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BOSTON UNIVERSITY

SCHOOL OF MEDICINE

Thesis

EMERGING NEEDS IN BEHAVIORAL HEALTH AND THE INTEGRATED CARE MODEL

by

TAYLOR READ

B.S., Loyola University of Chicago, 2014

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requirements for the degree of

Master of Science

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DEDICATION

I would like to dedicate this work to Dr. Gail Levine and Dr. Tisamarie Sherry for introducing me to the integration of behavioral and primary care. My time with them at Massachusetts Mental Health Center was incredibly rewarding and it was truly inspiring to see their dedication each and every day.

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EMERGING NEEDS IN BEHAVIORAL HEALTH AND THE INTEGRATED CARE MODEL

TAYLOR READ

ABSTRACT

Medically vulnerable populations are constantly at risk of having poor health related outcomes, low satisfaction in the healthcare system and increased mortality. Studies have shown the increased prevalence rates of various medical comorbidities in patients with severe mental illness. These patients are obviously vulnerable because of their mental illness but they are also more likely to have severe cases of medical conditions commonly seen in the general population. Expenditures and utilization of resources is often inappropriate due to frequent visits for acute needs and low rates of preventative care and primary care appointments.

My proposed model focuses on the implementation of the integrated care model which encourages collaboration between mental health professionals and primary care physicians through referral programs or integrated clinic settings. This model is initiated with education to both current clinicians as well as future clinicians through medical schools and residency programs. Once the education component has begun, the next steps are formal exploration, preparation, implementation and evaluation of the model in clinics. The aim is to improve health outcomes by increasing preventative care and using behavioral techniques to assist with adherence, increase satisfaction in the healthcare system and contain expenditures by utilizing primary care services instead of emergency services when appropriate.

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LIST OF ABBREVIATIONS

ACA .... Affordable Care Act

ACCME .... Accreditation Council for Continuing Medical Education

ADHD .... Attention Deficit Hyperactivity Disorder

CME .... Continuing Medical Education

DMFT .... Decayed, Missing, or Filled Teeth

DSM-IV-TF .... The Diagnostic and Statistical Manual of Mental Disorders

EHR .... Electronic Medical Record

FFS .... Fee For Service

HIV .... Human Immunodeficiency Virus

IBS .... Irritable Bowel Syndrome

ICD9-CM . International Classification of Diseases, Ninth Revision, Clinical Modification

MSU .... Michigan State University

NAMI .... National Alliance on Mental Illness

NHIS .... National Health Interview Survey

NIMH .... National Institute of Mental Health

NSDUH .... National Survey on Drug Use and Health

OHSU .... Oregon Health & Science University

PACTs .... Patient Aligned Care Teams

PBHCI .... Primary and Behavioral Health Care Integration

PHQ-2 .... Patient Health Questionnaire

QALY .... Quality-Adjusted Life Year

SMI .... Serious Mental Illness

SSRI .... Selective Serotonin Reuptake Inhibitor

VA .... Veterans Administration

INTRODUCTION

Prevalence

There are currently 43.6 million Americans suffering from mental illness and approximately 9.8 million of those individuals are defined as having a serious mental illness (SMI) which has debilitating effects on day to day tasks ("Mental Health Awareness Month: By the Numbers"). The National Survey on Drug Use and Health (NSDUH) defines SMI as "a mental, behavioral, or emotional disorder that results in serious functional impairment, which substantially interferes with or limits one or more major life activities" and it should be noted that this excludes substance abuse and addiction related disorders ("Behavioral Health Trends in the United States: Results from the 2014 National Survey on Drug Use and Health").

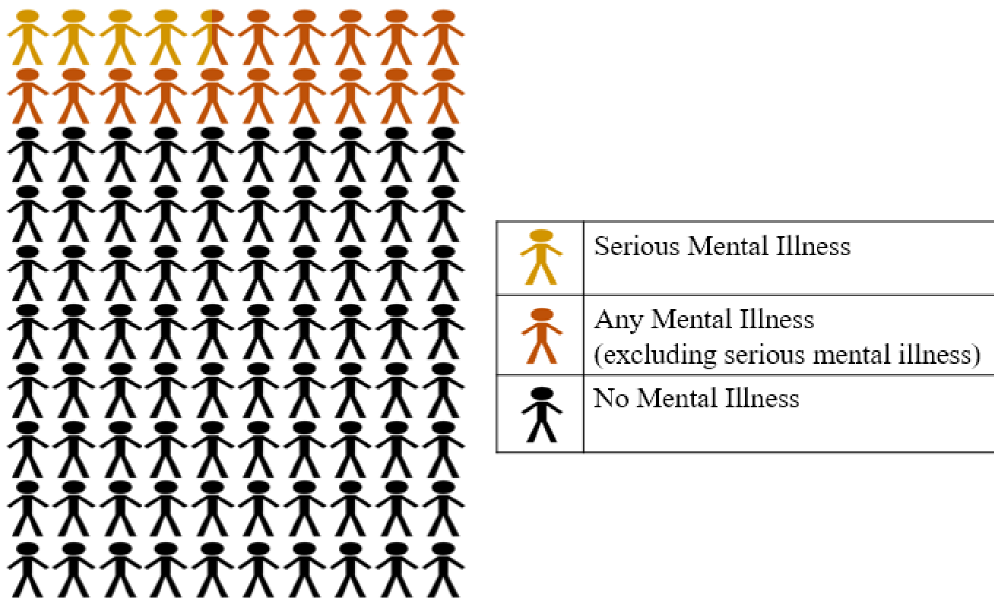

Figure 1: Prevalence of Mental Illness in the United States.

Depression in the general population is often undiagnosed likely due to lack of screening, stigma around mental health and lack of infrastructure allowing collaboration between providers. Approximately 14.8 million American adults suffer from some form of depressive disorder but only one in three seek treatment which leave roughly 10 million Americans with depression and without treatment ("Depression Statistics - Depression and Bipolar Support Alliance").

Medical Comorbidities

Patients with SMI have a 25 year mortality gap when compared to the general population (M. Viron, Zioto, Schweitzer, & Levine, 2014); this is attributable to the fact that approximately 70% of the 9.8 million patients with SMI have at least one chronic medical illness (M. Viron et al., 2014). In this population, cardiovascular disease, respiratory illness and cancer are the three main causes of premature death. While these diagnoses are not unique to patients with SMI, a large cohort study has shown that people with SMI are more likely to suffer death from these illnesses compared to individuals without SMI (Crump, Sundquist, Winkleby, & Sundquist, 2013). Patients with mental illness commonly have medical comorbidities such as chronic pain syndrome, diabetes, obesity, irritable bowel syndrome and cardiovascular disease (Razzano, Cook, Yost, Jonikas, Swarbrick, Carter, & Santos, 2015). The current practice of care separates psychiatric or mental health care into one facility and then medical care into various other clinics. This practice doesn't allow for collaboration between providers or cross-utilizing techniques from different disciplines to provide the best treatment plan for each individual patient. 1.

Health Access and Utilization

Despite the statistics proving that individuals with SMI are considered a medically vulnerable population with high prevalence of medical comorbidities, health care utilization is lower in this population compared to the general population. Lack of cancer screening and underutilization of preventative health measures have been found to be a contributing factor for increased mortality rates associated with medical comorbidities (Xiong et al., 2015). The current model of care divides mental and medical health which influences most patients with SMI to see mental health professionals on a regular basis and neglect primary care initiatives. The proposed model of integrated care allows patients, primary care physicians, and mental health providers to collaborate with one another towards a common goal of improved health in both mental and medical capacities (Padwa et al., 2015).

Health care utilization among individuals with SMI varies tremendously between primary care and emergency medical care. As described by Williams' findings, frequent visitors to emergency departments were eight times more likely to have a mental disorder than the normal population (Grabe, Baumeister, John, Freyberger, & Volzke, 2009). On the other hand, when looking at primary care, individuals with SMI are less likely than the general population to seek primary care services and if they do, they often face delays in service (Mojtabai et al., 2014).

Financial Implications

It is estimated that 27% of all mental health services are covered by Medicaid which makes them the largest payer in the United States for mental health services. This also gives Medicaid a key role in this population's health since Medicaid's coverage policy affects quality and costs of medical and mental health services (Mann, 2013). Using depression in elderly patients as an example, outpatient costs were 43-52% higher and total healthcare costs were 47-51% higher when compared to elderly patients without depression after appropriate adjustment for chronic illness (Grabe et al., 2009). Increased medical costs were also found in patients with attention deficit hyperactivity disorder (ADHD). ADHD patients' annual medical costs ranged from $4929 to $5651 while comorbidity matched controls' annual medical costs ranged from $1473 to $2771 (Kawatkar et al., 2014). Congress has been aware of the increasing cost of medical expenses associated with SMI and created legislature within the Affordable Care Act (ACA) to address the situation and provide incentives and grants for healthcare organizations (Mann, 2013). Some examples of new initiatives set forth in the ACA include tracking avoidable hospital readmission, designating a healthcare team, and utilizing health information technology to improve coordination of care (US House of Representatives, 2010).

CURRENT FINDINGS

Comorbidities

Prevalence rates of comorbid medical conditions can be difficult to accurately access since patients with SMI are underrepresented in national epidemiological studies (Janssen, McGinty, Azrin, Juliano-Bult, & Daumit, 2015). Within the past decade, several large scale studies have been performed in order to determine more accurate prevalence rates for comorbidities in patients with SMI. John Hopkins Bloomberg School of Public Health performed a comprehensive review to formulate prevalence estimates of common medical conditions among patients with SMI (Janssen et al., 2015).

The literature review followed a PICOT model (population, intervention, comparison, outcome, and time) which is the gold standard for literature review design. Since the design of the study is cross sectional, intervention and outcome are excluded from the design. This particular review defined the population as individuals with bipolar disorder or schizophrenia, both SMI, due to previous research showing increased morbidity and mortality in patients with those psychiatric disorders (Janssen et al., 2015). Expert stakeholders reviewed epidemiologic literature at the NIMH (National Institute of Mental Health) meeting in September 2012 to define a list of major medical conditions for the review. 15 medical comorbidities within the SMI population were identified: overweight, obesity, hyperlipidemia, hypertension, diabetes mellitus, coronary heart disease, congestive heart failure, cerebrovascular disease, overall cardiovascular disease,

chronic obstructive pulmonary disease, kidney disease, cancer, hepatitis B, hepatitis C, and HIV (Janssen et al., 2015).

Inclusion criteria required studies to be published in English, between January 2000 and August 2012, specific to US population age 18 or older, have a sample size of at least 100, and the population is defined as individuals with schizophrenia or bipolar disorder. EMBASE, PsychInfo, PubMed, SCOPUS, and Web of Science were utilized for the search process. Table 1 explains the outcome measures used to declare condition for prevalence rates across all the studies. Statistical analysis of the results from all 57 studies can be found in Appendix A. A main limitation of this review was the large range in prevalence most likely due to difference in outcome measures and methods between each of the studies (Janssen et al., 2015).

Table 1. Key Outcome Measures by Medical Condition.

