EFFECT OF A COLLEGIATE INTEGRATED PRIMARY AND BEHAVIORAL HEALTHCARE PROGRAM ON RECOVERY CURVES AMONG STUDENTS WITH SEVERE MENTAL HEALTH SYMPTOMS

A Dissertation in
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by
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ABSTRACT

Integrated Primary and Behavioral Healthcare (IPBH) programs have been investigated extensively in community settings, but few studies have included the effect of such programs on college campuses. Studies that have examined the effects of IPBH in community settings have indicated that integrated care is more effective than primary care interventions alone. No studies were found examining the clinical outcome of this type of intervention in a collegiate IPBH program. The recovery curves of 267 students with severe mental health symptoms were examined in the current study using Growth Curve Modeling. Pre and post changes were also examined using repeated measures of ANOVA. Student subgroups were identified as (1) counseling-only, (2) counseling and primary care, and (3) counseling, primary care, and psychiatric care. These groups were compared to each other for differences in speed of recovery and pre to post treatment changes. Results indicated that treatment groups showed similar pre and post changes. Comparisons of treatment groups based on the speed of recovery resulted in students in the counseling-only group recovering faster than other two groups although this difference accounted for only 1.3% of the variance. These results are discussed considering the existing literature and the implications for future collegiate IPBH research and clinical practice for counselors, primary care staff, and psychiatrists.
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Chapter 1

INTRODUCTION

Large national surveys consistently indicate that 30–50% of college students have a mental health disorder, and these conditions are among the top health concerns (Blanco et al., 2008; Eisenberg, Hunt, Speer, & Zivin, 2011; Turner, & Keller, 2015). Studies reported an increasing trend in the severity of symptoms and the number of students taking psychotropic medications (Center for Collegiate Mental Health [CCMH], 2018, Gallagher, 2014; Raghavan, 2014). College counseling services in the US experience yearly increases of up to 15% in the demand for treatment, and students are increasingly put on waitlists (Mistler, Reetz, Krylowicz, & Barr, 2012). As a result, colleges and universities across the US need to show efforts to meet increased demand and search for the best practices in mental health service delivery to utilize scarce resources more effectively and efficiently.

Studies have shown that mental health problems can negatively influence academic performance. Douce and Keeling (2014) asserted that the negative effects of mental health issues have implications on student learning and development. The annual survey of the American College Health Association (ACHA, 2018) showed that 22% and 14% of students’ academic performance was affected by anxiety and depression, respectively. In the same study, 30% of students indicated that stress negatively influenced academic performance.

College students experiencing severe mental illness (SMI) may encounter more serious problems that can impact their academic progress such as frequent hospitalizations, suicidal ideations, and dropouts (Blanco et al., 2008; Zivin, Eisenberg, Gollust, & Golberstein, 2009). A recent report highlighted that 10% of student clients receiving counseling services reported
having been hospitalized at least once due to a mental health issue (CCMH, 2018). Previously, Benton et al. (2013) reported that concerns about depression had doubled while students presenting with suicidal thoughts had tripled over a 13-year period. Consequently, suicide has become one of the leading causes of death among college students (Turner, Leno, & Keller, 2013).

Researchers have expressed concerns over traditional models for providing mental health services given the increasing trend in the severity of mental health issues (Downs, Alderman, Schneiber, & Swerdlow, 2016; Pratt, Scott, DeBerard, Davis, & Wheeler, 2012; Turner et al., 2018). A conventional approach in providing mental health services is matched care where clients are referred to a certain health provider based on their personal characteristics and preferences (van Straten, Hill, Richards, & Cuijpers, 2015). This type of service delivery is detrimental to client care in many ways. First, it does not include a reliable monitoring system whether the service clients receive is beneficial to them (Ho, Yeung, Ng, & Chan, 2016). Second, these traditional approaches to mental health care often offer fragmented and insufficient treatments to clients with SMI (The Substance Abuse and Mental Health Services Administration [SAMHSA], 2018). As a result, these individuals are more vulnerable to long-term disabilities and premature deaths (Zalaquett, & Haynes-Thoby, 2020).

Murphy and Martin (2004) summarized some suggestions in the literature in response to the increasing trend in the volume and severity of mental health issues. Among these suggestions are (1) establishing emergency procedures that are not a part of a traditional intake system, and (2) providing staff training on assessment and referral procedures. Many authors (Pratt, Scott, DeBerard, Davis, & Wheeler, 2012; Turner et al., 2018) also suggested that college campuses
should develop integrated student health programs that merge behavioral and primary health care services.

The integrated behavioral and primary health care (IPBH) model relies on the contribution of behavioral and medical professionals on a shared caseload (SAMHSA, n.d.). This model is increasingly implemented to meet the needs of individuals with mental and physical disorders (Schmit, Watson, & Fernandez, 2018). IPBH care teams usually consist of primary care physicians, nurses, physician assistants, mental health counselors and social workers, responsible for developing and implementing treatment plans for a shared caseload (Heath, Wise, & Reynolds, 2013).

