p*-value
Facility-wide tobacco ban				
Tobacco cessation counseling	1.914	0.053	(1.782, 2.056)	< 0.001
Nicotine replacement therapy	2.801	0.087	(2.586, 3.033)	< 0.001
Non-nicotine tobacco cessation medication	1.995	0.062	(1.842, 2.161)	< 0.001
Tobacco cessation counseling, nicotine replacement therapy, or				
non-nicotine tobacco cessation medication	2.167	0.061	(2.016, 2.329)	< 0.001
No NASS	0.461	0.013	(0.429, 0.496)	< 0.001
Only one NASS	0.986	0.033	(0.904, 1.076)	0.702
Only two NASS	1.806	0.075	(1.623, 2.009)	< 0.001
Only three NASS	2.271	0.080	(2.0733, 2.488)	< 0.001
Tobacco cessation counseling				
Nicotine replacement therapy	15.133	0.624	(13.608, 16.828)	< 0.001
Non-nicotine tobacco cessation medication	13.377	0.556	(12.018, 14.889)	< 0.001
Nicotine replacement therapy				
Non-nicotine tobacco cessation medication	26.515	1.060	(23.921, 29.390)	< 0.001

Tobacco Cessation Counseling

With the exception of mixed RTCs and a statistically insignificant result for
CMHCs (p=0.808), results indicate that all facilities had positive increases in odds
(p<0.001) compared to the baseline reference for offering TCC in each survey year
(Table 11). VAMCs had the greatest odds and the greatest change in odds each year
ranging from 11.1 times more likely in 2014 to 15.6 times more likely in 2017 to offer
TCC compared to the mean baseline reference group (Table 11). SIPUGH had the
second greatest range in odds at 2.9 times more likely in 2014 to 5.8 times more likely in
2017 to offer TCC compared to the baseline reference group (Table 11). Of those with
positive patterns each year, OPs had the smallest change in odds each year, ranging from
41% less likely in 2014 to 38% less likely in 2017 (Table 11). Mixed RTCs decreased in
odds each year from 15% less likely to offer TCC in 2014 to 77% less likely to offer
TCC in 2017 (Table 11). Changes in odds each year ranged from 3.9% increase to 170%

increases within all survey years (Table 11), indicating this positive pattern was statistically significant and likely had noticeable changes each year. On average TCC had a pattern of being between 8.6% and 10.6% more likely each year to be offered (Table 11).

<center>*Nicotine Replacement Therapy*</center>

With the exception of mixed RTCs, results indicate that all facilities had positive increases in odds ($p<0.001$) compared to the baseline reference for offering NRT in each survey year (Table 11). VAMCs had the greatest odds and the greatest change in odds each year ranging from 8.4 times more likely in 2014 to 10.9 times more likely in 2017 to offer NRT compared to the reference group (Table 11). SIPUGH had the second greatest range in odds at 2.8 times more likely in 2014 to 6.5 times more likely in 2017 to offer NRT compared to the reference group (Table 11). CMHCs, PHPs, and OPs had the lowest odds of offering NRT ranging from odds of 0.17 to 0.24, 0.21 to 0.25, and 0.18 to 0.21 respectively from 2014 to 2017 (Table 11). Psychiatric facilities, SIPUGH, and VAMCs had positive changes in odds ranging from 44.8% to 161% each year, while the remaining facilities did not see changes greater than 2.4% (Table 11). This indicates that psychiatric facilities, SIPUGH, and VAMC were the only facilities to likely have noticeable annual changes in odds for offering NRT between 2014 and 2017. On average NRT had a pattern of being between 3.1% and 3.6% more likely each year to be offered (Table 11).

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Table 11 Estimated odds for type of NASS offered by type of facility.   *indicates reference group

Type of NASS	Estimated Odds (change from previous year)				Coefficient (99% CI)	p-value
	2014	2015	2016	2017		
Tobacco cessation counseling						
Psychiatric hospitals	1.04	1.51 (0.4706)	2.20 (0.6828)	3.19 (0.9907)	0.266 (0.256, 0.276)	<0.001
Separate inpatient psychiatric unit of general hospitals	2.01	2.86 (0.8440)	4.05 (1.1981)	5.75 (1.7008)	0.244 (0.235, 0.253)	<0.001
Adult residential treatment centers	0.79	0.94 (0.1529)	1.12 (0.1825)	1.34 (0.2179)	0.071 (0.055, 0.087)	<0.001
Mixed adult/children residential treatment centers	0.85	0.55 (-0.2966)	0.36 (-0.1931)	0.23 (-0.1258)	-0.535 (-0.562, -0.508)	<0.001
Veterans Administration Medical Centers	9.38	11.11 (1.7288)	13.15 (2.0475)	15.58 (2.4250)	0.063 (0.011, 0.115)	0.002
Community Mental Health Centers	0.55	0.61 (0.0621)	0.68 (0.0692)	0.76 (0.0770)	0.001 (-0.007, 0.008)	0.808
Partial hospitalization and day treatment	0.67	0.73 (0.0613)	0.80 (0.0669)	0.87 (0.0730)	-0.019 (-0.031, -0.006)	<0.001
Outpatient mental health facilities	0.59	0.63 (0.0394)	0.67 (0.0420)	0.72 (0.0448)	-0.042 (-0.050, -0.034)	<0.001
Multi-setting mental health facilities	0.66	0.70 (0.0419)	0.74 (0.0445)	0.79 (0.0474)	-0.044 (-0.062, -0.027)	<0.001
Baseline*	0.77	0.85 (0.0860)	0.95 (0.0957)	1.06 (0.1064)		<0.001
Nicotine replacement therapy						
Psychiatric hospitals	1.54	1.98 (0.4476)	2.56 (0.5779)	3.31 (0.7462)	0.178 (0.170, 0.186)	<0.001
Separate inpatient psychiatric unit of general hospitals	2.78	3.69 (0.9118)	4.90 (1.2111)	6.51 (1.6088)	0.207 (0.199, 0.214)	<0.001
Adult residential treatment centers	0.43	0.45 (0.0143)	0.46 (0.0148)	0.48 (0.0153)	-0.045 (-0.058, -0.032)	<0.001
Mixed adult/children residential treatment centers	0.33	0.29 (-0.0387)	0.26 (-0.0342)	0.23 (-0.0302)	-0.201 (-0.222, -0.181)	<0.001
Veterans Administration Medical Centers	7.32	8.37 (1.0449)	9.56 (1.1941)	10.92 (1.3645)	0.056 (0.022, 0.090)	<0.001
Community Mental Health Centers	0.17	0.19 (0.0191)	0.21 (0.0213)	0.24 (0.0236)	0.028 (0.021, 0.034)	<0.001
Partial hospitalization and day treatment	0.21	0.22 (0.0117)	0.23 (0.0123)	0.25 (0.0130)	-0.023 (-0.035, -0.011)	<0.001
Outpatient mental health facilities	0.18	0.19 (0.0102)	0.20 (0.0108)	0.21 (0.0114)	-0.021 (-0.028, -0.014)	<0.001
Multi-setting mental health facilities	0.29	0.30 (0.0042)	0.30 (0.0043)	0.31 (0.0044)	-0.063 (-0.079, -0.047)	<0.001
Baseline*	0.38	0.41 (0.0309)	0.45 (0.0334)	0.48 (0.0361)		<0.001