Condition	Outcome Measures	Prevalence (%)
Overweight	Body mass index between 25 and 30 kg/m^2	31.9
Obesity	Body mass index > 30 kg/m^2	40.4
Hyperlipidemia	Any measure	27.0
Hypertension	Overall measures of hypertension	35.8
Diabetes mellitus	Fasting blood glucose > 125 mg/dl	16.1
Coronary heart disease	Any measure	7.9
Congestive heart failure	Any measure	3.6
Cerebrovascular disease	Any measure	3.1
COPD	Overall COPD	8.3
Kidney disease	Fluid and electrolyte disorders, renal failure, weak/failing kidneys, and overall kidney disease	3.0
Cancer	Any measure	2.7
Hepatitis B	Any measure	25.1

Hepatitis C	Any measure	12.5
HIV	Any measure	2.1

A large, multi-state study was organized the Department of Psychiatry at University of Illinois at Chicago; this ensured identical methods but still provided external validity by having multiple states involved. The study population involved 457 patients of publicly funded community mental health programs in Illinois, New Jersey, Maryland and Georgia. Inclusion criteria involved being age 18 or older, able to provide informed consent, having a diagnosis of SMI as defined by The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), as well being a patient of one of the four participating programs (Razzano et al., 2015). Demographic information was collected from each participant, as well as health insurance coverage type and names of diagnosed psychiatric illnesses. Comorbidity queries for the 17 medical conditions in question were phrased as “Have you ever been told by a doctor or other health professional that you had [name of condition and description]”; these were followed by additional questions in regards to whether they currently had the condition and if they received any medical treatment for that condition (Razzano et al., 2015).

Table 2 shows exact prevalence rates for the general population and study population, as well as the percentage of study participants currently on treatment for the condition. 14 of the 17 conditions showed significantly higher prevalence rates in the study population compared to the national average (Razzano et al., 2015). Some extreme findings included asthma with a greater than ten fold increase in prevalence (2.7% vs. 28.0%) and liver disease nearly five times more prevalent (1.4% vs. 6.8%). 3 of the 17

conditions did not show a significant increase in prevalence, or had too small of a sample size to determine: arthritis, tuberculosis, and HIV/AIDS.

Table 2. Prevalence of Medical Comorbidities (Razzano et al., 2015)

Medical Condition	Prevalence in national cohorts % with condition	Lifetime prevalence in study population % (n) and significance	Current treatment prevalence in study population % (n)
Arthritis	22.7 [a]	22.1 (100) ns	52.7 (48)
Asthma	2.7 [a]	28.0 (127) ***	81.1 (77)
Stroke	2.7 [a]	4.4 (20) *	42.1 (8)
Chronic bronchitis	4.3 [a]	15.0 (68)***	71.1(27)
Emphysema	1.9 [a]	4.0 (18)**	61.5 (8)
Diabetes	8.3[b]	21.3 (96)***	94.5 (86)
Ulcer	6.5 [a]	11.8 (53)***	55.5 (10)
Weak/failing kidneys	1.7 [a]	7.3 (33)***	66.6 (18)
Non-viral liver problems	1.4 [a]	6.8 (31)***	30.0 (6)
Congestive heart failure	1.0 [a]	2.6 (12)***	100.0 (11)
Other heart conditions	11.5 [a]	17.3 (79)***	93.1 (54)
Hypertension	25.9 [a]	44.1 (197)***	89.2 (150)
Any cancer	8.5 [a]	5.1 (23)**	50.0 (3)
Hyperlipidemia	38.4[c]	45.0 (198) *	82.8 (135)
Hepatitis A, B or C	1.9[d]	5.5 (25) ***	33.3 (5)
Tuberculosis	3.4[e]	3.1 (14) ns	100.0 (1)
HIV/AIDS	0.6[f]	0.7 (3) ****	100.0 (3)

[a] National Health and Nutrition Examination Survey Data (CDC, 2007); N = 195,850,985
[b] Centers for Disease Control and Prevention (2011a); N = 195,850,985
[c] Centers for Disease Control and Prevention (2011b); N = 350,000
[d] Centers for Disease Control and Prevention (2011c); N = 5870
[e] Centers for Disease Control and Prevention (2012); N = 10,528
[f] World Health Organization, UNAIDS (2013); N = 1,200,000

* p < .05
** p < .01
*** p < .001
**** n < 5 — not calculated due to low sample size

Another key finding of this study was in regards to treatment prevalence for the comorbid conditions. Liver disease was nearly five times more prevalent in the study

population (6.8% vs. 1.4%), but only 30% of the study population were receiving treatment (Razzano et al., 2015). This speaks to the medical vulnerability of the study population; patients with SMI are more likely to have comorbid diseases but less likely to receive treatment. This study was also the first to factor in racial and ethnic factors within the SMI community. Racial and ethnic minority groups were two times as likely to be diagnosed with diabetes and hypertension which coincides with national data of the general population in regards to African-Americans and Latinos (Razzano et al., 2015).

Other studies have looked at a unique population with a combination of specific medical and psychiatric illnesses. Previous research has determined approximately 20% of Medicare patients are re-hospitalized within 30 days of discharge which costs the healthcare system $17.4 billion annually (Chwastiak et al.). As this number increases, studies have looked at ways to prevent re-hospitalization by looking at the cause: inefficient inpatient care, demographic factors and lack of social support. However, limited research has been done in regards to the effect psychiatric illness plays on re-hospitalization rates. Looking specifically at diabetes, studies have shown that patients with SMI have increased mortality specific to diabetes and increased hospitalization for diabetes complications. It is believed these negative outcomes are caused by risky behaviors such as smoking, lack of exercise and poor nutrition intake, as well as antipsychotic medications causing decreased glycemic control. Under-utilization of primary care makes it difficult to address the issues stated above and increases the likelihood of a preventable hospitalization (Chwastiak et al.).

A comprehensive analysis on all hospitals in the state of Washington, excluding veteran and psychiatric facilities, was performed. 82,060 patients with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD9-CM) codes indicating diabetes mellitus were initially selected; then patients were excluded if their reason for hospitalization was maternity care or psychiatric illness, or if they had a depressive or anxiety disorder. The 1,820 patients with comorbid SMI (bipolar disorder, schizophrenia, psychotic disorders delusional disorder and non-organic psychoses) were placed into a category and compared to all patients in the study – the reference cohort (Chwastiak et al.). A major, significant finding is that the SMI cohort had a younger mean age compared to the reference cohort (55.8 years vs. 65.4 years), but a 15% greater risk of re-hospitalization (HR: 1.15, 95% CI: 1.07, 1.24). The SMI cohort was more likely to be admitted via the emergency department which speaks for the under-utilization of primary care within this population.

Another common ailment in aging populations is heart failure; which is when the heart becomes too weak to keep up with the demands of the body ("What Is Heart Failure? - NHLBI, NIH"). Heart failure is a very serious pandemic with a 10 year mortality rate of 42.8% which is equivalent to cancer. This high mortality rate also causes a large financial burden of an estimated $108 billion per year (Carter et al., 2016). In order to improve patient outcomes and lower healthcare costs, a big emphasis has been placed on determining an appropriate length of stay for inpatients with heart failure. A range of studies and initiatives have looked into dependent factors of admission length as

well as new techniques to decrease length of stay. However, limited research is available on the effects of comorbid psychiatric illness on length of stay in heart failure patients.

A study was done in North of England, UK which retrospectively identified 31,760 patients with heart failure hospitalizations out of 929,552 patients admitted to seven hospitals between January 1st, 2000 and March 31st, 2013 (Carter et al., 2016). Then patients with psychiatric co-morbidities were identified using ICD-10 codes for alcohol abuse, anxiety, bipolar disorder, dementia, depression, opioid abuse, overdose, suicide, phobic disorders and schizophrenia. 12.7% of heart failure patients were determined to have at least one psychiatric comorbidity and their length of stay was significantly longer at 14.5 days compared to the general population at 11.2 days. Heart failure patients with comorbid bipolar disorder had the greatest increase in length of stay at 20 days compared to 11.2. The findings conclude that clinicians need to be aware of comorbid psychiatric illness in heart failure patients and it expresses a need for more research on intervention techniques to balance length of stays.

Another specific area of medicine that has been studied in regards to psychiatric comorbidities is oral health. Oral health has an important link to other aspects of physical health and has been correlated with coronary heart disease, stroke, diabetes and respiratory disease (Kisely, Baghaie, Lalloo, Siskind, & Johnson, 2015). Individuals with SMI are more vulnerable to oral health concerns because of antipsychotic drugs causing dry mouth as well as social and economic factors. A comprehensive analysis of published literature was performed to determine prevalence of tooth decay in the general population compared to patients with SMI. After searching MEDLINE, PsycInfo and EMBASE for

terms such as oral health, mental disorders, tooth wear and disorders with psychotic features, over 48,000 articles were found. Citations were excluded if they were not related to the goal of this analysis, didn't have controls or if duplicate data was used; this left 25 studies to be utilized in the final analysis.

Within the 25 studies, 5,076 patients with SMI were compared to 39,545 controls (Kisely et al., 2015). Edentulism, or being toothless, was found almost three times as frequently in SMI patients than controls (OR = 2.8, 95% confidence interval, [CI] = 1.7-4.6). Decayed, missing or filled teeth (DMFT) scores were also higher in SMI patients (mean difference of 5.6 with a maximum possible score of 32). It should be noted that the prevalence of decayed or missing teeth was significantly higher but filled teeth was not, this supports the hypothesis that patients with SMI are not receiving adequate professional dental care. Another study found that dental issues are the most common cause of avoidable hospitalizations accounting for 20% of all admissions; this rate is even higher among SMI patients. By increasing dental hygiene in SMI patients, physical health will be positively benefited and avoidable hospitalizations will be decreased. These measures are valuable because they will improve patient health and decrease healthcare expenditure by avoiding admissions.

Access and Utilization

As described above, patients with SMI are more likely to have comorbid medical conditions; access and utilization of medical care within this population is a large focus for analysis in order to determine potential causes for the increase in conditions. One way of measuring healthcare access is to use a surrogate marker such as appendicitis rupture because patients whom properly utilize the healthcare system would have the appendicitis addressed and avoid rupture (M. J. Viron & Stern, 2010). Elevated rupture rates are expected in uninsured and elderly patients, and a large study in Taiwan found that schizophrenic patients were 2.83 times more likely to have appendicitis rupture when compared to the general population. Barriers to healthcare can be found on patient, provider and system levels.

Patient barriers vary tremendously depending on the psychiatric diagnosis and demographics of the patient. Genetic components of mental illness have been proposed due to physiological patterns noted in patients that are not on any antipsychotic medications (M. J. Viron & Stern, 2010). For example, glucose intolerance was noted in schizophrenic patients, and variability of heart rates and increased platelet adhesiveness is known in depressive populations. Symptoms associated with SMI also affect a patients' view of their own health as well as the health system in general. Many patients suffer from lack of motivation, disorganized thought processes and/or cognitive impairment that can make it difficult to communicate concerns with clinicians and navigate the healthcare system. Tasks that seem simple, such as remembering appointment dates and times, can prove to be a challenge for patients with SMI. Education also plays a pertinent role as

patients with SMI are less likely to finish high school and approximately four times more likely to be unemployed. Tumultuous life situations such as poverty (40%), homelessness (20%) and being victim to violent crime (25%) also plays a detrimental role on the wellbeing of patients with SMI (M. J. Viron & Stern, 2010).