**Statement of the Problem**

It is estimated that only 13 percent of college counseling centers are integrated with primary care at some level across the US (CCMH, 2018). To meet the current need for the increasing severity of mental health problems, the American College Health Association (ACHA; 2010) promotes the integration of behavioral health and primary care services to provide a wellness-based holistic care to campus communities. A wealth of research supports the integration of behavioral and primary care services as a way to improve clinical outcomes and access to care in community settings (Butler et al., 2008; Collins, Levis Hewson, Munger, & Wade, 2010; Kwan, & Nease, 2013; Padwa et al., 2016; Peek, Ferguson, Bergeron, Maltby, & Chin, 2014; Wray, Szymanski, Kearney, & McCarthy, 2012), but little is known about the treatment outcomes of integrated health services on college campuses (Turner et al., 2018).

Researchers in collegiate mental health have shown an increasing interest regarding IPBH models on college campuses (Pratt, Scott DeBerard, Davis, & Wheeler, 2012; Turner et al., 2018).
Previous clinical trials (Katon et al., 1995; Simon, Ludman, Tutty, Operkalski, & Korff, 2004; Unützer, 2002) and meta-analyses (e.g., Archer et al., 2012; Lenz, Dell’Aquila, & Balkin, 2018) generated results regarding the benefits of IPBH approach in community settings. The fact that the majority of previous studies were conducted in settings other than college campuses highlights the necessity of studying IPBH programs on college campuses to generate more reliable and generalizable results for college population.

Understanding the treatment outcomes related to the IPBH models for students experiencing severe mental health symptoms and its implications on college campuses requires the inclusion of the biopsychosocial theory (Engels, 1979). Interprofessional collaboration and referral systems among health professionals to provide coordinated services to students with severe mental health issues in IPBH models is emphasized in biopsychosocial framework (Lenz, Dell’Aquila, & Balkin, 2018). Biopsychosocial framework provides a guideline for this study to articulate how various health professionals should work together within an IPBH care model to improve treatment outcomes. The World Health Organization (WHO, 2018) states that individuals with SMI die 10 to 20 years earlier than those without a mental illness due to poor access to healthcare. Traditional behavioral health programs in which behavioral and medical services are not integrated often overlook poor physical health conditions particularly for those from diverse cultural backgrounds (SAMHSA, 2018). The IPBH model would be one beneficial approach to address poor physical and mental health conditions simultaneously through interprofessional collaboration on college campuses to improve client satisfaction and treatment outcome in healthcare.
Research Questions

The purpose of this study was to investigate the effectiveness and efficiency of different levels of an IPBH program in a routine care setting on a college campus using counseling session-by-session treatment outcome measures on the Global Mental Health Scale (GMHS) of the Behavioral Health Assessment – 20 (BHM-20; Kopta, & Lowry, 2002). The following research questions guided the research of this dissertation thesis:

**RQ1.** Is the counseling and primary care intervention more effective at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

**RQ2.** Is the counseling and primary care intervention more efficient at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

**RQ3.** Does the addition of psychiatric care to the counseling and primary care intervention improve global mental health functioning among college students experiencing severe mental health symptoms?

Significance of the study

Despite the illustrated need for IPBH models within the college setting, research investigating this topic is sparse (Pratt, Scott DeBerard, Davis, & Wheeler, 2012; Turner et al., 2018). This dissertation study analyzes data from an integrated college health center. Considering the fact that IPBH models are both endorsed by SAMHSA and ACHA, and a wealth of research supports these models, examining longitudinal data of an integrated student health care program in a routine care setting on a college campus was a meaningful addition to the existing literature.
The rights of individuals with SMI is a social justice issue and has received increased attention in over the past decades (Callard et al., 2012). Individuals with SMI have significant barriers in accessing the healthcare services (Clement et al., 2015) resulting in more severe physical (e.g. cardiovascular disease, diabetes; Nardone, Snyder, & Paradise, 2014) and mental health conditions (e.g. illicit drug and alcohol use; Brown, Bennett, Li, & Bellack, 2011). IPBH is a client-centered approach (Butler et al., 2008) which increases access to needed physical and mental health care (Szymanski, Bohnert, Zivin, & McCarthy, 2013). Previous research also demonstrated that client satisfaction improves when they receive primary and behavioral care services under one health program (Kern, Dhopieshwarke, Edwards, & Kaushal, 2013). Increased accessibility to and satisfaction of integrated health programs would ease the empowerment of these individuals and provide them with the opportunity to overcome those barriers. Many authors in counseling literature (e.g. Lenz, Dell’Aquila, & Balkin, 2018; Schmit, Watson, & Fernandez, 2017) have proposed IPBH as one beneficial model to combat this social justice problem.