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Table 11 *(continued)*

Type of NASS	Estimated Odds (change from previous year)				Coefficient (99% CI)	*p*-value
	2014	**2015**	**2016**	**2017**		
Non-nicotine tobacco cessation medication						
Psychiatric hospitals	0.96	1.01 (0.0569)	1.07 (0.0602)	1.14 (0.0638)	0.044 (0.031, 0.058)	<0.001
Separate inpatient psychiatric unit of general hospitals	1.37	1.45 (0.0737)	1.53 (0.0777)	1.61 (0.0818)	0.039 (0.028, 0.050)	<0.001
Adult residential treatment centers	0.46	0.39 (–0.0672)	0.33 (–0.0573)	0.29 (–0.0489)	-0.172 (-0.197, -0.146)	<0.001
Mixed adult/children residential treatment centers	0.42	0.29 (–0.1374)	0.19 (–0.0928)	0.13 (–0.0626)	-0.406 (-0.452, -0.360)	<0.001
Veterans Administration Medical Centers	9.84	10.58 (0.7352)	11.37 (0.7902)	12.22 (0.8492)	0.059 (-0.005, 0.123)	0.018
Community Mental Health Centers	0.23	0.23 (0.0035)	0.24 (0.0036)	0.24 (0.0036)	0.002 (-0.010, 0.013)	0.687
Partial hospitalization and day treatment	0.29	0.29 (–0.0032)	0.28 (–0.0031)	0.28 (–0.0031)	-0.024 (-0.045, -0.004)	0.002
Outpatient mental health facilities	0.17	0.19 (0.0199)	0.22 (0.0222)	0.24 (0.0248)	0.096 (0.083, 0.108)	<0.001
Multi-setting mental health facilities	0.25	0.28 (0.0333)	0.32 (0.0377)	0.36 (0.0428)	0.113 (0.085, 0.141)	<0.001
*Baseline**	0.38	0.39 (0.0052)	0.40 (0.0052)	0.40 (0.0053)		<0.001
Campus-wide tobacco ban						
Psychiatric hospitals	1.32	1.35 (0.0320)	1.39 (0.0328)	1.42 (0.0336)	-0.035 (-0.040, -0.031)	<0.001
Separate inpatient psychiatric unit of general hospitals	6.75	7.77 (1.0199)	8.94 (1.1741)	10.29 (1.3515)	0.081 (0.077, 0.086)	<0.001
Adult residential treatment centers	0.23	0.24 (0.0101)	0.25 (0.0106)	0.26 (0.0110)	-0.017 (-0.026, -0.007)	<0.001
Mixed adult/children residential treatment centers	0.83	1.29 (0.4628)	2.01 (0.7208)	3.14 (1.1225)	0.384 (0.372, 0.395)	<0.001
Veterans Administration Medical Centers	0.17	0.17 (0.0033)	0.17 (0.0033)	0.18 (0.0034)	-0.040 (-0.058, -0.022)	<0.001
Community Mental Health Centers	0.60	0.65 (0.0477)	0.70 (0.0515)	0.75 (0.0556)	0.017 (0.014, 0.021)	<0.001
Partial hospitalization and day treatment	0.63	0.51 (–0.1168)	0.41 (–0.0950)	0.34 (–0.0773)	-0.266 (-0.272, -0.259)	<0.001
Outpatient mental health facilities	0.61	0.66 (0.0513)	0.71 (0.0556)	0.77 (0.0603)	0.022 (0.018, 0.025)	<0.001
Multi-setting mental health facilities	0.62	0.62 (–0.0023)	0.61 (–0.0023)	0.61 (–0.0023)	-0.063 (-0.071, -0.055)	<0.001
*Baseline**	0.70	0.75 (0.0430)	0.79 (0.0456)	0.84 (0.0484)		<0.001

Non-nicotine Tobacco Cessation Medication

Psychiatric facilities, SIPUGH, and VAMCs were the only facilities to demonstrate positive odds for offering NTCM each year. Ranging from 9.8 to 12.2 times more likely, VAMCs had the greatest odds for offering NTCM each year (Table 11). With the exception of adult RTCs, mixed RTCs and PHPs, all facilities had positive changes each year for offering NTCM. However, with changes in odds ranging from 0.35% to 2.48%, CMHCs and OPs did not likely have noticeable annual changes in odds (Table 11). Adult RTCs did demonstrate decreased odds each year, and these changes in odds did become more positive at rates between 3% to 5% a year (Table 11). On average, NTCM access did not likely have noticeable changes each year (Table 11).

Campus-wide Tobacco Ban

All facilities, except for PHPs and MSMHs had increased odds each year for campus-wide tobacco bans. Adult RTCs and VAMCs did not likely have noticeable annual changes (Table 11). At 82% to 83% less likely, VAMCs were the least likely to have campus-wide tobacco bans and SIPUGH were the mostly likely at 6.8 to 10.3 times greater odds to have campus-wide bans each year compared to the reference group (Table 11). Mixed RTCs were also among the most likely to offer campus-wide tobacco bans, especially when comparing to adult RTCs. This is likely the effect of these facilities also treating children who are not of the legal age to use tobacco and a result of state law as opposed to tobacco culture. On average campus-wide tobacco bans had a pattern of being between 4.3% and 4.8% more likely each year to be offered (Table 11).

Number of NASS Offered

Table 12 illustrates the odds for offering multiple NASS for each facility type from 2014 to 2017. With the exception of both RTCs and PHPs, all facilities had decreasing odds for not offering any of the three services. These changes in odds ranged from 1.1% to 40.2% decrease each year. SIPUGH and psychiatry facilities did not appear to have noticeable changes each year. This may suggest that few facilities who previously had offered no NASS, continued to do so. On average, all facilities were between 4.72% and 5.61% more likely to offer one or more NASS each year and this appeared to be more heavily skewed toward offering all three services with rate increases between 8.6% and 10.6% each year (Table 12). Psychiatric facilities and SIPUGH were most likely to offer all three services with odds between 1.54 to 2.26 and 1.92 to 3.46 times more likely from 2014 to 2017 respectively (Table 12).