Doctor patient relationships are crucial and establishing trust and respect impacts the healthcare dynamic in vital ways. Unfortunately, some clinicians have lack of experience and training with mentally ill patients and can find them "difficult and time consuming" or feel generally uncomfortable (M. J. Viron & Stern, 2010). 15% of patients with SMI stated they were concerned about being treated differently by clinicians due to their mental health illness (Mojtabai et al., 2014). Clinicians might also possess biases about SMI patients that lead them to believe the patient isn't able to be a contributor to the healthcare team. One studied aspect of clinician discriminatory behavior is called diagnostic overshadowing which is when a clinician associates physical symptoms with a patient's mental illness instead of a medical reason. This same theory has been found in surveys when family physicians were given potential scenarios and asked to respond, they were less likely to believe the patient had a serious medical issue if they had mental health issues in their medical record. Even though this discrimination may be unconscious or subtle, it is being picked up by patients as shown in the National Alliance on Mental Illness (NAMI) survey where 49% of patients with schizophrenia felt doctors lost trust with them after they shared their psychiatric diagnoses (M. J. Viron & Stern, 2010).

The final collection of barriers is seen at the systemic healthcare level. Separation of mental and medical health in regards to insurance and billing as well as in patient care settings has created a detrimental divide in patients' total wellbeing. Fortunately, electronic health records have helped decrease the lack of cross communication between practices; but this is still extremely limited to practices within the same system or even hospital affiliation (M. J. Viron & Stern, 2010). Surveys have also shown that patients with SMI have expressed difficulty navigating complex medical systems with offices, locations and staff changing at each visit (Mojtabai et al., 2014).

One trend that has been of major concern is the overuse of emergency departments in contrast to the underuse of primary care clinics. 37% of patients with SMI have been to an emergency department within the last year compared to only a 20% prevalence in the general population (M. J. Viron & Stern, 2010). Another study specific to the elderly population found that SMI patients were almost twice as likely to visit an emergency department when compared to a patient without SMI but with otherwise similar medical conditions (Hendrie et al., 2013). Emergency room visits aren't the only hospital factor affected; SMI patients also have longer length of stays when compared to non-SMI patients. A UK based study discovered that patients with SMI were less likely to receive preventative health measures from the primary care physicians, such as diet and exercise tips, smoking cessation advice and diagnostic health monitoring (M. J. Viron & Stern, 2010), when compared to patients without SMI. This issue is not unique to primary care; psychiatrists who are knowledgeable about antipsychotic medications were found to infrequently screen for common drug side effects such as weight gain.

Increased acute care and decreased preventative care is concerning on its own, but it has been of special concern with the aging population. A five year prospective analysis found that SMI patients who had high rates of health care utilization at the beginning of the study had an even greater rate at the end of the five years (Grabe et al., 2009). With the projected growth and aging population of SMI patients, different approaches need to be verified to avoid healthcare system stress in upcoming years. A similar cause for concern has found in a prospective study of adults with ADHD (Kawatkar et al., 2014). The study found that adults with only ADHD usually gained an additional mental health diagnosis; this point is referred to as the mental health transition date. While comparing pre-transition data to post-transition date data, the number of visits increased significantly. Significant increases were also detected in emergency department, inpatient, and prescription expenditures. A significant total increase in expenditure was found with initial costs being an average of $1822 which was increased to $4177 after the transition date. The only statistically significant decrease was behavioral therapy visits which went from an average of 2.15 visits pre-transition to only 0.79 visits post-transition.

Johns Hopkins performed a cross sectional comparison of utilization trends to ascertain reasons why there is such a discrepancy between SMI patients on the general population (Mojtabai et al., 2014). SMI patients expressed a greater prevalence of delays when attempting to access medical care when compared to the National Health Interview Survey (NHIS) participants. More specifically, SMI patients were more likely to express delays in receiving appointments (33% compared to 6%), issues with transportation (27%

compared to 3%), long waiting times (25% compared to 6%), difficulty reaching clinic via phone (22% compared to 3%) and the clinic not having convenient hours (15% compared to 3%). In the NHIS cohort, only 13% expressed delays due to one of the above issues; in contrast to the 53% of SMI patients who reported a delay. Patients who reported delays were more likely to utilize emergency departments and self-report their health as poor or fair.

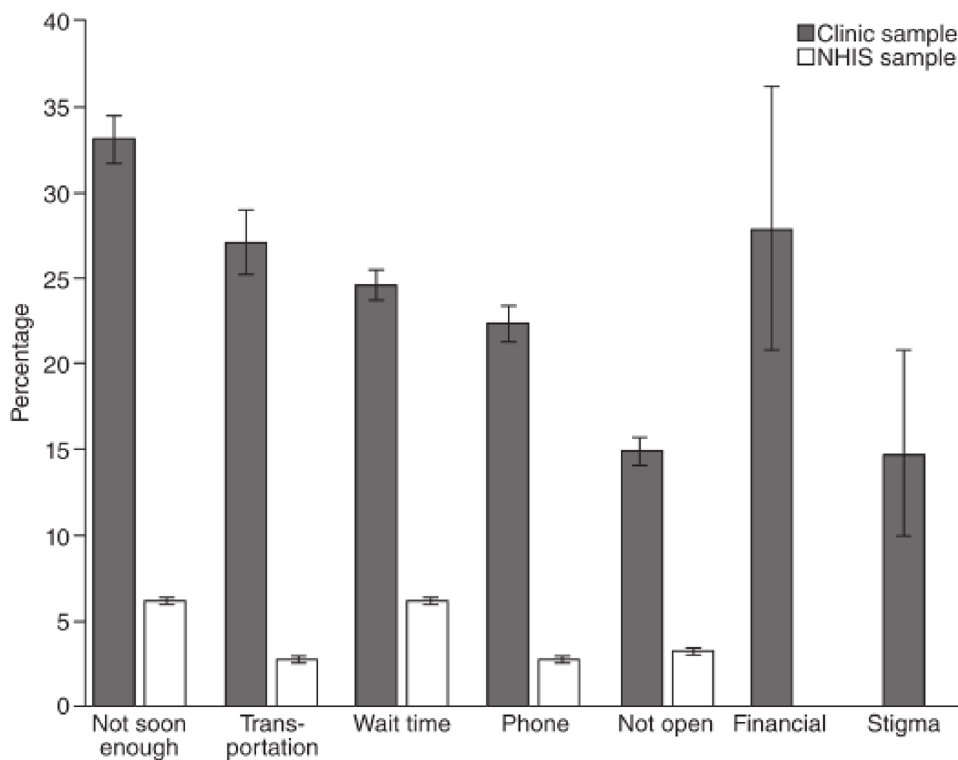

Figure 2: Reasons for Delays. (Mojtabai et al., 2014)

Cost

Despite patient outcomes and satisfaction being the primary focus, the astronomical health care expenditure cannot be disregarded. Depression alone accounts for $70 billion in healthcare expenditure and almost $12 billion in lost workdays annually ("Depression Statistics - Depression and Bipolar Support Alliance"). Patients with chronic illness, whether that be SMI or medical conditions, have higher healthcare expenditures as expected but necessary visits. However, by implementing an integrated care model and emphasizing preventative care these costs can be contained instead of the rapid incline currently seen.

A meta analysis was conducted on ten studies that looked at the outcomes of integrated care models implemented in outpatient clinics (Lemmens, Molema, Versnel, Baan, & de Bruin, 2015). Seven were randomized control trials and the remaining three compared statistics from before and after implementation but without a control group. Table 3 shows the length of follow up for each of the studies. One of the randomized control trials used data from fourteen primary care clinics across the nation and concluded that an integrated care program would be below the $20,000 per quality-adjusted life year (QALY) which is deemed cost effective.

Table 3. Length of Follow Up for Cost Effectiveness Studies.

Number of Studies	Length of Follow Up
4	Less than 12 months
3	12 months

1	18 months
1	Some outcomes at 12 months and some at 60 months
1	12, 18 and 24 months

An indirect cost saving measure is seen by decrease in hospital admissions as well as shorter lengths of stay for patients admitted. Data shows that patients with SMI have more frequent hospitalizations and longer length of stay upon being admitted(Carter et al., 2016)**.** Pilot studies using the integrated care models found emergency room visits decreased by 11%, hospital admissions for medical conditions decreased by 56% and hospital admissions for psychiatric conditions decreased by 43% which correlates to a decrease in healthcare expenditure (Lampert, 2015).

Integrated care model

Recent development has been made in proposing a new model for primary care that involves integration of mental health – the integrated care model. Depending on the framework and infrastructure of the health setting, there are three different definitions proposed: coordinated care, co-located care, and integrated care (M. Viron et al., 2014). Coordinated care is defined as separate primary care and mental care settings but care managers communicate between the two practices to collaborate on patients' needs. Co-located care still has a division between primary care and mental health care, but they are located within the same building or office. For this type, the primary care is usually brought to the mental health center setting. Integrated care is the most cohesive of the three; it is defined as being in the same location, using the same medical record technology, shared funding and having consistent communication between providers.

The Primary Care Access, Referral, and Evaluation study was a yearlong randomized control trial assessing the proposed benefits of coordinated care in patients with SMI (Druss et al., 2010). Over 400 patients were randomized into two groups: usual care that involved handing out pamphlets for suggested primary care clinics and medical care management which consisted of mental health nurses providing coordination for primary care visits. After 12 months, patients in the medical care management group had a higher prevalence of preventative health services, primary care visits and mental health quality of life scores while having decreased Framingham Cardiovascular Risk Scores. These scores use data from the Framingham Heart Study to use a patient's gender,

cholesterol, systolic blood pressure and smoking status to predict their chance of having a heart attack in the next ten years ("10-year CVD Risk Calculator (Risk Assessment Tool for Estimating Your 10-year Risk of Having a Heart Attack Version)"). After 12 months on the coordinated care model, patients indicated a 58.7% prevalence rate for preventative care services which is a statistically significant increase from 21.5% at baseline (Druss et al., 2010). The increase in primary care also contributed to higher scores in regards to mental health, general health, social functioning, vitality, and role-emotions.

The Affordable Care Act (ACA), has provided incentive for mental and medical collaboration as a way of increasing access to care and improving patient outcomes while maintaining healthcare costs (Padwa et al., 2015). Initiatives such as the Primary and Behavioral Health Care Integration (PBHCI) grants provided grantees $500,000 per year for four years to implement integrated primary care into mental health facilities (Scharf et al., 2013). Requirements for the grant included screening, assessment, and referrals for the prevention and ongoing treatment of medical conditions such as hypertension, obesity, smoking and substance abuse. There were 56 grantees; most were defined as having one treatment site (61%) and being in urban or suburban environments (84%). Figure 3 shows the distribution of barriers at start up and at one year follow-up. At baseline, common barriers included hiring and retaining certified staff members and proper data sharing and managing with electronic health records (EHR).