The outcome of this study should help counselors, primary care professionals, administrators, and other staff on college campuses develop more effective mental health care programs that address the increasing trend in the volume and severity of mental health issues among college populations. Previous research suggests that IPBH models are superior to stand-alone primary care interventions in randomized clinical trials (RCT; Archer et al., 2012). Early evidence from these RCTs and observations outlined in other research findings on college campuses (e.g. Westheimer, Steinley-Bumgarner, & Brownson, 2008) suggest that the IPBH model is viable, while more systematic evaluation is needed. It is imperative to investigate
clinical outcomes of the different levels of care within established collegiate integrated primary and behavioral health programs on college campuses to see if similar models can be implemented elsewhere (Turner et al., 2018). This study investigated how IPBH approach impact client recovery curves and treatment outcomes using secondary data in a routine care setting on a college campus.

**Limitations**

Several factors limited the ability to infer and generalize from the study’s findings. Because an ex post facto research design was used, random assignments to the treatment groups were not possible. Therefore, it was impossible to conclude with full confidence that the independent variable was the cause of the significant relationships rather than some other spurious variable.

It is impossible to choose the experimental groups in ex-post facto designs since the treatments have already occurred (Salkind, 2010). Selection of the participants was solely based on the severity of their initial scores on the BHM-20 assessment. SMI in this study was operationalized based on the cut-off scores on the GMHS of the BHM-20 (Kopta, & Lowry, 2002). Participants’ mental health diagnoses based on DSM-5 or ICD-10 were unknown. These individuals may have had co-occurring disorders, which may not be reflective on the psychometric assessment.

Response bias is the tendency of a person to answer questions on a survey untruthfully or misleadingly (Furnham, 1986). Response bias was particularly an issue in this study because students had to complete BHM-20 assessment at the kiosks in order to check in for their counseling appointment. Social desirability in responding questions or late arrivals to the
counseling appointments may have created the tendency to answer questions untruthfully or misleadingly. Their response may also have been inaccurate because participants may not have understood the questions or they may have confused by the manner in which they were asked, their response may be inaccurate.

Definitions of Terms

Integrated Primary and Behavioral Care (IPBH)

The IPBH model integrates primary care with behavioral care under one program to provide a holistic client care. IPBH has been defined in terms of different elements such as shared client records, formal referral mechanisms, treatment algorithms, and level of administrative integration and interprofessional relationships (SAMHSA, n.d.).

Matched Care

Matched care, also known as stratified care, is a traditional model of delivering health services that determines the type of therapeutic intervention and provider during initial evaluation based on individual preferences and characteristics (van Straten, Hill, Richards, & Cuijpers, 2015). Clients may receive too much treatment with no additional therapeutic gain in this model (Lovell & Richards, 2000).

Severe Mental Illness (SMI)

SMI is a mental health condition resulting in functional impairment which substantially interferes with or limits one or more major life activities currently or within the past year (SAMHSA, n.d.).
Therapeutic effectiveness

Therapeutic effectiveness refers to the gain(s) after an intervention of any type, which is typically measured through pre-post research designs in counseling outcome studies.

Therapeutic efficiency

Therapeutic efficiency is a relatively newer phenomenon than therapeutic effectiveness. Albert Ellis is one of the early scholars who described the term efficiency and its significance in relation to therapeutic effectiveness. Ellis (1980) asserted that therapeutic efficiency in psychotherapy refers to the amount of time and resources normally spent by therapists and clients in order to achieve effective and long-lasting results. According to Ellis, efficient psychotherapy help clients achieve their therapeutic goals in a shorter period of time and in a more cost-effective way. Numerous contemporary studies investigating therapeutic outcomes in psychotherapy have included efficiency as a factor for therapeutic success along with effectiveness which is measured through growth-curve modeling (cf Banham, and Schweitzer, 2016; Kraus et al., 2016; Okiishi et al., 2003; Okiishi et al., 2006).
Chapter 2
REVIEW OF THE LITERATURE

The Biopsychosocial theory was used as a conceptual base to examine factors related to therapeutic process and outcome in the Integrated Primary and Behavioral Healthcare (IPBH). Using this theory to examine factors related to therapeutic outcome might help understand why integrated care may or may not be a beneficial model to address contemporary collegiate mental health needs. In this chapter, a review of literature relevant to the historical development of the integrated care movement with its philosophical underpinnings, empirical research on the effect of IPBH models on the treatment outcomes, common factors contributing to effective counseling, and various counseling models in college settings are included. A review of the Biopsychosocial theory was also presented.