Table 12 Estimated odds for offering a number of NASS offered by type of facility for facilities that have campus-wide tobacco bans. *indicates reference group, **VAMC ommitted due to small sample size

Number of NASS	Estimated odds (change from previous year)				Coefficient (99% CI)	p-value
	2014	2015	2016	2017		
Offering no NASS						
Psychiatric hospitals	0.23	0.20 (-0.0344)	0.17 (-0.0293)	0.14 (-0.0250)	-0.073 (-0.088, -0.059)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.15	0.12 (-0.0310)	0.09 (-0.0245)	0.07 (-0.0193)	-0.149 (-0.162, -0.137)	<0.001
Adult residential treatment centers	0.30	0.37 (0.0650)	0.44 (0.0790)	0.54 (0.0960)	0.282 (0.262, 0.302)	<0.001
Mixed adult/children residential treatment centers	0.73	0.96 (0.2312)	1.26 (0.3049)	1.66 (0.4020)	0.363 (0.334, 0.392)	<0.001
Community Mental Health Centers	0.92	0.81 (-0.1178)	0.70 (-0.1027)	0.61 (-0.0896)	-0.050 (-0.059, -0.041)	<0.001
Partial hospitalization and day treatment	1.17	1.06 (-0.1078)	0.96 (-0.0978)	0.87 (-0.0888)	-0.011 (-0.026, 0.005)	0.081
Outpatient mental health facilities	1.20	1.12 (-0.0810)	1.05 (-0.0755)	0.98 (-0.0704)	0.017 (0.007, 0.026)	<0.001
Multi-setting mental health facilities	1.01	0.90 (-0.1122)	0.80 (-0.0998)	0.71 (-0.0887)	-0.031 (-0.052, -0.010)	<0.001
Baseline*	0.68	0.62 (-0.0561)	0.57 (-0.0515)	0.52 (-0.0472)		<0.001
Offering only one NASS						
Psychiatric hospitals	0.22	0.19 (-0.0298)	0.16 (-0.0257)	0.14 (-0.0221)	-0.183 (-0.194, -0.172)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.19	0.15 (-0.0392)	0.12 (-0.0311)	0.09 (-0.0246)	-0.267 (-0.277, -0.257)	<0.001
Adult residential treatment centers	0.24	0.27 (0.0349)	0.31 (0.0400)	0.36 (0.0460)	0.104 (0.087, 0.121)	<0.001
Mixed adult/children residential treatment centers	0.19	0.17 (-0.0171)	0.16 (-0.0155)	0.14 (-0.0142)	-0.128 (-0.158, -0.098)	<0.001
Community Mental Health Centers	0.27	0.30 (0.0335)	0.34 (0.0377)	0.38 (0.0424)	0.083 (0.076, 0.091)	<0.001
Partial hospitalization and day treatment	0.28	0.33 (0.0495)	0.39 (0.0583)	0.45 (0.0686)	0.130 (0.117, 0.142)	<0.001
Outpatient mental health facilities	0.33	0.33 (0.0019)	0.33 (0.0019)	0.33 (0.0019)	-0.028 (-0.037, -0.020)	<0.001
Multi-setting mental health facilities	0.19	0.24 (0.0478)	0.30 (0.0598)	0.37 (0.0748)	0.190 (0.171, 0.209)	<0.001
Baseline*	0.25	0.26 (0.0086)	0.27 (0.0089)	0.28 (0.0092)		<0.001

Table 12 *(continued)*

Number of NASS	Estimated odds (change from previous year)				Coefficient (99% CI)	p-value
	2014	2015	2016	2017		
Offering any two NASS						
Psychiatric hospitals	0.35	0.37 (0.0140)	0.38 (0.0146)	0.40 (0.0152)	0.093 (0.080, 0.106)	<0.001
Separate inpatient psychiatric unit of general hospitals	0.42	0.40 (−0.0134)	0.39 (−0.0130)	0.38 (−0.0126)	0.021 (0.010, 0.033)	<0.001
Adult residential treatment centers	0.37	0.32 (−0.0503)	0.28 (−0.0435)	0.24 (−0.0376)	−0.091 (−0.115, −0.066)	<0.001
Mixed adult/children residential treatment centers	0.26	0.16 (−0.0913)	0.11 (−0.0587)	0.07 (−0.0378)	−0.387 (−0.438, −0.335)	<0.001
Community Mental Health Centers	0.18	0.15 (−0.0289)	0.13 (−0.0242)	0.10 (−0.0203)	−0.123 (−0.135, −0.110)	<0.001
Partial hospitalization and day treatment	0.11	0.12 (0.0076)	0.13 (0.0081)	0.14 (0.0087)	0.119 (0.096, 0.141)	<0.001
Outpatient mental health facilities	0.10	0.11 (0.0056)	0.11 (0.0059)	0.12 (0.0062)	0.108 (0.094, 0.122)	<0.001
Multi-setting mental health facilities	0.15	0.14 (−0.0114)	0.12 (−0.0105)	0.12 (−0.0097)	−0.027 (−0.063, 0.009)	0.057
Baseline*	0.21	0.20 (−0.0109)	0.19 (−0.0103)	0.18 (−0.0098)		<0.001
Offering all three NASS						
Psychiatric hospitals	1.54	1.75 (0.2104)	1.99 (0.2392)	2.26 (0.2719)	0.022 (0.012, 0.032)	<0.001
Separate inpatient psychiatric unit of general hospitals	1.92	2.34 (0.4158)	2.84 (0.5058)	3.46 (0.6154)	0.090 (0.082, 0.098)	<0.001
Adult residential treatment centers	0.92	0.79 (−0.1357)	0.67 (−0.1157)	0.57 (−0.0987)	−0.265 (−0.286, −0.245)	<0.001
Mixed adult/children residential treatment centers	0.72	0.67 (−0.0488)	0.63 (−0.0455)	0.59 (−0.0424)	−0.176 (−0.205, −0.148)	<0.001
Community Mental Health Centers	0.49	0.59 (0.0990)	0.71 (0.1187)	0.86 (0.1425)	0.076 (0.068, 0.084)	<0.001
Partial hospitalization and day treatment	0.43	0.36 (−0.0703)	0.30 (−0.0588)	0.25 (−0.0492)	−0.285 (−0.305, −0.264)	<0.001
Outpatient mental health facilities	0.33	0.37 (0.0402)	0.41 (0.0451)	0.46 (0.0506)	0.009 (0.000, 0.019)	0.013
Multi-setting mental health facilities	0.63	0.65 (0.0242)	0.68 (0.0252)	0.70 (0.0261)	−0.068 (−0.088, −0.049)	<0.001
Baseline*	0.77	0.85 (0.0860)	0.95 (0.0957)	1.06 (0.1064)		<0.001

Discussion

Despite the emotional and physiological consequences of tobacco use, substance use dependency treatment (SUDt) has an established culture that often gives nicotine addiction a free pass compared to other forms of chemical dependency. Research on organizational culture often relies on self-reported data and, in the context of tobacco use in SUDt, is frequently limited by small sample sizes and difficult to define outcomes. This study demonstrates that organizational culture can be measured by proxy using data on organization policy instead of self-reported surveys on perceptions of culture. More specifically, this study used access to nicotine addiction support services (NASS) as a proxy indicator for organization tobacco culture. In order to validate access to NASS as a proxy indicator, three assumptions had to be met: 1) a culture of pro-tobacco use does exist within SUDt, 2) facilities that do not ban tobacco use will be less likely to offer services, and 3) the likelihood of facilities having a campus-wide tobacco ban will increase with the number of NASS offered at those facilities.