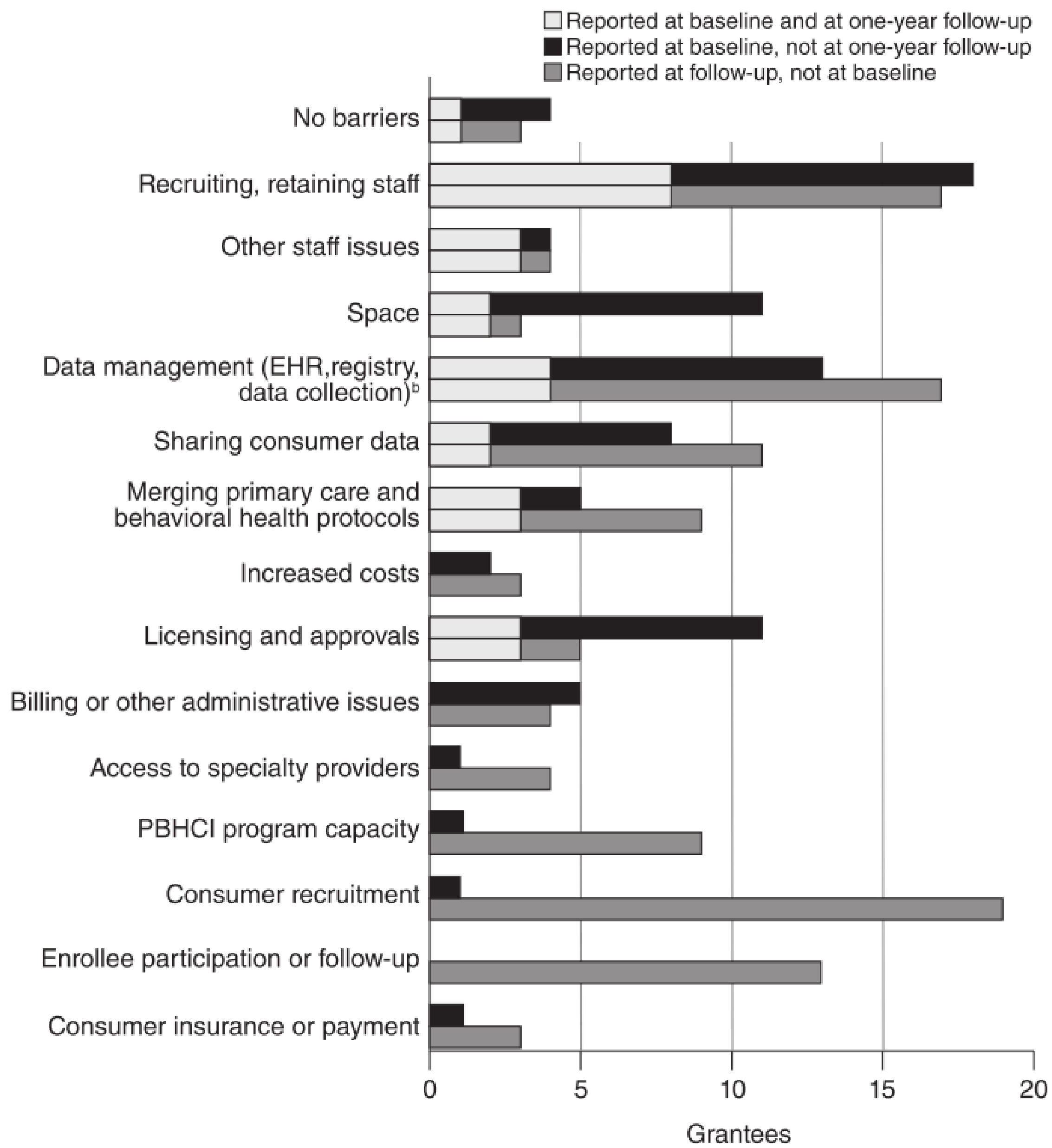

Figure 3: Barriers to Program Implementation.

Sites that brought primary care physicians into mental health facilities expressed a barrier due to space limitations but most considered that issue resolved within the first year. Another major barrier was recruiting and retaining qualified, licensed staff members at baseline but also after a year. Barriers were also noted in the patient population; approximately 25% of sites reported a difficulty with keeping patients engaged in the new program model (Scharf et al., 2013). These numbers suggest the necessity for more education on integrated medicine for both consumers and providers.

Another example of ACA encouraged reform can be seen in New York during 2012 when Medicaid reform occurred. Health home options were implemented as directed by ACA which were for patients who had two or more chronic medical issues or one SMI (Smith, Erlich, & Sederer, 2013). In New York, there are over 800,000 people who qualify for health home systems of care which provide coordination of medical and mental health care, improved patient satisfaction, quality of life and controlled cost. Each patient in a home health system has an assigned coordinator who is required to make an individualized and comprehensive health plan for all providers involved with that patient's care. The goals of this integration process are to provide improved access to primary care, substance abuse treatment, and mental health services across the state of New York while containing costs at a time when healthcare expenditure continues to grow exponentially.

The big picture goal is to promote collaboration between mental and medical healthcare, but it's important to understand the specific ideas suggested in order to reach that goal. One area of focus is increasing antidepressant adherence rates by implementing

an automated phone system to remind patients to refill their prescription at appropriate times (Azrin, 2014). Another area of improvement aimed at patients with depression is providing care over the phone. Patients who are prescribed antidepressant medications but are not receiving psychotherapy will be identified and provided a clinician who manages therapy over the phone. This increases access to mental health care, provides patients with more depressive free days and has proven to decrease healthcare costs over a two year period. Self-management is another area that has shown promising results when looking at patients with SMI and comorbid health conditions. In 45 minutes clinicians can be trained in self-efficacy-enhancing interviewing techniques (SEE IT) which empowers patients to play a role in managing their chronic conditions and is a low cost option with a lot of potential.

Thus far, literature analysis has focused on adults with SMI. However, it is important to recognize the similarities and differences in mental and medical health needs of adolescents and children as well. A systematic literature review of clinical trials was performed to determine if integrated care models improved outcomes in children when compared to typical primary care measures (Asarnow, Rozenman, Wiblin, & Zeltzer, 2015). Over 13,000 patients in 35 case-control studies were utilized to draw conclusions. Study samples ranged from 28 to 3,111 patients, twenty-five compared treatment strategies with twenty being specific to mental health and five on substance use. The remaining ten studies involved prevention as opposed to treatment models.

Statistical analysis showed that there was a 66% chance a child would have better mental health outcomes if they received an integrated care model compared to traditional

care (Asarnow et al., 2015). Analysis was not as conclusive for substance use trials, with only one study showing significant improvement with an integrated care approach. Prevention trials were even less conclusive with only one substance use study showing minimal significance; this showed the need for larger study samples in prevention trials. The conclusion of this meta-analysis is that collaborative care programs are beneficial to most children and adolescence for mental and physical well-being. This includes a collaborative community of mental health professionals, pediatricians, and case managers working together to evaluate, treat and prevent.

Even though integrated healthcare is a new concept, there are a few successful examples of programs throughout the nation. A large scale program is seen in Veterans Administration (VA) known as patient aligned care teams (PACTs) (Lampert, 2015). These include primary care physicians and mental health professionals collaborating over a patient's care plan. The VA also incorporated technology into their PACTs by using software to determine if they should watch mental health concerns, treat at the primary care level or refer to a specialist.

Lone Star Circle of Care in central Texas is an incredible example of multifaceted collaboration between medical, mental and dental health (Lampert, 2015). They have integrated behavioral health needs with primary care to provide a cohesive health plan; they even have specialties in women's health, pediatrics and medication payment options.

One limitation noticed in this model is the selective nature; for example patients might only be able to utilize the primary care facility if they are receiving psychiatric services at the clinic. California's Golden Valley Health Centers created a "no wrong

door" policy which allows any physician to make a referral to their health center (Lampert, 2015). They also provide same day appointments for behavioral health needs which is an area lacking significantly in terms of accessibility. These centers are staffed by mental health professionals, psychiatrists, primary care physicians, addiction specialists, case managers and outreach workers to provide a one-stop center for patients.

One last example is in Pennsylvania and is a two-year pilot program known as wellness recovery teams (Lampert, 2015). The goal is to provide a patient navigator to Medicaid patients with a SMI and a chronic medical condition in order to help guide and accompany patients through the medical system. Relationships are created between various physicians and mental health clinicians to connect and collaborate on the patient's care goals. After only six months promising numbers were discovered; emergency room visits decreased by 11%, hospital admissions for medical conditions decreased by 56% and hospital admissions for psychiatric conditions decreased by 43%.

Training

With an understanding of the emerging issues and proof of concept shown in pilot programs, focus can shift towards necessary training and implementation. Education goals fall into two broad categories: current practicing clinicians and future clinicians. With most mental health care being provided by primary care physicians as opposed to psychiatrists, it is imperative that primary care physicians receive training in order to confidently handle mental health issues (Zoberi, Niemiec, & Margolis, 2008). University of Colorado conducted a six question survey to 73 clinicians in order to gauge their perceptions on integrating mental health into primary care (Torrence et al., 2014). 45 providers responded to the survey (62% response rate), with the majority being women (69%) and Caucasian (82%). The survey asked clinicians to select the extent to which they agree with statements about collaboration with behavioral health consultants within their practice. The complete survey can be found in Appendix B.

For all survey items, 73.3% to 100% of clinicians either agreed or strongly agreed with the statement. Chi-square analysis determined that clinicians who worked with behavioral health consultants more frequently were more likely to strongly agree that working with behavioral health consultants has increased their comfort in discussing mental health issues with their patients. It is important to recognize the limitations of this study's external validity since all clinicians surveyed work with behavioral health consultants on a weekly basis. However, this is also an important aspect going forward; proving that clinicians find this relationship valuable to their clinic dynamic and patients directly.

Physicians' attitudes and perspectives play a key role in the treatment patients receive; providing education will decrease biases towards patients with SMI in order to ensure all patients receive the best care possible. A study was conducted that had actors serve as patients to portray different types of patients including one with schizophrenia with atypical behavior (Welch, Litman, Borba, Vincenzi, & Henderson, 2015). Analysis also discovered that nearly 40% of physicians believed that patients with schizophrenia were incapable of making decisions with regard to their health. Although this may be true in severe, untreated cases, those circumstances are not the norm as many patients with schizophrenia are well treated and capable of making informed medical decisions.

Furthermore, physicians ask more questions about complaints and family history in patients with depression or eczema compared to schizophrenia (Welch et al., 2015). Also, physicians are more socially disconnected with women who have schizophrenia than men with schizophrenia (Welch et al., 2015).Both of these findings are a result of uneducated bias that impairs a physician's ability to properly treat and care for their patients. Educating current and future physicians on psychiatric illness could mitigate this bias and allow primary care physicians to provide equitable care for patients with SMI.

University of Massachusetts conducted a survey of practicing physicians which provides insight into the views towards integrated medicine (Astin, Soeken, Sierpina, & Clarridge, 2006). When physicians were asked if their formal medical training was helpful in regards to including behavioral techniques into their practice, only 25% said yes, their medical school and residency programs were useful. The same group of doctors

was asked about their interest level when it comes to learning more about behavioral techniques integrated into medical care and 66% had moderate, high or very high interest. With this data we can conclude that most physicians feel inadequately trained but are eager to learn more.