Integrated Primary and Behavioral Healthcare

Historical Background

The body-mind dualism or Cartesian dualism is an ontological standpoint of human nature based on the philosophical scripts of Rene Descartes who lived between 1596-1650 (Skirry, 2005). Descartes believed that mind and body exist independently and are distinct kinds of substances. Body-mind dualism helped medical science gain acceleration since the Renaissance because Descartes provided a resolution to the common Christian belief that the body and soul are integrated, and therefore not open to scientific inquiry (Mehta, 2011). Through the mind-body separation, Descartes helped body become a subject for scientific inquiries which had helped the medical sciences find cures for illnesses and increase human life expectancy until the modern times. This body-mind dualism caused a disconnection that is difficult to overcome
between the scientific disciplines studying disease such as Psychology and Psychiatry (Thibaut, 2018). Body-mind separation has increasingly been challenged by the modern science since the 19th century to resolve the poor communication between the scientific fields studying human health.

Accumulation of the evidence against the body/mind dualism and biomedical model in the 20th century paved the way for the emergence of a new paradigm in the medical science. George L. Engel, an American Internist and Psychiatrist, became an important figure in the late 20th century criticizing the dualist nature of the medical science despite the scientific evidence against it (Borrell-Carrió, Suchman, & Epstein, 2004). Engel believed that health service providers must aim to understand the causes of an illness with its social, psychological and biological dimensions (Engel, 1977). Engel’s research in psychosomatics suggested a more integrative approach in health care as a result of the scientific evidence that adverse emotional experience affects the whole body (Borrell-Carrió, Suchman, & Epstein, 2004).

Referring to health care historians, Reamer (2018) asserted that the first integrated health program was the Gouverneur Health Program that was established in the 1970s in New York City, although the model did not fully develop until the 1990s. Some authors (Collins, Hewson, Munger & Wade, 2010) suggested that Veterans Health Administration and some federally qualified health programs such as the Cherokee Health Systems in East Tennessee established the first examples of integrated care settings in the U. S.

The Academy for Integrating Behavioral Health and Primary Care was founded by the Agency for Healthcare Research and Quality (AHRQ) in 1999 to “respond to the recognized need for a national resource and coordinating center for those interested in behavioral health and
primary care integration” (U.S. Department of Health and Human Services, 2018). The AHRQ holds a belief that integrated care system would help achieve the “Triple Aim” (Berwick, Nolan, & Whittington 2008): Improved experience of care, improved health of populations, and reduced per capita costs of health care. Over the past 2 decades, the U.S. military and the Health Resources and Services Administration (HRSA) endorsed the integrated care approach as a governmental agency while some private health care organizations such as Health Partners in Minneapolis and Sharp Health in San Diego led the healthcare field in the integration efforts (Reamer, 2018).

Before the presidential elections in 2008, one of the key civic organizations in health care, the Commonwealth Foundation, issued a proposed agenda for the next president to improve healthcare performance in the United States. In this report proposed by distinguished academic and professional leaders in the health care field, financial incentives are suggested to support the growth of integrated care emphasizing the significance of the integrated medical record, where all providers in the integrated care team are able to access the records of a particular person (Commonwealth Fund Commission on a High-Performance Health System, 2007). In an earlier report released in 2006 by the same commission (Cantor et al. 2007), it was illustrated that the United States ranks thirty-first among nations on life expectancy and thirty-sixth on infant mortality even though U.S. health care expenditures are much higher than those of other developed countries. Therefore, the emphasized importance of the integrated health systems for the future federal health administration policies in the proposed agenda for the next president was notable.
**IPBH Models**

Over the past three decades, different models for the integration of primary care and behavioral health have been proposed. Earlier in the literature, Doherty (1995) suggested a model based on the level of professional communication between primary and behavioral care. In this model, there were five categories of integration: minimal, basic at a distance, basic on-site, close partly integrated, and close fully integrated. Blount (2003) simplified the model based on the level of communication and defined an equivalent scheme that has three categories of integration: coordinated, co-located, and integrated. He described the coordinated level as having a regular referral system among different specialists while he identified integrated level as having a collaborative team with a shared caseload.

Drawing upon the previous frameworks in the integrated care literature (see Doherty, 1995; Blount, 2003), Heath et al., (2013) developed a six-level integration model where each level is differentiated based on communication, physical proximity, and practice change. Substance Abuse and Mental Health Services Administration (SAMHSA) endorsed this enhanced classification system as a main road map for the health organizations in their efforts to integrate physical and behavioral care services.

Coordinated care (off-site)

*Level 1: Minimal collaboration*

- Patients are referred to a provider at another practice site, and providers have minimal communication.

*Level 2: Basic collaboration*

- Providers at separate sites periodically communicate about shared patients.
Co-located care (on-site)

Level 3: Basic collaboration on-site

• Providers share the same facility but maintain separate cultures and develop separate treatment plans for patients.

Level 4: Close collaboration on-site

• Providers share some system integration due to co-location

Integrated care

Level 5: Close collaboration approaching an integrated practice

• Providers develop and implement collaborative treatment planning for shared patients but not for other patients.