Because the first assumption can only be supported by outside literature, which has been provided previously in this paper, this study focuses on the latter two assumptions. Results indicate that the odds of offering each individual NASS nearly double for facilities that have campus-wide tobacco bans compared to those that do not. Additionally, results indicate that the likelihood of a facility offering a campus-wide tobacco ban increases with the number of NASS offered at that facility. This supports the utility of using access to NASS as a proxy indicator and may suggest facilities that do not have policies prohibiting tobacco use on campus may more likely to be

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influenced by organizational tobacco culture. This may also suggest that of those with campus-wide bans, the influence of tobacco culture may be greatest among those facilities that offer the least number of NASS.

Veteran Administration Medical Centers (VAMC) had the greatest odds and greatest proportion of facilities offering tobacco cessation counseling (TCC), tobacco cessation medication (NTCM) and nicotine replacement therapy (NRT), but were least likely to offer campus-wide tobacco bans. This provides an excellent example of the potential influence of tobacco culture on policy. VAMC are a fully integrated closed health system designed to offer extensive physical and behavioral healthcare services to their patients. As noted in a previous study that accessed the rates of integrated care services at SUDt facilities (Hercules et al., 2019b), with rates of integrated care services far exceeding other types of facilities, such a clear separation in access to NASS and campus-wide tobacco ban policies suggests that VAMC policy towards tobacco use may be heavily influenced by tobacco culture.

Psychiatric facilities and separate inpatient psychiatric units of general hospitals (SIPUGH) consisted of the greatest annual increases in odds for offering each type of NASS and were the two most likely to have campus-wide tobacco bans, suggesting that these treatment environments may be conducive to positive changes in tobacco culture. As these facilities tend to be associated with larger organizations, a possible explanation for this could be greater access to resources and training of staff. Training staff in nicotine addiction treatment services requires investment of time and money, and lack of staff training may be a mediating variable for available services at these facilities

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(Knudsen, Studts, et al., 2010). Deficits in training and knowledge are commonly associated as barriers to promoting tobacco cessation (Delucchi et al., 2009). Settings in which tobacco use is lower and training for tobacco cessation is higher, particularly in terms of efficacy, are more likely to promote tobacco cessation (Eby et al., 2014; Fuller et al., 2007; Knudsen, Muilenburg, & Eby, 2013; Knudsen & Studts, 2010; Koch & Breland, 2015; Lubetkin et al., 2010; Ziedonis et al., 2007). However, due to substantial insufficiencies and nation-wide inconsistency for educating and training SUDt counselors in tobacco cessation therapies (Kerwin, Walker-Smith, & Kirby, 2006), and the reciprocal interaction of training with other cultural norms, any mediating or moderating effect training may have on access to nicotine addiction support services can be argued to be a cultural impact.

NRT and NTCM were the least likely to be offered to offered among all facilities, even among facilities that had greatest access to all three services or campus-wide tobacco bans. As mentioned above, facilities that ban tobacco use and do not offer other NASS may not have the appropriate resources or training for providing each type of NASS. Similarly, some of these facilities may also treat nicotine addiction on par with other addictions, and thus may not feel separate services are needed. However, because NRT and NTCM are often billed directly to the patient, providing access to these services should not be costly, and because this study measured access and not utilization, organization motivation (or culture) may be a better explanation for a lack of access. Further, these services have been shown to be effective with many patients and not offering them is a disservice to the patient (Eby et al., 2014, Chen et al., 2015), and

including free access to these aids may help both patients and employees overcome a

life-long struggle with tobacco addiction (Quinn et al., 2005; Ranney et al., 2006;

Tillgren et al., 1998). It should be noted, however, that when providing pharmacotherapy

it is necessary to ensure staff, including physicians, feel confident in both their

discussing and delivering pharmacotherapies with patients (Bride, Abraham, & Roman,

2010; Schnoll et al., 2006; Studts et al., 2010), and that lack of knowledge for the

therapies represent a significant barrier (Eby, Laschober, & Muilenburg, 2015; Knudsen

et al., 2005; McMenamin, Halpin, & Bellows, 2006).

Overall, there appears to a pattern for increasing access to TCC and campus-wide

tobacco bans, but these appear to be independent from one another and does not suggest

any meaningful change in tobacco culture since 2014 with the possible exception of

psychiatric facilities and SIPUGH. However, increased rates in campus-wide tobacco

bans for psychiatric facilities may not be noticeable. This supports the evidence in the

literature that tobacco culture may play a significant role in preventing patients from

benefiting in evidence-based practices of substance use dependency treatment.

Tobacco use in SUDt is disproportionately higher compared to the general

population and represents a tobacco culture common in SUDt organizations. Myths of

the psychologically harmful effects on sobriety resulting from smoking cessation, in

addition to organization policies that normalize tobacco use, have reinforced this tobacco

culture—a culture that contradicts evidence-based recommendations for obtaining and

maintaining sobriety for those seeking SUDt. The characteristics associated with this

culture are essentially self-reinforcing as staff reinforces organization tobacco policy,

and organization policy reinforces staff culture. When combined with a history of anti-tobacco cessation in the recovery community and a patient population comprised of a majority of tobacco users, this tobacco culture represents a significant barrier for organizations that wish to create an environment for patients that is conducive to evidence-based practices.

<p style="text-align:center;">*Culture Change Strategies*</p>

Notwithstanding this cultural hurdle, organizations can promote culture change by considering evidence-based recommendations such as removing organization-level obstacles, providing open and thorough two-way communication with staff, standardizing tobacco addiction therapy as part of SUDt, denormalizing tobacco use within the organization, and both focusing on and providing the necessary resources for staff to promote an effective transition to a tobacco-free culture. The recommendations are detailed below.