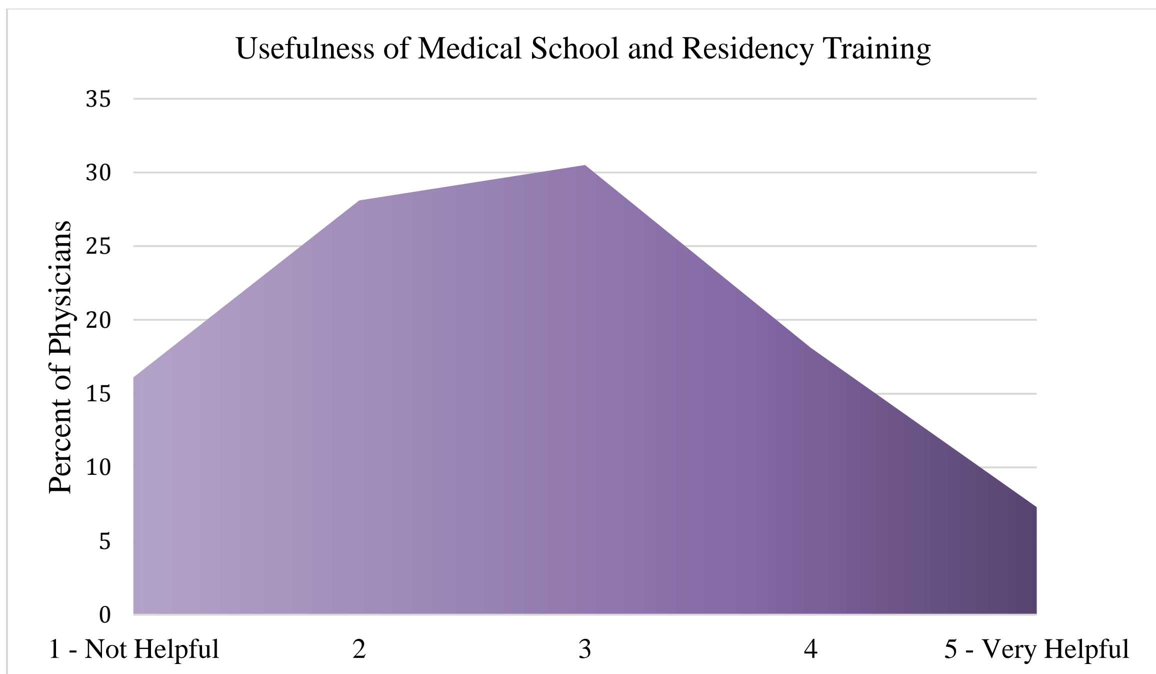

Figure 4: Usefulness of Medical Training to Include Psychosocial/Behavioral Methods in Treatment.

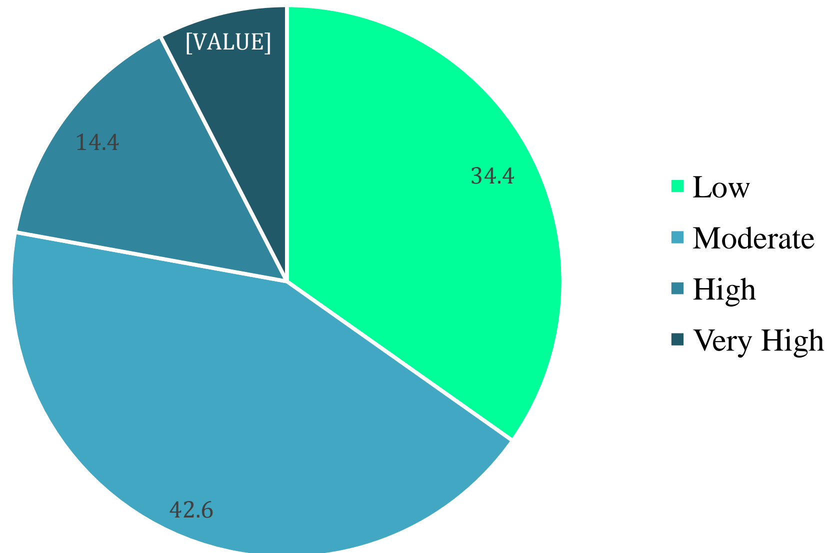

Figure 5: Level of Interest in Receiving Further Training in Mind-Body Medicine.

Fairleigh Dickinson University in New Jersey offers current primary care and mental health clinicians an online certification to understand the fundamentals of integrated care and the necessary steps to implement and maintain the model in their own practice (Lampert, 2015). The course has a flexible timeline due to its online format and requires 5 sections over the course of twenty weeks; clinicians are granted eighty continuing medical education credits upon completion.

While education to current clinicians is important, training for future clinicians is crucial when reshaping a medical infrastructure. Michigan State University (MSU) and Oregon Health & Science University (OHSU) created family medicine program

curriculum to train residents in integrated healthcare (Romain, Muench, & Phillips, 2015). Both programs shared five objectives as stated below.

1. Residents will develop advanced skills in caring for patients with severe and persistent mental illness.
2. Residents will confidently care for patients in alternative care settings.
3. Residents will gain experience coordinating care across the delivery system.
4. Residents will routinely integrate both mental health and physical health care into their practices.
5. Patients will have access to comprehensive primary care services in settings that are convenient and comfortable.

MSU residents were located at Birch Health Center which is a primary care office located inside a mental health system within the community. OHSU residents were not in a specific clinic but instead tailored to patients within group home facilities. Table 4 provides an overview of the curriculum and gives examples of each.

Table 4. Residency Program Curriculum. (Romain et al., 2015)

Topic	**Content**	**Examples**
Psychopharmacology and substance misuse	Comprehensive psychiatric medication management, with special emphasis on antipsychotics	Lithium dosing Managing antipsychotic side effects Use of non-SSRI antidepressants Treatment-resistant depression Use of alcohol and substance misuse screening tools
Patient centered communication	Advanced skills in patient centered communication	Helping a patient with severe claustrophobia, social anxiety, and

	and shared decision making with patients with low socioeconomic status, low health literacy, or cognitive impairment	panic disorder decide whether to obtain an MRI Coaching a patient through the risks and benefits of stating at a homeless shelter, versus staying in an unsafe house
Health disparities	Morbidity and mortality experience by patients with low socioeconomic status, low health literacy, or cognitive impairment	Discussion of smoking cessation at nearly every visit Diagnosis of disease at later stages because patients did not obtain necessary screening or postponed diagnostic testing
Health literacy	Assessing health literacy and modifying patient education appropriately	Use of drawing, pictures, or videos for patient education Use of personalized visual medication charts
Interprofessional collaboration	Collaborating effectively with a comprehensive care team to best assist complex patients	Nurse practitioner consulted with resident and physician for difficult medical cases Residents taught medical assistant to educate patients
Ethical issues	Creating a comfortable environment with learners present Ethics of treating vulnerable populations	Navigating coerced hospital admissions for medical problems Medical assistant ensured patients were willing to see residents and students; attending physician greeted every patient Decision-making capacity
Physician resilience	Developing self-reflection skills Managing caregiver fatigue and personal boundaries	Debriefs after emotionally difficult encounters Residents encouraged to write about the program in their personal reflections, a residency requirement

A formal evaluation of the OHSU residency program was not completed but feedback was provided by group home leaders who worked closely with the residents. One leader expressed that, “the service provided by the residents…is one of the most valuable services implemented for our residents at [facility]. Often…clients are opposed

to medical treatment recommendations, which gave the primary care residents some exposure about how to address those barriers while in the clinic setting" (Romain et al., 2015). Residents in the MSU program were asked to provide feedback upon the completion of their rotation. Positive aspects of the program were identified as working with underserved patients, managing both psychiatric and chronic illness, having a greater awareness of patients' health care costs and caring for patients with low health literacy. Both programs were deemed a success and believe other primary care residency programs should follow suit and collaborate with local partners to provide service to the community and education to senior residents.

Although the MSU and OHSU model was well received, less intensive options are also available to train primary care residents in integrated healthcare. Saint Louis University School of Medicine implemented a quick 90 minute curriculum to train primary care residents in various behavioral medicine areas (Zoberi et al., 2008). The first topic addressed in the course was anxiety since it is one of the most common mental health illnesses seen in a primary care setting. The first lesson is to accurately differentiate the anxiety diagnosis to identify if the patient has generalized anxiety disorder, panic disorder, social phobia or post traumatic stress disorder. Students are taught the high prevalence rates of comorbidities and then they delve into treatment options and the risks and benefits of benzodiazepines. Quick cognitive behavioral therapies such as recording thoughts and self-monitoring are taught as well as brief ways to teach patients about anxiety while dealing with the time constraints associated with primary care clinics.

Next on the class agenda is depression which starts with a very quick discussion on diagnosing depression since most students are familiar with this process from previous medical curriculum (Zoberi et al., 2008). Instead, the focus is on brief, efficient depression screening and treatment options. The Patient Health Questionnaire (PHQ-2) is a validated screening tool with only two questions that is used to assess depression in patients (Kroenke, Spitzer, & Williams, 2003). Below is an example of the two item screen:

Over the last two weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless

Answer options for each question: not at all (0), several days (1), more than half the days (2), and nearly every day (3). 0-3 range for both questions gives an overall range of 0-6 for PHQ-2 score. It is important to note a limitation that this is simply for screening purposes and a diagnosis requires more in depth questions and observations. Treatment options are also covered to address varying patient opinions on medications, all behavioral or a combination approach (Zoberi et al., 2008).

The next topics in the curriculum have a more obvious medical influence in the importance of integration. First is low libido which increases in an almost exponential pattern as women age as seen in image 6 below (Zoberi et al., 2008). Students are first taught to rule out medical causes for patient low libido including hypothyroidism, depression, selective serotonin reuptake inhibitor (SSRI) use and pain disorders. Next the

benefits and risks associated with hormone replacement therapy are addressed and behavioral approaches are introduced as a safer alternative to addressing emotional issues affecting libido.

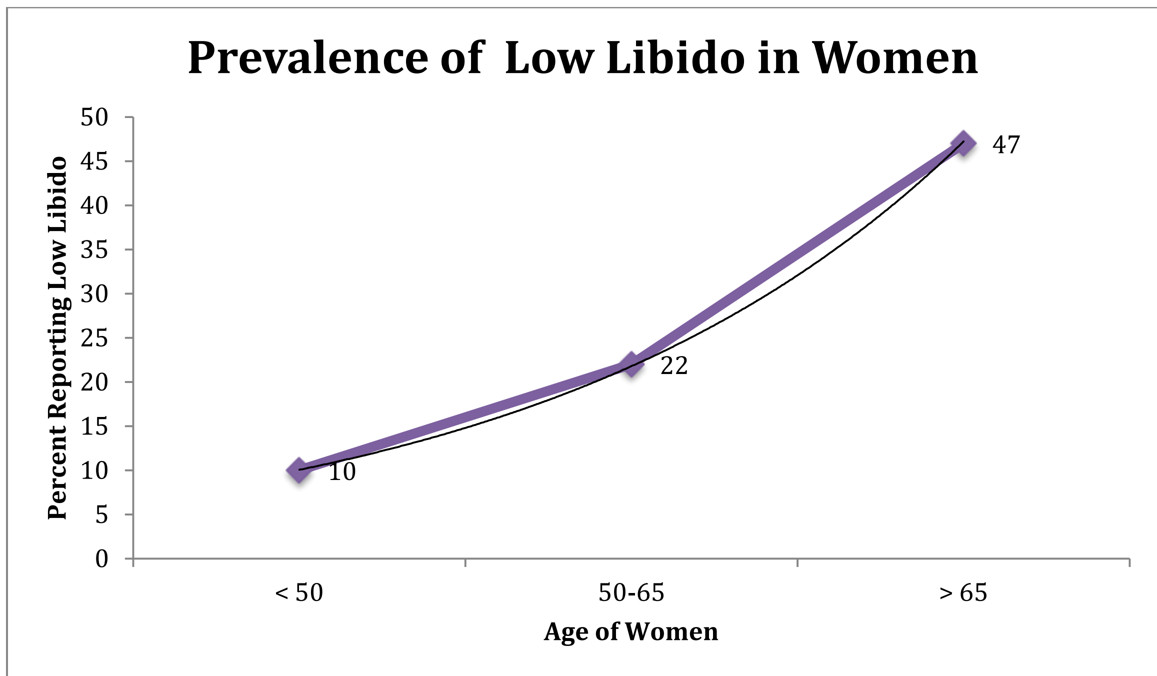

Figure 6: Prevalence of Low Libido in Women.