Level 6: Full collaboration in a merged integrated practice for all patients

• Providers develop and implement collaborative treatment planning for all patients.

The National Council for Community Behavioral Healthcare (NCCBH) developed another framework – the Four Quadrant Model - for the integration of primary care and behavioral health for different populations based their needs of health care (Mauer, 2009). Mauer asserted that the delivery of services should be based upon the needs of the individual, personal choice and the specifics of the community and collaboration. An outline of the model Mauer (2009) described in her report prepared under the auspices of the NCCBH is as follow:

• Quadrant I: Low mental health (MH) - low physical (PH) needs

• Quadrant II: High MH-low PH needs

• Quadrant III: Low MH- high PH needs

• Quadrant IV: High MH-high PH needs
The Four Quadrant Model differs from the other integration models in that the framework is determined by the specific health care needs of populations. Therefore, it was not designed to help health care settings evaluate their degree of integration but help them to identify the populations they serve. The Four Quadrant Model of integration has also been endorsed by the Center for Integrated Health Solutions (CIHS) that is funded jointly by the SAMHSA and the Health Resources and Services Administration.

**Empirical Research on the IPBH Models**

IPBH models are against the notion that body and mind are separated and should not be treated as such in health care practice. The paradigm suggests a comprehensive treatment approach that takes care of body and mind simultaneously through the interprofessional collaboration. Authors of a comprehensive meta-analysis comparing the effectiveness of IPBH models to treatment-as-usual (TAU) with anxiety and depression found small to medium effect sizes (Archer et al. 2012). TAU is defined as a comparison condition that received a previously implemented intervention, which is medication management only within the context of primary care. In the clinical trials to test the efficacy of IPBH, experimental conditions received the new treatment component, which is counseling in an integrated fashion. Integrated care is provided in a variety of different settings with varying degrees of collaboration in different programs. For instance, Improving Mood-Promoting Access to Collaborative Treatment (IMPACT; Unützer et al., 2002) is a prominent example of an IPBH approach as a superior treatment for depression compared to treatment as usual (TAU).

Unützer and his colleagues (2002) assessed the effectiveness of the IMPACT program for late life depression in a randomized clinical trial among 1801 primary care patients aged 60 years
or older with major depression disorder (17%), dysthymic disorder (30%), or both (53%).

Patients were randomly assigned to TAU and the IMPACT program which includes 12-month access to a behavioral care manager who provides education and/or psychotherapy. Behavioral Care Managers in this study were either a psychologist or nurse practitioner who were trained for the study as a depression clinical manager (DCM) under the supervision of a psychiatrist. The treatment group had a 50% or greater reduction in depressive symptoms in comparison to 19% reduction in TAU group after 12-month intervention. Another study with older adults yielded similar results. Outcome differences observed between TAU and treatment groups at 12 months with a mean Patient Health Questionnaire -9 (PHQ-9) score with IPBH, 5.93 versus with TAU, 7.25 (mean difference, −1.33; 95% CI, −0.55 to -2.10; Gilbody et al., 2017). In a similar randomized clinical trial in the United Kingdom (Richards et al., 2013), almost identical results for the treatment of depression among adults were identified. 581 adults who met ICD-10 criteria for depression were assessed after a 12-month of intervention. The treatment group showed significantly lower level of depression based on PHQ-9 scores (mean difference -1.33; 95% CI -0.35 to -2.31) while Anxiety did not differ between TAU and treatment groups based on Generalized Anxiety Disorder -7 (GAD-7). IPBH is also evaluated among adolescents with depression in a randomized trial with blinded outcome assessment (Richardson et al., 2014). In this study, adolescents (aged 13-17 years) who screened positive for depression and/or met criteria for major depression were recruited for a 12-month IPBH intervention. The intervention in this study was adapted from the IMPACT program. Brief Cognitive Behavioral Therapy was delivered by the master’s level clinicians with 1 to 2-week follow-ups. IPBH teams which include DCM, psychiatrist, psychologist, and pediatrician met every week. Follow-up intervals
reduced to every month after participants exhibited a clinically significant improvement based on PHQ-9 score. Adolescents in the intervention showed greater reduction in the Child Depression Rating Scale–Revised than TAU group whereas both groups showed similar improvement on the Columbia Impairment Scale scores.

Muntingh and her colleagues (2016) reviewed seven studies of IPBH interventions for anxiety disorders in a meta-analysis and concluded that IPBH models are superior TAU with small effect size ($SMD = 0.35$ 95 % CI 0.14–0.56) for all anxiety disorders and moderate effect size ($SMD = 0.59$, 95 % CI 0.41–0.78) for panic disorder. In another meta-analysis completed by Lenz, Dell’Aquila, and Balkin (2018), researchers evaluated 36 RCTs and found that IPBH was superior to TAU at discharge ($g = -0.38$ to -0.24; $k = 3$). They also found that number of treatment team providers and number of behavioral health sessions are strong predictors in the success of the treatment.