Remove Organization-level Obstacles

As previously discussed, there are a variety of obstacles to a pro-tobacco cessation culture. However, because the authority to make changes to organizational policy lies in the hands of administrators, organization-level obstacles should be removed and new policies that support culture change should be institutionalized first (Eby et al., 2015). Examples of such changes include: changes in hiring procedures such that new hires support tobacco cessation practices and/or tobacco free lifestyles (S. Fernandez & Rainey, 2006; W. Miller et al., 2006; Pbert, Jolicoeur, Reed, & Gammon, 2007), hiring additional employees to alleviate concerns of additional time requirements

of staff associated with the fear of increased work/role load resulting from policy changes (Eby et al., 2014), formally celebrating employee accomplishments in tobacco cessation therapy or achievements in personnel tobacco reduction benchmarks (S. Fernandez & Rainey, 2006), pilot test and run trails for new innovations (Judson, 1991), and establish training and certification programs for continued employment (Ziedonis et al., 2007). Additionally, establishing formal standard of practices (Pbert et al., 2007) and expectations for supervisors to lead by example (Rothrauff-Laschober, de Tormes Eby, & Sauer, 2013) are critical steps in implementing organization change. Further, Holtrop et al. suggest that providing one central referral source, assigning a referral coordinator, and having reimbursement for tobacco therapy as a billable code will help eliminate the financial barrier of reimbursement issues for tobacco cessation therapies (Eby et al., 2014; Holtrop et al., 2008).

In order to strengthen adherence to policies, including system level prompts like checklists and instructional guides to counselors, admissions staff, and physicians may be beneficial (Braun et al., 2004). Additionally, standardized assessments and evaluations for measuring adherence to policies should be created and implemented for both patients and staff (Henggeler et al., 2002; Pbert et al., 2007). Finally, it is particularly important to ensure that all policy changes are implemented system-wide, as policy changes that only affect select sub-systems will not create a strong enough impact for organization-wide changes (S. Fernandez & Rainey, 2006). However, understanding how multiple subsystems will interact with one another, prior to implementing any

subsystem change, is essential in order to prevent any unintended deleterious

consequences (Braun et al., 2004; S. Fernandez & Rainey, 2006).

Communicate Changes with Staff

As in any organization, adequate communication of policy changes prior to

implementation is essential for successful change. Coworkers may influence others

through modeling, perceptions, beliefs, and attitudes, which may result changes in work

attitudes, role effectiveness, and role perceptions (Laschober, Muilenburg, & Eby,

2014). Including staff in the decision-making process, giving them ample time to adjust

and plan, and acting supportively to individuals needs associated with the change will

help mitigate rumors, foster perceptions of fairness, and positively transition employees

to new policy changes (de Tormes et al., 2013; Eby et al., 2013; Terry & Callan, 1997).

Additionally, finding an employee that can act as a policy advocate can help facilitate

reception for change (Martino, 2010) by acting as a mentor, managing interpersonal

relationships among staff, and providing consistent onsite positive reinforcement for the

change (W. Miller et al., 2006). Data show that employees who perceive themselves as

well-informed on the change-related policies report higher levels of psychological well-

being, client engagement, and job satisfaction (Jimmieson, Terry, & Callan, 2004).

Further, employees who have a sense of prediction and understanding of these future

changes are more likely to appraise the changes as positive (Jimmieson et al., 2004).

Frequent staff meetings, email updates, Q&As, and open-door policies with advocates

and administrators may be a way to help enhance communication with employees

(Detert & Burris, 2007; Giesecke & McNeil, 2004; L. Lewis, 1999).

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Inclusion of Tobacco Addiction into Standard SUDt

Tobacco use is not a benign behavior, either physiologically and psychologically, and is closely tied to urges to drink and consume other drugs, as well as frequently adopted for use as a substitute drug and coping mechanism while in treatment and may ultimately result as a threat to sobriety (Asher et al., 2003; Monti et al., 1995). Ignoring tobacco addiction while in SUDt is neglecting to address a significant mental health concern of which is the very reason for why individuals seek SUDt. Including tobacco counseling as a therapeutic standard in SUDt is essential for psychological wellness.

Denormalize Tobacco Use

Denormalization strategies have been used successfully in public health to influence social norms in order to enhance intentions to quit, promote tobacco cessation, and encourage abstinence from tobacco products (Baha & Le Faou, 2010; A. Brown, Moodie, & Hastings, 2009; Calabro, Costello, & Prokhorov, 2010; Chapman & Freeman, 2008; Hammond et al., 2006). Similarly, these strategies can be used within SUDt organizations to promote devaluation in tobacco use. One such strategy is limiting where tobacco can be used (Bell, Salmon, Bowers, Bell, & McCullough, 2010). A complete indoor/outdoor tobacco ban at SUDt facilities will help remove visual social reminders of the acceptability of tobacco use (Calabro et al., 2010). Another strategy is to provide marketing material for tobacco replacement therapies or pharmacotherapy where patients and staff will be consistently exposed to the messages (Calabro et al., 2010; Eby et al., 2015; McMenamin et al., 2003). Contingency management programs have also been used to help encourage both staff and patients to promote tobacco

cessation. These programs include motivational incentives and voucher-based reinforcement therapy such as cash inducements, team competition, or lottery systems for tobacco cessation (Bride et al., 2010; de Tormes Eby et al., 2012; Martino, 2010). However, denormalization strategies are susceptible to negative stigmatization of a target behavior, and may prove to be counterproductive (Bell et al., 2010). Such strategies should consider positive reinforcement for cessation behaviors and not emotionally isolate individuals who fail to succeed.

Focus on Educating Staff

Although administrators are the ones ultimately making the decisions, the counselors, physicians, nurses, and other support staff are on the front line enacting those decisions. Realigning the perceptions and attitudes of staff towards organizational policy is key to a successful organizational culture change (Fuller et al., 2007; Knudsen et al., 2005). Attributing staff resistance solely on staff choice, however, takes focus away from the antecedents associated with that behavior (Dent & Goldberg, 1999; Piderit, 2000). SUDt facility staffing has frequently been characterized with high turnover (McLellan, Carise, & Kleber, 2003), high rates of staff in recovery (between 37% to 57%) (Curtis & Eby, 2010; Knudsen, Ducharme, & Roman, 2006; McNulty et al., 2007), low salaried, high work and role loads, little standardized training and education, and high rates of tobacco use (Christiansen et al., 2016; Delucchi et al., 2009; Eby et al., 2014; Fuller et al., 2007; Tajima et al., 2009; Ziedonis et al., 2007). This makes an expectation for staff culture to immediately conform to policy change unrealistic. Staff should be educated on tobacco addiction as it relates to drug and

alcohol addiction (Nagle, Schofield, & Redman, 1996; HHS, 2007). Staff members also

need to have confidence in their ability to translate their new understanding of tobacco

addiction in both personal, and professional, daily practice (de Tormes & Laschober,

2014; Jimmieson et al., 2004; Quinn et al., 2005). Organizations must offer opportunities

to educate, train, and practice these new policies before implementation (Eby, 2014;

Knudsen et al., 2005; Martino, 2010; W. Miller et al., 2006; Pbert et al., 2007;

Satterlund, 2009). Clinical staff must also play an active role in promoting policies, as

their influence heavily impacts patient attitudes (E. Frank, Elon, & Spencer, 2009;

Meredith et al., 2005), and counselors need to understand healthcare benefits (i.e.