Irritable bowel syndrome (IBS) is a prime example of an ailment that strongly benefits from both pharmacological and mental interventions which would be provided in an integrated care model (Zoberi et al., 2008). Clerkship students are trained first in medical treatments such as dietary modification, constipation or diarrhea medications, as well as anticholinergics, antidepressants, and antianxiety medications used for the pain, cramping, anxiety and depression associated with IBS. Hypnotherapy is then taught to

clerkship students and research is presented to explain the strong success rates over the last 30 years. In the integrated model a home version of hypnotherapy is taught to the patients so visit count is decreased from roughly ten to three which helps the aim to contain healthcare expenditure (Zoberi et al., 2008).

At the end of the academic year, a total of eighty-four clerkship students attended the brief family medicine introductory course in family medicine (Zoberi et al., 2008). A short test was given to students before and after to assess the efficacy of the course. Seven of the eight questions had a statistically significant improvement after students took the course. The average went from 2.5 out of 8 (31%) questions answered correctly to 5.4 out of 8 (68%). Students appreciated the quick interventions for topics that are uncomfortable to talk about, such as low libido; and found the variety of interventions helpful when choosing a treatment plan for their patients. A major limitation in this approach is the brief overview nature; numerous areas were addressed but time didn't permit any in-depth discussions.

DISCUSSION

Implementing a new model is often costly given the need to redefine infrastructure; this has been seen as a major drawback despite the promising results for integrated care models. A benefit of collaborative care as opposed to co-located is the expense; mental health clinics can create relationships with outside primary care facilities without having to reorganize their own clinic to incorporate medical facilities (Druss et al., 2010). This also comes with its own limitations because the mental health clinic is dependent on availability of primary care physicians in the surrounding area. Collaboration is beneficial to the mental health clinics because of the proven link in mental health outcomes by increasing medical healthcare.

In order to understand the process of integration from start to finish, a study was done that divided the model into four phases: exploration, adoption/preparation, implementation and sustainment (Padwa et al., 2015). Two major barriers were funding mental health services in primary care and confidentiality concerns caused by sharing patient files. More concrete barriers such as space constraints also limited practices' ability to transition to integrated care models. As mentioned previously, physician views of patients with mental illness plays a strong role in their desire to foster an integrated model which would bring more of this patient population into their clinic. This is caused by a poor understanding of mental illness, a stigma against these patients and lack of desire to treat patients with SMI.

My proposal for initiating integrated care between mental health and primary care is a two arm process with the first arm being education and training and the second arm being clinic implementation.

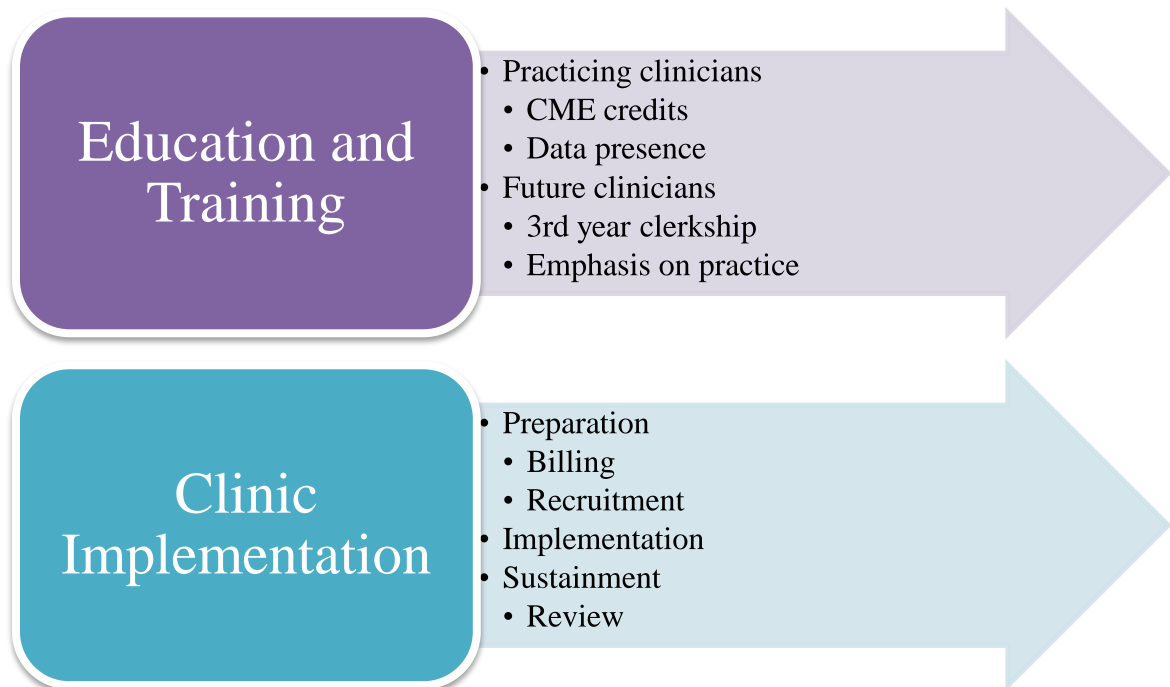

Figure 7: Proposed Model for Integrated Care.

This model was formulated to address the issues found in current literature about physicians' attitude and behavior towards patients with SMI as well as the medical outcomes, financial aspects, and patient satisfaction that improves when mental and medical health professionals collaborate. Specific aims of this model are to improve outcomes, increase patient and clinician satisfaction and be more cost effective (Ratzliff, Phillips, Sugarman, Unu tzer, & Wagner, 2015). Overall, this is created with two specific

populations in mind. The first group is patients with SMI who seek psychiatric care but have low healthcare utilization in regards to primary care; by integrating services preventative care rates will increase, management of chronic conditions will improve and emergency room visits will decrease. The next group is patients who maintain a relationship with their primary care physician but do not currently utilize mental health services; integrated care will decrease undiagnosed depression rates as well as maintain healthcare expenditure for patients with frequent healthcare utilization.

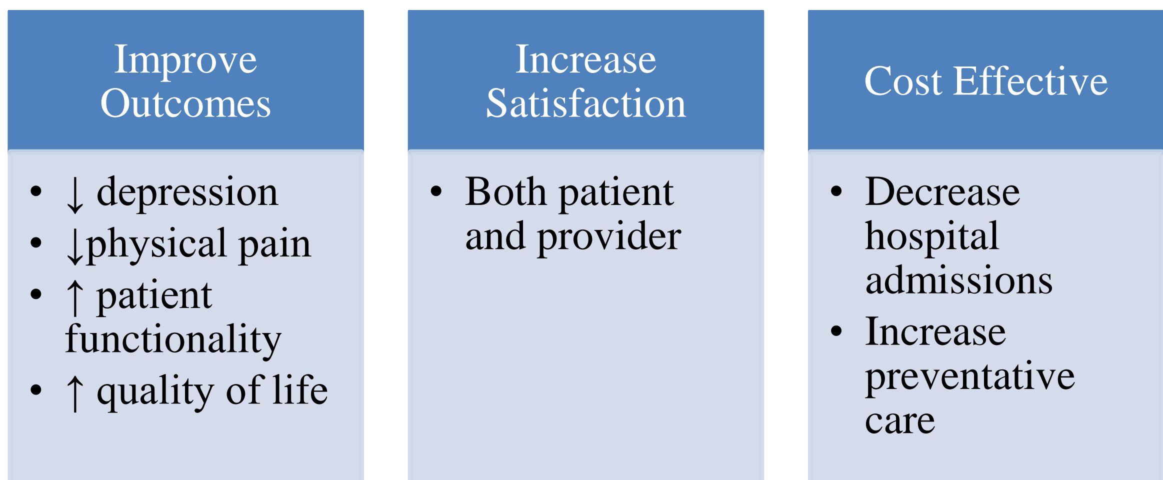

Figure 8: Aims of Proposed Model.

The first arm of the proposed model is training and education of future and current clinicians. While these two steps can occur concurrently, current physician training should be initiated first to allow for mentorship opportunities with medical students and residents. Continuing medical education (CME) are required credits to maintain licensure that maintain competence in skills and provide opportunities to learn

new knowledge and techniques ("About Us | Accreditation Council for Continuing Medical Education"). Requirements vary by state; for example Massachusetts requires 100 credits every two years with at least 10 risk management credits and 2 end of life care credits ("State Requirements"). CME courses would be an excellent avenue to educate current clinicians while enticing physicians with CME credits.

The first step in this process would be to seek accreditation from the Accreditation Council for Continuing Medical Education (ACCME). The course would be provided online through various training modules that are interactive and have brief quizzes to test comprehension along the way. The first lesson will have a lot of statistics and examples of the current disparities caused by segregation of medical and mental health resources. This is crucial because clinicians need to see and comprehend the current problem since many are simply unaware and/or used to a routine with their current practices. Clinicians will then be informed of the different integration types such as co-located and co-integrated. It is important to provide examples of successful clinics as well as simple steps clinics can take to care for their patient population better if fully integrating two clinics isn't an option currently. Clinicians will be provided a GROW worksheet which has questions about goals, resources, options and workflow to help determine the most appropriate pathway for integration based on the abilities and limitations of a specific clinic (Ratzliff et al., 2015). Appendix C has the full GROW pathway worksheet.

It is understood that one clinician cannot usually make executive decisions to adapt a clinic into a collaboration model. Therefore, the next module in the CME course

will provide tips for talking with health care administrators, other physicians and funding agents. Tools are provided to insert expenditure data relevant to each state to determine if billing same-day behavioral health services will cover the costs associated with integration (Ratzliff et al., 2015). At the end of the course there will be several short videos to choose from that are of physicians, patients, and mental health professionals who chose to share their stories about the challenges and successes of integrated care.

Next we will switch our focus to future clinicians, specifically medical students. The proposed model is for all third year medical students to attend a week long integrated care clerkship as part of their family medicine rotation. Statistics and examples will still start off the course similar to the CME version, but not to the same extent as the focus is different with this group. The true focus will be on learning about behavioral and mental health issues in primary care and learning simple techniques to provide patients with the best care possible. The curriculum is modeled off of Saint Louis University's brief ninety minute overview but will allow more in-depth coverage of conditions such as anxiety disorders, depression, irritable bowel syndrome, diabetes and hypertension.

The medical students will also be required to attend three shifts in an established integrated care center during their rotation which will provide them with hands on experience and improve their confidence and comfort level with SMI patients. While the number of integrated care centers is still low, medical students will be assigned to this unique one week rotation at different weeks within their eight week family medicine clerkship. This will allow all students to receive individualized learning opportunities in

the clinic setting and avoid putting too much stress on the clinic with an abundance of medical students.

Education and training is crucial to teach current and future clinicians about the benefits and importance of integrated care, but without actual implementation of practice within clinics there will be nowhere for these integrated clinicians to collaborate. That brings us to the next arm of the proposed model: clinic implementation. We will walk through each step individually but the process overview is exploration, adoption and preparation, implementation and sustainment. The exploration phase includes educational components expressed above, conversations with decision makers and studying current clinics to determine the best level of integration for the needs of the patients and resources of the clinic.