The IPBH models are also evaluated through quasi-experimental designs. In one recent study, researchers examined the treatment outcomes of 196 persons diagnosed with Severe Mental Illness receiving either integrated care or TAU over a 12-month period (Schmit, Watson, & Fernandez, 2018). They found that IPBH group showed 24-times greater improvement than persons who received primary care services only. These authors emphasized the value of evaluating outcome data in IPBH in order to help clients make an informed decision with regards to the different treatment models. They also suggested that counselors can develop partnerships among different health providers in their community if they are unable to provide services under a formal IPBH team.
Factors influencing the treatment outcomes in IPBH models

The IPBH model has various dimensions, each of which has a contribution to the treatment outcomes. However, there is not sufficient empirical evidence for the unique contribution of each factor, although some studies investigated those unique contributions through meta-analytical studies (Vanderlip et al., 2016).

Different Levels of Care or interventions. Many authors (Hedrick et al., 2003; Muntingh et al., 2016; Von Korff, & Tiemens, 2000) asserted that level of care is a very significant variable in IPBH paradigm that affects the treatment outcomes. IPBH may include different levels or steps based on the severity of presenting issues. For instance, Raney (2015a) indicated that psychiatrists in the integrated teams typically provide consultations to other team members (e.g. nurses, counselors) for their caseload. However, psychiatrists can also provide direct services for clients with more complex mental health issues. Therefore, some clients may step up to receiving direct services from a psychiatrist in addition to the services they receive from behavioral case managers and primary care staff. These additional steps in the intervention constitute an important variable that creates various treatment groups or levels which would be subject to empirical investigation.

Psychiatric care. Studies found that psychiatric care correlates with improved treatment outcomes (Bower et al. 2006). Psychiatric care in integrated health teams is particularly important for team members because psychiatrists are both trained in behavioral and medical sciences (Vanderlip et al., 2016). They know how to use differential diagnosis, oversee, and suggest changes to care plans which helps coordinate the diverse spectrum of interventions.
**Expertise of Behavioral Case Manager.** Roy-Byrne (2016) asserted that most interventions in integrated care research used non-mental health professionals as behavioral care managers (such as nurses) which would produce less effective therapeutic outcomes. Employing specialists in psychotherapy as a part of collaborative team such as Clinical Mental Health Counselors would help increase the contribution of behavioral interventions in the overall outcome. Therefore, counselors with high level of competency who provide evidence-based counseling interventions would help enhance therapeutic outcomes.

**Severity of Clients’ Presenting Issues.** Vanderlip et al. (2016) asserted that IPBH does not aim to assign clients to random appointments with specialists, but rather provide services based on their presenting issues. Clients with less complex issues are managed through less intensive interventions (e.g. brief psychotherapy). The intervention can be intensified for difficult-to-treat mental health issues. Therefore, the severity of presenting issues appears to be another significant variable in making clinical decisions for the integrated care team and subsequently influence the therapeutic outcome.

**Primary Care Provider’s mental health experience.** Evidence from meta-analyses indicated that nurse practitioners who have higher skill sets in working with mental health populations (i.e. psychiatric nurse) produce better treatment outcomes than nurses with other specialties (Gilbody, Bower, & Fletcher 2006; Thota et al. 2012).

**Combined therapy (Medication and Counseling).** Another meta-analysis suggested that the effects of pharmacotherapy and those of psychotherapy are largely independent from each other in the treatment of major depression, panic disorder, and obsessive-compulsive
disorder, with both contributing about equally to the effects of combined treatment (Cuijpers et al., 2014). Therefore, the absence of medication or counseling impacts the therapeutic outcome.

**Physical proximity of integrated team members.** The physical proximity of the team members is another concern in the literature that appears to be the least important variable in determining the therapeutic outcomes. Many authors asserted that IPBH is effective regardless of the physical proximity of the integrated care team members whether they are co-located or support one another remotely (Simon et al. 2011; Fortney et al. 2007; Fortney et al. 2013; Dietrich et al. 2004; Fortney et al. 2015).

**Factors Contributing to Clinical Outcomes in Counseling**

Counseling outcomes within the IPBH framework are not immune from the factors contributing to the clinical outcomes in traditional counseling environments in which primary and behavioral care are separate. These factors also need to be taken into consideration in determining the effect of IPBH interventions.