Medicaid, private insurance, etc.) and how to use them (McMenamin et al., 2006).

Given the substantial emotional, legal, social, and physical effects of drug and

alcohol addiction (DiFranza & Guerrera, 1990; Jellinek, 1960; Knight et al., 2002;

Leshner, 1997; Moskowitz, 1989; Ray, 1978), it is critical for those seeking treatment to

receive the best possible chance of achieving and maintaining sobriety. Because tobacco

use is so closely tied to drug and alcohol dependency, it is also essential that SUDt

organizations make the transition to treating tobacco addiction as standard practice and

work towards producing an organization culture that promotion tobacco independence.

Limitations

This study has seven key limitations.

1. In order to use access to NASS as a proxy measure for organization tobacco

   culture this study relies on previous literature studying the organizational culture

within SUDt facilities and assumes that these studies were conducted and reported to the standards that were described in their research.

2. A facility's ability to take advantage of economies of scale in providing integrative services could moderate results, and because information on the size of facilities is not provided, results should be interpreted with caution. For example, psychiatric facilities SIPUGH, and VAMCs may be larger in both size and resources compared to RTCs or PHPs, which may allow them to have a greater number of patients and/or resources that result in more affordable access to NASS.

3. This study does not measure the efficacy, processes, or any iatrogenic effects associated with these services. It should be noted that although the effect of these services may vary from patient to patient, the purpose of this study is to illustrate gaps in care in which access to services are needed in order improve healthcare rather than advocate for specific services.

4. Since this study does not measure utilization, it cannot account for facilities that offer these services but do not promote their use, or offers only a diluted version. Therefore, the relationship of tobacco culture with nicotine addiction support services could be understated.

5. Because these data consisted only of information for access to services at different types of SUDt facilities, data were not available on staff or facilities resources such as training, financing, geography, patient demographics, or patient population sizes.

6. Due to the lack of availability of measurements for variables of interest in other years, this study uses SAMHSA NMHSS data from only 2014, 2015, and 2016. Because of this limited time frame, variable differences between years may demonstrate smaller effects.

7. The NHMHSS dataset provides a unique opportunity to assess the prevalence of access to multiple NASS across the United States. However, due to SAMHSA policies for maintaining anonymity among facilities, provider facilities were deidentified each year. This has prevented this study from following specific provider facilities longitudinally. However, it does not prevent the comparison of means and proportions aggregated by year and facility category, and does not compromise study findings. The N-MHSS only accounts for facilities whose SUDt services are of mixed, or secondary focus. Facilities whose primary treatment focus is SUDt were excluded in this survey. This represents a significant loss in response and decreases the ability for generalizing to all SUDt facilities.

Conclusion

Less than half of all substance use dependency treatment facilities completely prohibit tobacco use within their campuses, and of those that did, over half offered one or fewer nicotine addiction support services with likely few noticeable positive changes over time. By using access to nicotine addiction support services at substance use dependency treatment facilities as a proxy indicator for organization culture, this study attributes these patterns to organizational culture that purposefully does not value the

nicotine addiction on par with other chemical dependencies and proposes several

recommendations to help assist in positive organizational culture change.

CHAPTER V

CONCLUSIONS

Data suggest that individuals with comorbid behavioral health conditions represent nearly 85% of healthcare spending for their physical health conditions alone (Thorpe et al., 2017). As a way to improve health outcomes and decrease the financial burden of those with comorbid physical and behavioral health condition, chapter two takes a look at the variety of integrated healthcare models by systematically gathering and reporting evidence for the efficacy, setting of application, and healthcare deliverer of these integrated models from the most current systematic reviews.

The umbrella review demonstrated that there was substantial variation between and within models regarding treatment type, length, frequency, exposure time, delivery and setting, technology employed, type and number of healthcare providers, targeted health outcome, and interactions between intervention components. Overall, collaborative care (CC) appeared to have the greatest efficacy in improving health outcomes, although evidence was mostly limited to depression and depression-related symptoms. However, complex interventions like CC are more difficult to integrate and coordinate in health systems, but do provide several advantages in terms of longer-term and multidisciplinary team-base support. Brief interventions (BI) and behavioral interventions require less resources and typically provide a more flexible opportunity for healthcare providers to briefly connect with their patients on site and at the time of an appointment when compared to complex interventions. Unfortunately, deliverer/provider

training seemed to be the greatest hurdle for success across all models. There appeared to be no significant difference between the efficacy of behavioral interventions and BI, suggesting that BI may have a greater return on investment as compared to behavioral interventions because it allows for a less complex opportunity for healthcare professionals to provide some integrated care in settings where extended patient exposure and resources required for CC and behavioral interventions may not be available.

As previously mentioned, major barriers to providing behavioral health care to patients include inadequate behavioral screening, identifying, and referring those with behavioral healthcare needs to behavioral health treatment (Agley et al., 2014; McLellan & Woodworth, 2014; Minkoff & Gordon, 2016; Saitz et al., 2013), a lack of physician/provider time, training, and motivation for behavioral healthcare practices (V. Lewis et al., 2014; Rieckmann et al., 2017), and physical access to behavioral health services (Abraham et al., 2017; Buche et al., 2017; Cucciare & Timko, 2015). Although these barriers are very real limitations across all healthcare settings, they are considerably less obstructive in substance use dependency treatment (SUDt) facilities because these facilities are specifically equipped with the resources to overcome these barriers. As such, this makes SUDt facilities an ideal location to provide integrated healthcare to a population that is in desperate need. Chapter three examined current rates of access to three types integrated physical healthcare services offered at SUDt treatment facilities from 2014-2017 in order to highlight gaps in care in which access to services are needed in order improve healthcare.

There was significant variability between type and number of integrated care services offered at each type of SUDt facility. Partial hospitalization, day treatment, and outpatient mental health facilities, Community Mental Health Centers, and outpatient mental health facilities were consistently among the least likely to offer integrated care services. Overall, there were higher rates of facilities not offering any service compared to offering one or more services across all survey years with nearly half not offering any integrated care service at all and no noticeable changes over time. With the exception of Veterans Administration Medical Centers, which consistently had highest rates of for offering all services, this study demonstrated a clear underservice to patients and substantial opportunity for improving patient health outcomes via improving access to these services.