Once a decision has been made to provide integrated healthcare the adoption and preparation phase has begun. The first step in this phase is to recruit the necessary staff members to provide and support for the newly modeled clinic. Examples of positions that need to be filled by current or new staff members are primary care physicians, social workers, psychiatrist, licensed mental health professionals, case managers, medical assistants and front desk staff. Billing and coding can be a complicated process when integrating mental health services with medical services; this process will take serious consideration and time commitment between departments within the specific healthcare system. Another aspect that needs to be addressed individually is the use of medical records and ensuring that all participants in the clinic have access to the patient’s record for collaboration purposes; electronic medical records are recommended for this. Typical

pathways for patients will also be defined during this phase; for example a patient receiving psychiatric care for an SMI will automatically be assigned a primary care physician or any patient in the primary care setting with signs of depression will be sent to meet with a psychologist.

Once preparation is complete, implementation can begin. This phase can be initiated and then elaborated on at later dates to ensure a smooth transition. Notes should be kept along the way to reference barriers and successes during the process. Evaluation will also occur during this phase to address the changing needs of the clinic. It is important to be patient when growing patient numbers and reevaluating staff needs as these numbers adjust. Sustainment is the last phase which utilizes the evaluations and makes necessary changes and improvements to keep the clinic running efficiently and smoothly. At this time the three aims will be reevaluated to see if the clinic is meeting the needs or if changes need to occur.

Challenges

As with any change in infrastructure, challenges and set backs are to be expected. Sharing medical records is a necessary component but can also cause a challenge for smaller clinics or systems that have not adopted an EHR. While there are options to collaborate on patient care without the utilization of EHR's, this is another great reason to switch to EHR's. By using technology clinicians can leave notes for upcoming appointments with different clinicians, see notes from different departments and review prescriptions from all aspects of patient care.

Another clerical challenge arises when payment and billing practices are examined during the exploration phase. With the majority of payments being fee-for-service (FFS), there is no financial assistance for providing care to complex patients (Rich, Lipson, Libersky, & Parchman, 2012). For example it is financially beneficial for a primary care office to refer patients out to specialists instead of treating them in their clinic; this is counterintuitive as it increases the overall financial burden on the healthcare system as a whole. Physician fees also do not take into affect the increased time associated with explaining care plans to patients with SMI or coordinating care between other clinicians. Patients with numerous mental and/or somatic concerns often require assistance beyond the typical eight hour week day, but FFS doesn't support overnight telephone communication or increased reimbursement for after hours or weekend care. Currently, pilot programs and new initiatives are provided funding from agents of change which offset the financial burdens listed previously. Moving forward the ACA is starting to recognize the big picture financial and patient benefit associated with integrated care

and has initiated incentive programs to encourage adoption of the integrated care model. Goals for the future would be to work with health care policy leaders to ensure practices are reimbursed adequately for the innovative services they're providing.

In contrast to financial challenges, ensuring competency among clinicians is more prevalent during the early years of implementation with hope that training and education models will adapt. Ample opportunities for training resources will need to be provided to allow current clinicians the ability to enhance their skill set with specific techniques for patients with SMI. While clinicians might have had a few patients pre-integration with SMI, they are usually unable to devote time for maintaining skills and knowledge specific to a few patients (Rich et al., 2012). This challenge has been proactively accounted for by combining training sessions into CME courses that are already a required aspect.

Stigma is a social construct barrier that was an issue pre-integration but is also anticipated to limit patient numbers in integrated care models as they are developed. Patients seeking primary care services might be resilient to mental health screenings which would be detrimental to the proposed plan of integration. On the other end of the spectrum patients with SMI who have developed a relationship with mental health clinicians or psychiatrists may also show resiliency in opening up to new primary care physicians. A truly collaborative environment will help this dynamic by giving patients the understanding that their current clinician is recommending the new plan and that all aspects of the team are working together for a common goal of patient satisfaction and positive outcomes.

CONCLUSION

While exact statistics in regards to prevalence of comorbid medical conditions in patients with SMI vary from study to study; trends can be seen to show how patients with SMI are a unique, vulnerable population with increased risk of having more severe and frequent somatic conditions when compared to the general population. Integration of mental and medical health practices has shown positive effects in pilot studies and recent implementation efforts. Positive effects include contained healthcare costs, improved patient and clinician satisfaction, increased preventative care rates and improved perception of health.

My proposed model is divided into an educational arm as well as an implementation arm to account for changes needed in both formal medical training as well as healthcare infrastructure. By starting the educational component first, the next cohort of physicians will be well versed in integrated care techniques and have an overall understanding of the model. The next step is a big leap for a lot of practices, but collaborating between mental health professionals and primary care physicians will prove to be incredibly prosperous for patient outcomes and satisfaction.

APPENDIX

APPENDIX A: Prevalence of Medical Conditions in the Population with SMI

(Janssen et al., 2015)

Overweight

	Measurement type				Study population				Overall
	Claims data (0)	Clinical measurement [43–51] (9)	Self-report [3,52,53] (3)	Other (0)	Inpatient [47,49] (2)	Outpatient [43,44,46,48,3,52,53] (7)	Community [45] (1)	Other [20,21] (2)	Total (12)
Median prevalence	n/a	29.5%	27.8%	n/a	32.7%	29.0%	41.4%	28.0%	29.0%
Mean prevalence	n/a	32.6%	28.9%	n/a	30.3%	32.2%	41.4%	28.0%	31.9%
Highest prevalence	n/a	58.0%	32.0%	n/a	25.0%	32.0%	41.4%	28.0%	58.0%
Lowest prevalence	n/a	25.0%	27.8%	n/a	32.7%	30.0%	41.4%	28.0%	25.0%

Obesity

	Measurement type				Study population				Overall
	Claims data (0)	Clinical measurement [43,44,46–52,56] (10)	Self-report [3,53–55] (4)	Other (0)	Inpatient [17,19,25] (3)	Outpatient [43,44,46,48,3,52,53,55] (8)	Community [54] (1)	Other [20,21] (2)	Total (13)
Median prevalence	n/a	42.0%	36.3%	n/a	37.0%	46.2%	37.8%	46.0%	40.6%
Mean prevalence	n/a	42.0%	36.1%	n/a	37.5%	42.3%	37.8%	40.1%	40.4%
Highest prevalence	n/a	55.0%	46.2%	n/a	41.9%	55.0%	39.2%	47.3%	55.0%
Lowest prevalence	n/a	26.0%	28.9%	n/a	34.0%	26.0%	36.3%	27.0%	26.0%

Hyperlipidemia

	Measurement type				Study population				Overall
	Claims data [56,59–64] (7)	Clinical measurement [43,65–68] (5)	Self-report [69] (1)	Other [70]	Inpatient [56,65] (2)	Outpatient [43,64,67,68,70] (5)	Community (0)	Other [59–63,66,69] (7)	Total (14)
Median prevalence	28.8%	11.7%	14.0%	26.0%	33.8%	30.0%	n/a	24.8%	26.6%
Mean prevalence	29.1%	17.5%	14.0%	26.0%	33.8%	33.9%	n/a	23.3%	27.0%
Highest prevalence	55.9%	61.0%	14.0%	26.0%	55.9%	61.0%	n/a	35.2%	61.0%
Lowest prevalence	12.3%	10.8%	14.0%	9.0%	11.7%	9.0%	n/a	10.8%	9.0%

Hypertension

	Measurement type				Study population				Overall
	Claims data [56,59–63,72,73] (8)	Clinical measurement [43,46,47,50,64,66,67,74,75,77] (10)	Self-report [55,69,76,80–82] (6)	Other [52,65,70,78,79] (5)	Inpatient [47,56,65,72–75] (7)	Outpatient [43,46,52,55,64,66,67,70,76–81] (14)	Community [82] (1)	Other [50,59–63,69] (7)	Total (29)
Median prevalence	35.3%	37.8%	24.7%	34.0%	31.7%	34.0%	47.0%	35.2%	35.0%
Mean prevalence	34.7%	40.9%	27.8%	37.9%	34.3%	37.0%	47.0%	34.3%	35.8%
Highest prevalence	61.6%	68.0%	47.0%	68.0%	61.6%	68.0%	47.0%	59.1%	68.0%

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Lowest prevalence	10.0%	14.4%	20.0%	15.9%	10.0%	22.1%	47.0%	16.5%	10.0%

Diabetes mellitus

	Measurement type				Study population				Overall
	Claims data (0)	Clinical measurement [65,70] (2)	Self-report (0)	Other [43,77,78,84] (4)	Inpatient [65] (1)	Outpatient [43,70,77,78,84] (5)	Community (0)	Other (0)	Total (6)
Median prevalence	n/a	9.2%	n/a	16.0%	6.9%	13.0%	n/a	n/a	12.5%
Mean prevalence	n/a	9.2%	n/a	19.5%	6.9%	17.9%	n/a	n/a	16.1%
Highest prevalence	n/a	11.5%	n/a	34.0%	6.9%	34.0%	n/a	n/a	34.0%
Lowest prevalence	n/a	6.9%	n/a	12.0%	6.9%	11.5%	n/a	n/a	6.9%

Coronary heart disease

	Measurement type				Study population				Overall
	Claims data [56,59–62] (5)	Clinical measurement (0)	Self-report [69,76,88] (3)	Other (0)	Inpatient [56,88] (2)	Outpatient [76] (1)	Community (0)	Other [59–62,69] (5)	Total (8)
Median prevalence	5.9%	n/a	1.0%	n/a	19.1%	1.0%	n/a	5.2%	5.4%
Mean prevalence	10.8%	n/a	12.50%	n/a	17.2%	1.0%	n/a	5.0%	7.9%
Highest prevalence	22.5%	n/a	1400.0%	n/a	22.5%	1.0%	n/a	10.6%	22.5%
Lowest prevalence	2.3%	n/a	1100.0%	n/a	8.1%	1.0%	n/a	1.0%	1.0%

Congestive heart failure

	Measurement type				Study population				Overall
	Claims data [60–62] (3)	Clinical measurement (0)	Self-report [76] (1)	Other [87] (1)	Inpatient (0)	Outpatient [76,87] (2)	Community (0)	Other [60–62] (3)	Total (5)
Median prevalence	1.5%	n/a	1.5%	12.5%	n/a	2.0%	n/a	1.5%	1.8%
Mean prevalence	2.0%	n/a	1.5%	12.5%	n/a	5.2%	n/a	2.0%	3.6%
Highest prevalence	3.2%	n/a	2.0%	12.5%	n/a	12.5%	n/a	3.2%	12.5%
Lowest prevalence	1.2%	n/a	1.0%	12.5%	n/a	1.0%	n/a	1.2%	1.0%

Cerebrovascular disease

	Measurement type				Study population				Overall
	Claims data [59–63] (5)	Clinical measurement (0)	Self-report (0)	Other (0)	Inpatient (0)	Outpatient (0)	Community (0)	Other [59–63] (5)	Total (5)
Median prevalence	2.8%	n/a	n/a	n/a	n/a	n/a	n/a	2.8%	2.8%
Mean prevalence	3.1%	n/a	n/a	n/a	n/a	n/a	n/a	3.1%	3.1%

(continued on next page)

Table 2 *(continued)*

Overweight

	Measurement type				Study population				Overall
	Claims data (0)	Clinical measurement [43–51] (9)	Self-report [3,52,53] (3)	Other (0)	Inpatient [47,49] (2)	Outpatient [43,44,46,48,3,52,53] (7)	Community [45] (1)	Other [20,21] (2)	Total (12)
Highest prevalence	7.8%	n/a	n/a	n/a	n/a	n/a	n/a	7.8%	7.8%
Lowest prevalence	1.3%	n/a	n/a	n/a	n/a	n/a	n/a	1.3%	1.3%