**Theoretical Orientation.** Scholarly interest in comparing different schools of counseling and psychotherapy started in 1970s. Early studies (e.g. Bergin, & Lambert, 1978; Beutler, 1979; Meltzoff, & Kornreich, 1970) suggested that no particular treatment is superior to one another. Although these early studies were not methodologically sound, contemporary meta-analyses that used more advanced statistical techniques yielded similar results (Lambert, 2013). In one of these meta-analyses, Wampold et al. (1997) compared multiple treatment modalities and included only “bona fide” treatments that were delivered by trained providers. They concluded that there were no differences in the therapeutic outcome based on the treatment models. Recent therapeutic outcome studies (e.g. Okiishi et al., 2003, 2006; Banham, & Schweitzer, 2016)
consistently found that theoretical orientation of mental health providers is not a significant predictor in the therapeutic outcome.

Therapist Effect. Therapist effect refers to the variance between mental health providers suggesting that some providers outperform others (Lambert, 2013). Crits-Christoph and Mintz (1991) estimated that therapist effect is accounted for 9 percent of the therapeutic outcome on average, ranging from 0 to 49%. In more recent studies, therapist effect is examined through the analysis of data from routine care settings (e.g. Banham, & Sweitzer, 2016; Blatt, Sanislow, Zuroff, & Pilkonis, 1996; Okiishi et al., 2003). These studies were consistent in their finding that some mental health providers outperform others regardless of their years of experience, theoretical orientation, and gender.

Scholars were interested in examining the mechanism behind therapist effect due to the significant outcome by provider variability. Anderson et al. (2009) investigated the role of Facilitative Interpersonal Skills (FIS) among providers and found high relationship between the FIS ratings of providers and client therapeutic outcome. This finding provided an alternative explanation to the therapist effect although more studies need to be done to establish a causal relationship between FIS and the performance of mental health providers.

Common Factors. Common factors refer to the variables that are essential to any counseling intervention such as therapeutic alliance, empathy, goal consensus and collaboration, positive regard and affirmation, mastery, congruence/genuineness, mentalization and emotional experience. Research suggests that common factors play an important role in evidence-based interventions in contemporary counseling practice and correlate with improved treatment outcomes (Fisher et al., 2016). Many authors (e.g. Lambert, 2013; Nahum, Alfonso,
Sonmez, 2019; Wampold, 2015) suggest that the effectiveness of different counseling interventions may rely more on common factors rather than on differences of theoretical orientation and techniques. According to Lambert (2013), 30% of variance in counseling outcomes is related to common factors.

**Client.** Bergin and Garfield (1994) asserted that “clients are not inert objects on whom techniques are administered. They are not dependent variables upon whom independent variables operate” (pp. 826). These authors emphasized that client variability is the most active agent in the therapeutic change. It is estimated that client variable, which refers to the factors in client’s life, is accounted for 30% to 40% of the counseling outcome (Lambert, 2013; Norcross, & Lambert, 2011). Client factors include attendance in counseling, active contribution, demographics, pathology, comorbidity, motivation, attachment style, coping style, psychological mindedness, access to emotion and experience, perfectionism and self-criticism (Lambert, 2013). According to Bohart and Tallman (2010) client factor provides the best explanation for the findings that there are no substantial differences between theoretical orientations in terms of counseling outcome.

Figure 1. Percentage of total psychotherapy outcome variance attributable to therapeutic factors
Norcross, & Lambert, 2011

College Counseling Models

The Counseling Cube Model and the Global Cube Model

One of the earliest models in the college counseling literature is the cube model takes a traditional approach in collegiate mental health care and provide early intervention, education, prevention, and counseling (Morrill et al., 1974). The original model was revised in 1990s and included other stakeholders on campus by encouraging a more interactive process and active collaboration between campus administrative units (Pace et al., 1996). Counseling centers in the revised model also play a consulting role to campus community as a way to assist students with mental health needs rather than strictly adopting a position of treating, "fixing," or "removing" the student (Pace et al., 1996).
Downs et al. (2018) suggested that these two models were the precursors for many of the existing counseling programs seen at colleges and universities today where counseling services operates as a separate entity than health services. These programs in today’s collegiate mental health landscape have been subject to empirical inquiry in some studies. The overall quality of care provided by these programs was found to be effective for most mental health issues and helped facilitate academic success among college students (Lockard et al., 2013; Locke et al., 2012; Minami et al., 2009; Snell et al., 2001; Wilson et al., 1997). Most of these studies were from single-site studies and this model alone is insufficient to meet the contemporary collegiate mental health needs (Downs et al., 2018). There is still no sound empirical evidence to suggest that these programs are effective and efficient in addressing the mental health needs of students with severe mental illness.

**Public Health Model**

The Public health model aims to promote positive mental health and adaptive behaviors as an early intervention method (Kobau et al., 2011). Early interventions in mental health issues are addressed before they cause functional impairment (Mihalopoulos, McGorry, & Carter, 1999). It is, therefore, hypothesized that a public health approach would reduce the need for services (Mrazek & Haggerty, 1994).