Improving access to integrate services is not the only opportunity available for SUDt facilities with regard to improving the health and treatment outcomes of their patients. Despite tobacco use as known as the greatest cause of preventable disease in the world (Samet, 2013) and evidence indicating its use increases dependency on drug/alcohol addiction (Eby, Laschober, & Muilenburg, 2014; McClure et al., 2015; Myers et al., 2007; Sharp et al., 2003; Toussaint et al., 2009; Weinberger et al., 2015), tobacco use among patients still range from 77% to 95% and 30% to 40% among staff (Christiansen et al., 2016; Delucchi et al., 2009; Fuller et al., 2007; Tajima et al., 2009; Ziedonis et al., 2007). Chapter four highlighted the opportunity to enhance patient treatment and health outcomes by assessing the existence of tobacco culture within SUDt facilities and provided strategies to help facilitate culture change within these

facilities. More specifically, this study used access to nicotine addiction support services (NASS) as a proxy indicator for organization tobacco culture by confirming three qualifications: 1) a pro-tobacco use culture does exist within SUDt, 2) facilities that do not ban tobacco use will be less likely to offer NASS, and 3) the likelihood of facilities having a campus-wide tobacco ban will increase with the number of NASS offered at those facilities.

Finally, after identifying tobacco culture as an opportunity for change, chapter four presented evidence-based recommendations such as removing organization-level obstacles, providing open and thorough two-way communication with staff, standardizing tobacco addiction therapy as part of SUDt, denormalizing tobacco use within the organization, and both focusing on and providing the necessary resources for staff to promote an effective transition to a tobacco-free culture.

In a poetic conclusion, this dissertation takes the timeless aphorism from Alcoholics Anonymous to heart by admitting first that we have a problem before change can occur. In this case, the prevalence and efficacy of integrated healthcare practices and tobacco culture within SUDt has been demonstrated, followed by the highlighting of opportunities and strategies for organizations to help improve the health and treatment outcomes for patients with behavioral health and substance use dependency disorders.

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APPENDIX A

Table A-1 Quality of Selected Reviews

Author/year	Q1: Is the review question clearly and explicitly stated?	Q2: Were the inclusion criteria appropriate for the review question?	Q3: Was the search strategy appropriate?	Q4: Were the criteria for appraising studies appropriate?	Q5: Was critical appraisal conduction by two or more reviewers independently?	Q6: Were the methods used to combine studies appropriate?	Q7: Was the likelihood of publication bias assessed?	Q8: Was the likelihood of publication bias acknowledged?	Q9: Were recommendations for policy and/or practice supported by the reported data?	Q10: Were specific derectives for new research appropriate?	Quality Score
Alarez-Bueno et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Unclear	Yes	Moderate
Archer et al., 2012	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Baker & Fatoye, 2017	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Barnes & Ivezaj, 2015	Yes	Yes	Unclear	Yes	Unclear	Yes	No	Yes	Yes	Yes	Moderate
Barrett & Chang, 2016	Yes	Yes	Yes	Yes	Yes	Yes	No	No	N/A	N/A	Moderate
Bernardy et al., 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Booth et al., 2014	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Good
Bower et al., 2011	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Bray et al., 2011	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Cape et al., 2010a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Cape et al., 2010b	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Good
Choo et al., 2012	Yes	Unlcear	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Conejo-Ceron, 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Coventry et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Cramer et al., 2012	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Cuijpers et al., 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Devi et al., 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Elzerbi et al., 2017	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Moderate
Fernandez et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Gillies et al., 2016	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Grochtdreis, 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
H Huang et al., 2017	Yes	Unclear	Yes	No	No	Yes	No	No	Yes	Yes	Low
Huang et al., 2013	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	N/A	Good
Hudson et al., 2015	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Good
Jackson et al., 2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Jacob et al., 2012	Yes	Yes	Yes	Yes	Unclear	Yes	No	No	Yes	Yes	Moderate
Jonas et al., 2012	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Unclear	Yes	Good
Kaner et al., 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Keurhorst et al., 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Kohler & Homann, 2015	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Good
Levine et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Linde et al., 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Martin Cantera et al., 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
McGinnies et al., 2016	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Morton et al., 2014	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Good
Nair et al., 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Panagioti et al., 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Pelletier et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good

Table A-1 *(continued)*

Author/year	Q1: Is the review question clearly and explicitly stated?	Q2: Were the inclusion criteria appropriate for the review question?	Q3: Was the search strategy appropriate?	Q4: Were the criteria for appraising studies appropriate?	Q5: Was critical appraisal conduction by two or more reviewers independently?	Q6: Were the methods used to combine studies appropriate?	Q7: Was the likelihood of publication bias assessed?	Q8: Was the likelihood of publication bias acknowledged?	Q9: Were recommendations for policy and/or practice supported by the reported data?	Q10: Were specific derectives for new research appropriate?	Quality Score
Schmidt et al., 2015	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Good
Sighinolfi et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Good
Smith et al., 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Thota et al., 2012	Yes	Yes	Yes	Uclear	Yes	Yes	Yes	Yes	Yes	Yes	Good
Tully & Baumeister, 2015	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	N/A	Good
van der Feltz-Cornellis et al. 2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
van Steengen-Wijengurg et al., 2010	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
VanBuskirk & Wetherell,	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Good
Watson et al., 2013	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Good
Woltmann et al., 2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent
Wray et al., 2017	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Good
Zhang et al., 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Excellent

Reasons for listing as unclear: Q2—included observational studies, Q3—searched only one database, Q4—appraisal guidelines not listed, Q5—no indication if reviewers were independent or the specific number of reviewers.

Table A-2

Components that Characterize Collaborative Care *(Gunn et al., 2006)*	
A multi-professional approach to patient care	This required that a general practitioner (GP) or family physician and at least one other health professional (e.g. nurse, psychologist, psychiatrist, pharmacist) were involved with patient care.
A structured management plan	In line with introducing an organised approach to patient care 'systems' trials were required to offer practitioners access to evidence based management information. This could be in the form of guidelines or protocols. Interventions could include both pharmacological (e.g. antidepressant medication) and non-pharmacological interventions (e.g. patient screening, patient and provider education, counselling, cognitive behaviour therapy).
Scheduled patient follow-ups	A 'systems' approach required interventions to have an organised approach to patient follow-up. Defined as one or more scheduled telephone or in-person follow-up appointments to provide specific interventions, facilitate treatment adherence, or monitor symptoms or adverse effects.
Enhanced inter-professional communication	This required that the intervention introduced mechanisms to facilitate communication between professionals caring for the depressed person. This included team meetings, case-conferences, individual consultation/supervision, shared medical records, patient-specific written or verbal feedback between care-givers and was sometimes referred to as 'collaborative care' in the publications.