Overall cardiovascular disease

	Measurement type				Study population				Overall
	Claims data [56,59,63,72,86] (5)	Clinical measurement [65] (1)	Self-report [55,76,81,82] (4)	Other (0)	Inpatient [56,65] (2)	Outpatient [55,76,81,82,86] (5)	Community (0)	Other [59,63,72] (3)	Total (10)
Median prevalence	22.5%	4.8%	9.0%	n/a	20.9%	9.6%	n/a	39.5%	12.4%
Mean prevalence	29.8%	4.8%	10.5%	n/a	16.1%	10.5%	n/a	34.2%	22.7%
Highest prevalence	55.3%	4.8%	19.0%	n/a	22.5%	19.0%	n/a	55.3%	55.3%
Lowest prevalence	8.8%	4.8%	6.0%	n/a	4.8%	6.0%	n/a	8.8%	4.8%

COPD

	Measurement type				Study population				Overall
	Claims data [60–62,86] (4)	Clinical measurement (0)	Self-report [69,81] (2)	Other (0)	Inpatient (0)	Outpatient [81,86] (2)	Community (0)	Other [60–62,69] (4)	Total (6)
Median prevalence	10.7%	n/a	4.6%	n/a	n/a	6.6%	n/a	10.7%	8.9%
Mean prevalence	10.1%	n/a	4.6%	n/a	n/a	6.6%	n/a	9.1%	8.3%
Highest prevalence	12.9%	n/a	7.1%	n/a	n/a	7.1%	n/a	12.9%	12.9%
Lowest prevalence	6.1%	n/a	2.0%	n/a	n/a	6.1%	n/a	2.0%	2.0%

Kidney disease

	Measurement type				Study population				Overall
	Claims data [60–62] (3)	Clinical measurement [74] (1)	Self-report [76] (1)	Other (0)	Inpatient [74] (1)	Outpatient [76] (1)	Community (0)	Other [60–62] (3)	Total (5)
Median prevalence	1.4%	0.7%	3.4%	n/a	0.7%	3.4%	n/a	1.4%	2.3%
Mean prevalence	3.2%	0.7%	3.4%	n/a	0.7%	3.4%	n/a	3.2%	3.0%
Highest prevalence	6.9%	0.7%	3.7%	n/a	0.7%	3.7%	n/a	6.9%	6.9%
Lowest prevalence	0.8%	0.7%	3.1%	n/a	0.7%	3.1%	n/a	0.8%	0.7%

Cancer

	Measurement type				Study population				Overall
	Claims data [60,72] (2)	Clinical measurement [74] (1)	Self-report [76] (1)	Other (0)	Inpatient [74] (1)	Outpatient [76] (1)	Community (0)	Other [60,72] (2)	Total (4)
Median prevalence	2.2%	0.4%	5.2%	n/a	0.4%	5.2%	n/a	2.2%	2.5%
Mean prevalence	1.9%	0.4%	5.2%	n/a	0.4%	5.2%	n/a	1.9%	2.7%
Highest prevalence	2.8%	0.4%	5.2%	n/a	0.4%	5.2%	n/a	2.8%	5.2%
Lowest prevalence	0.6%	0.4%	5.2%	n/a	0.4%	5.2%	n/a	0.6%	0.4%

Hepatitis B

	Measurement type				Study population				Overall
	Claims data (0)	Clinical measurement [49,94,95,9,96] (5)	Self-report (0)	Other (0)	Inpatient [49,94,95] (3)	Outpatient (0)	Community (0)	Other [9,96] (2)	Total (5)
Median prevalence	n/a	20.2%	n/a	n/a	26.7%	n/a	n/a	18.9%	20.2%
Mean prevalence	n/a	25.1%	n/a	n/a	30.3%	n/a	n/a	19.9%	25.1%
Highest prevalence	n/a	49.5%	n/a	n/a	49.5%	n/a	n/a	29.3%	49.5%
Lowest prevalence	n/a	12.5%	n/a	n/a	18.3%	n/a	n/a	12.5%	12.5%

Hepatitis C

	Measurement type				Study population				Overall
	Claims data [60,62,86,101,102] (5)	Clinical measurement [49,94,9,96–100] (8)	Self-report [69] (1)	Other (0)	Inpatient [49,94] (2)	Outpatient [86] (1)	Community (0)	Other [60,62,69,9,96–102] (11)	Total (14)
Median prevalence	7.1%	17.2%	4.0%	n/a	20.0%	1.9%	n/a	10.6%	12.3%
Mean prevalence	8.0%	16.5%	4.0%	n/a	20.0%	1.9%	n/a	12.2%	12.5%
Highest prevalence	16.5%	25.4%	4.0%	n/a	21.0%	1.9%	n/a	25.4%	25.4%
Lowest prevalence	0.7%	7.1%	4.0%	n/a	18.9%	1.9%	n/a	0.7%	0.7%

HIV

	Measurement type				Study population				Overall
	Claims data [60,62,86,101,106–108] (7)	Clinical measurement [74,95,9] (3)	Self-report [69,105] (2)	Other (0)	Inpatient [74,95] (2)	Outpatient [69,86,105,106] (4)	Community (0)	Other [60,62,9,101,107,108] (6)	Total (12)
Median prevalence	1.4%	2.7%	1.5%	n/a	3.8%	1.9%	n/a	1.6%	1.8%
Mean prevalence	1.4%	3.4%	1.5%	n/a	3.8%	1.9%	n/a	1.8%	2.1%
Highest prevalence	2.8%	5.0%	2.0%	n/a	4.8%	2.8%	n/a	5.0%	5.0%
Lowest prevalence	0.1%	1.7%	1.0%	n/a	2.7%	1.0%	n/a	0.1%	0.1%

APPENDIX B: Attitudes About Behavioral Health Consultants Survey (Torrence et al., 2014)

EVALUATING BEHAVIORAL HEALTH SERVICES

This brief measure is designed to assess the attitudes and perceptions of our integrated model of care at Peak Vista. The term Behavioral Health Consultants (BHCs) refers to licensed non-prescribing BH staff and supervised graduate students.

Please indicate the extent to which you agree with the following statements:	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**N/A**
1. **Using BHCs improves my efficiency as a healthcare provider.**						
2. Using BHCs improves overall patient care.						
3. BHCs effectively help patients address their *mental health* problems.						
4. BHCs effectively help patients address their *physical health* problems.						
5. Working with BHCs has increased my comfort in discussing mental health issues with my patients.						
6. BHCs are an important part of my practice.						

7. On average, how often do you currently refer to or consult with BHCs (on a weekly basis)?

☐ 0-3 times/week ☐ 4-6 times/week ☐ 6+ times/week ☐ Never

8. Type of provider:

☐ Physician ☐ Mid-level

☐ Full-time PCP ☐ Part-time PCP ☐ Per Diem PCP

9. Please indicate the Health Center(s) at which you work:

☐ DDHC ☐ Family Health Myron Stratton ☐ Senior Health North

☐ Family Health Divide ☐ Family Health Union ☐ Senior Health South

☐ Family Health Fountain ☐ Homeless ☐ Women's Health Center

☐ Family Health Internat'l Cir. ☐ Pediatric Health Center

10. How long have you worked at Peak Vista?

☐ 0-2 years ☐ 3-6 years ☐ 7-10 years ☐ 10+ years

11. Please indicate your gender: _____ Male _____ Female _____ Other (please specify)

12. Please indicate your age: _____ years

13. Please indicate your race/ethnicity (select as many as apply):

☐ White/Caucasian ☐ Black/African American ☐ Hispanic ☐ Asian/Pacific Islander

☐ American Indian ☐ Other/Multiracial (please specify) ____________________

14. Additional comments or opinions about behavioral health in integrated care:

Figure 1. Attitudes about behavioral health consultants survey.

APPENDIX C: GROW Pathway Worksheet (Ratzliff et al., 2015)

<table>
<tr><td colspan="4">Goal: Which populations of patients are we targeting?</td></tr>
<tr><td colspan="2"></td><td colspan="2">Do we serve this population now? How do we want to serve this population better?</td></tr>
<tr><td colspan="2">Patients in crisis and distress</td><td colspan="2"></td></tr>
<tr><td colspan="2">Patients with common chronic mental illnesses such as depression and anxiety</td><td colspan="2"></td></tr>
<tr><td colspan="2">Patients needing support to manage serious mental illness</td><td colspan="2"></td></tr>
<tr><td colspan="2">Other populations</td><td colspan="2"></td></tr>
<tr><td colspan="4">Resources: What are the resources available to us? What challenges with resources need to be addressed?</td></tr>
<tr><td colspan="2"></td><td colspan="2">What resources does our organization have?</td></tr>
<tr><td colspan="2">Geography</td><td colspan="2"></td></tr>
<tr><td colspan="2">Physical space</td><td colspan="2"></td></tr>
<tr><td colspan="2">Support of leadership</td><td colspan="2"></td></tr>
<tr><td colspan="2">Care team & workforce development</td><td colspan="2"></td></tr>
<tr><td colspan="2">Shared workflows</td><td colspan="2"></td></tr>
<tr><td colspan="2">Available technology/ HIT</td><td colspan="2"></td></tr>
<tr><td colspan="2">Financial Resources</td><td colspan="2"></td></tr>
<tr><td colspan="4">Options: What capacities do we have now and how can we create capacity to integrate behavioral health?</td></tr>
<tr><td colspan="2"></td><td>Do we do this?</td><td>How can we do this?</td></tr>
<tr><td rowspan="2">Access</td><td>Facilitated Referral</td><td></td><td></td></tr>
<tr><td>On-site Behavioral Health Provider</td><td></td><td></td></tr>
<tr><td rowspan="2">Accountability</td><td>Measurement-Based Treatment to Target for Individuals</td><td></td><td></td></tr>
<tr><td>Commitment to Population Outcome Improvement</td><td></td><td></td></tr>
<tr><td colspan="4">Workflow: What changes will need to be in place for us to deliver integrated behavioral health?</td></tr>
<tr><td colspan="2"></td><td colspan="2">How can we do this?</td></tr>
<tr><td colspan="2">Do staff need to be hired? What types of staff? Do existing or new staff need to be trained?</td><td colspan="2"></td></tr>
<tr><td colspan="2">What facilities, HIT, and other resources are required to implement the integrated workflow?</td><td colspan="2"></td></tr>
<tr><td colspan="2">What internal communication materials and protocols, and clinic-specific guidelines and protocols for psychiatric emergencies do we need?</td><td colspan="2"></td></tr>
<tr><td colspan="2">How will our physical space foster collaboration? Should providers share a pod?</td><td colspan="2"></td></tr>
<tr><td colspan="2">What materials do we need to introduce the new care delivery pathway to patients and organization clinicians and staff?</td><td colspan="2"></td></tr>
<tr><td colspan="2">How will we schedule visits? Will we schedule follow-ups interspersed with open access appointments to facilitate time for just-in-time consultations and warm handoffs?</td><td colspan="2"></td></tr>
</table>

LIST OF JOURNAL ABBREVIATIONS

AHRQ	Agency for Healthcare Research and Quality
JABFM	JABFM: The Journal of the American Board of Family Medicine
JAMA	JAMA: The Journal of the American Medical Association

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