Table A-3

Components that Characterize Collaborative Care *(van Steenbergen-Weijenburg et al., 2010)*
1) Within collaborative care the role of care manager is introduced to assist and manage the patient by providing structured and systematic interventions.
2) A network is formed around the patient with at least two of the three following professionals: general practitioner, care manager, and consultant psychiatrist.
3) Process and outcome of treatment is being monitored and in case of insufficient improvement treatment may be changed according to the principles of stepped care.
4) Evidence-based treatment is provided.

Table A-4

Collaborative Chronic Care Model (CCM) Core Elements *(Woltmann et al., 2012)*		
Element	Focus	Example
Patient self-management support	Coaching, problem solving, or skills-focused psychother- apy or psychoeducation targeting ability to self-manage symptoms and participate more effectively in clinical care and decision making.	Behavioral change strategies or coaching, illness-specific psychoeducation, shared decision-making interventions, cognitive-behavioral or problem-solving therapies.
Clinical information systems use	Facilitation of information flow from relevant clinical sources to treating clinicians for optimal management of individuals, panels, or populations.	Case registries, reminder systems, provision of timely clinical information (e.g., laboratory and study results) regarding individuals in treatment, and/or feedback to providers.
Delivery system redesign	Redefinition of work roles for physicians and support staff to facilitate anticipatory or preventive rather than reactive care; allocation of staff to implement other CCM elements, such as self-management support and information flow.	Licensed clinical staff or health educators to provide psychoeducation, ensure provision of appropriately timed clinical information for specific cases, or review of panel or population data for anticipatory and preventive management needs.
Provider decision support	Facilitated provision of expert-level input to generalist clinicians managing cases without need for specialty consultation separated in time and space from clinical needs.	On-site or facilitated expert consultation or provision of simplified clinical practice guidelines supported by local clinician champions.
Community resource linkage	Support for clinical and nonclinical needs from resources outside the health care organization proper.	Referral to peer support groups, exercise programs, housing resources, home care programs.
Health care organization support	Organization-level leadership and tangible resources to support CCM goals and practices.	Provision of adequate clinical staff for CCM training and implementation; support from key nonclinical services, such as informatics; championship by organization lead- ership, optimally with a commitment to sustainability after the research phase of the intervention ends.

Table A-5

Patient Centered Medical Home (PCMH) Definition, *(Jackson et al., 2013)*
1) Team-based care, defined as a team-based structure in which 2 or more clinicians work together to provide care. The team may be virtual.

2) The intervention includes ≥2 of the following 4 elements:
   i. Enhanced access to care (e.g., advanced electronic communications, such as Internet or telephone visits, open-access scheduling, group visits, 24/7 coverage).
   ii. Coordinated care (care coordinated across settings, such as inpatient and outpatient, or across specialty and nonspecialty care, such as mental health, or subspecialty medicine and primary care; care management; or referral tracking).
   iii. Comprehensiveness—that is, care that is accountable for addressing a large majority of personal health needs (e.g., preventive care, acute care, chronic disease care, and mental health).
   iv. A systems-based approach to improving quality and safety (e.g., care planning process, evidence-based medicine/clinical guidelines, point-of-care resources, electronic prescribing, test tracking, performance measurement, self-management support, accountability, and shared decision making).

3) A sustained partnership and personal relationship over time oriented toward the whole person (e.g., designating a primary point of contact who coordinates care, a personal physician, and shared decision making).
4) The intervention involves structural changes to the traditional practice, reorganizing care delivery (e.g., new personnel, new role definitions, functional linkages with community organizations and/or other health care entities, such as hospitals, specialists or other service providers, and disease registries).

Table A-6 Substance Abuse and Mental Health Services Administration (SAMHSA) Mental Health Services Survey (NMHSS) definitions for types of mental health treatment facilities.

Facility Type	Definition
Psychiatric hospitals	Facilities licensed and operated as state/public psychiatric hospitals, or as state-licensed private psychiatric hospitals that primarily provide 24-hour inpatient care to persons with mental illness. They may also provide 24-hour residential care and/or less than 24-hour care (i.e., outpatient, partial hospitalization), but these additional service settings are not requirements.
General hospitals with a separate inpatient psychiatric unit	Licensed general hospitals (public or private) that provide inpatient mental health services in separate psychiatric units. These units must have specifically allocated staff and space for the treatment of persons with mental illness. The units may be located in the hospital itself or in a separate building that is owned by the hospital.
Veterans Administration medical centers	Facilities operated by the U.S. Department of Veterans Affairs, including general hospitals with separate psychiatric inpatient units, residential treatment programs, and/or psychiatric outpatient clinics.
Partial hospitalization/day treatment mental health facilities	Provide only partial day mental health services to ambulatory clients, typically in sessions of three or more hours on a regular schedule. A psychiatrist generally assumes the medical responsibility for all clients and/or for the direction of their mental health treatment.
Outpatient mental health facilities	Provide only outpatient mental health services to ambulatory clients, typically for less than three hours at a single visit. A psychiatrist generally assumes the medical responsibility for all clients and/or for the direction of their mental health treatment.
Residential treatment centers for children	Facilities not licensed as psychiatric hospitals that primarily provide individually planned programs of mental health treatment in a residential care setting for children under age 18. (Some RTCs for children may also treat young adults.) RTCs for children must have a clinical program that is directed by a psychiatrist, psychologist, social worker, or psychiatric nurse who has a master's or doctoral degree.
Residential treatment centers for adults	Facilities not licensed as psychiatric hospitals that primarily provide individually planned programs of mental health treatment in a residential care setting for adults.
Other types of residential treatment facility	Refers to facilities not licensed as a psychiatric hospital, whose primary purpose is to provide individually planned programs of mental health treatment services in a residential care setting, and is not specifically for children or adults only.
Multi-setting mental health facilities	Provide mental health services in two or more service settings (non-hospital residential, plus either outpatient and/or day treatment/partial hospitalization), and are not classified as a psychiatric hospital, general hospital, medical center, or residential treatment center. The classification of psychiatric hospital, general hospital, medical center, or residential treatment center—any of which can offer mental health services in two or more service settings—takes precedence over a multi-setting classification
Community mental health centers	Provide either (1) outpatient services, including specialized outpatient services for children, the elderly, individuals who are chronically mentally ill, and residents of its mental health service area who have been discharged from inpatient treatment at a mental health facility; (2) 24-hour emergency care services; (3) day treatment or other partial hospitalization services, or psychosocial rehabilitation services; or (4) screening for patients being considered for admission to state mental health facilities to determine the appropriateness of the admission. To be classified as a CMHC, a facility must meet applicable licensing or certification requirements for CMHCs in the state in which it is located.