Campus Mental Health Action Planning and the “Set to Go” initiative that was developed by the JED Foundation and Education Development Center are prominent contemporary examples of public health model on college campuses (The Jed Foundation and EDC., 2011). More recently, Parcover et al. (2015) proposed a public health approach on college campuses incorporating outreach programs, co-curricular programs, a 1-credit first-year experience course,
workshops for time management, stress management and self-care, relationship conflicts, assertiveness skills, body image, and recognition of depressive symptom. They suggested that counseling centers should establish strong relationships with the key stakeholders on campus including residence life, dean of students’ office, campus police, and faculty in order to establish a strong referral network. Research suggests that public health programs for mental health in the community helped reduce stigma around mental health needs and increase help-seeking behavior (Henderson et al., 2013).

**Stepped Care Model**

The Stepped care model has been proposed in order to increase the efficiency of mental health resources and subsequently improve the poor access to the services (Kaltenthaler et al., 2002; Scogin et al., 2003). This model aims to produce the desirable treatment outcome without wasting mental health resources. Stepped Care is a system of delivering and monitoring treatments, so that the most effective yet least resource intensive, treatment is delivered to clients first; only ‘stepping up’ to intensive/specialist services as clinically required. (Bower et al., 2006).

The research on the stepped care model in addressing mental health issues has yielded mixed results. While some studies found that stepped care produce better outcomes than medication-only treatment for depression and anxiety (Muntingh et al., 2014; Oosterbaan et al., 2013), others indicate that the difference in treatment outcomes are not significant (Seekles et al., 2011; van Straten et al., 2006). No study suggested that stepped care produced less effective outcomes than treatment-as-usual (TAU) - in this case medication only.
Cornish and his colleagues (2017) proposed a model of stepped care to meet the contemporary mental health needs of college students and how it has been implemented at three North American universities. This model used a nine-step design in relation to intervention intensity and student autonomy/self-advocacy that ranges from walking-consultation/watchful waiting (step 1) to referral to tertiary or acute care (step 9). These authors also asserted that the experiences in these three universities were positive but there is a need to evaluate the effectiveness of the model. It should be noted that stepped care model has not yet been empirically assessed on a campus setting.

**IPBH Model**

Most IPBH programs on college campuses are not fully-integrated because they do not follow a single treatment plan for all clients (Turner et al., 2018). The National College Depression Partnership (NCDP) created a collaborative care network involving more than 40 colleges and universities through screening of over 300,000 students for depression in primary care settings (Network for Improvement Innovation in College Health, 2018). A pilot study by the IPBH approach for depression showed promise for improving depression identification and care for college students though the use Patient Health Questionnaire - 9 (PHQ-9; Chung et al., 2011). IPBH models which combine psychiatry, primary care, health promotion, and counseling provide promising interventions for college students (Downs et al., 2016).

**Online Counseling**

Online counseling is another way to address the growing need for mental health services in US college campuses. Mallen, Vogel, and Rochlen (2005) asserted that online counseling is helpful for addressing client problems. Kadison (2006) echoed the utility of online counseling for
college students and suggested that they may be more open to online counseling. It is also possible that online counseling may appeal to college students because of the disinhibition effect that enables clients to express themselves honestly to a therapist without feeling ashamed (Cook & Doyle, 2002). Lewis et al. (2015) found that there are some college students who experience alienation and who are uncomfortable with engaging in face-to-face counseling, but they also noted gender differences in these attitudes.

**Theoretical Framework**

Engel (1977) introduced the Biopsychosocial theory, which is an interdisciplinary framework focusing on biological, psychological, and socio-ecological factors in health. All conceptual models within the movement of integrated care have roots in Engel’s original biopsychosocial theory (Collins, Hewson, Munger & Wade, 2010). Engel believed that the biomedical model is based on body-mind dualism and requires that data of a psychological or social nature must be reduced to biochemical terms before they can be studied (Engel, 1981). He also criticized the medical science for owning the pride of the success of treatments because “the success of the most biological treatments is influenced by psychosocial factors, for example, the so-called placebo effect” (Borrell-Carrio, Suchman, & Epstein, 2004, p. 577). Adopting the perspective of Biopsychosocial framework would enable mental health service providers to better understand the rich patterns of interactions between biological, psychological, and socio-environmental factors to provide a holistic therapeutic approach (Engel, 1980).

IPBH for mental disorders have roots in biopsychosocial theory. IPBH is defined as a diverse group of health care professionals with different specialties including, but not limited to, one’s primary care physician, physician assistant, nurse practitioner, counselor, psychologist, and
psychiatrist (SAMHSA, n.d.). These professionals are responsible for providing and supporting patients as well as implementing and revisiting their treatment plans. The biopsychosocial paradigm is closely related to the variables found and discussed in the IPBH literature, and under the investigation in this study including different levels of care, psychiatric care, and combined behavioral/medical therapy.

Engel (1977) believed the importance of understanding and responding clients’ issues, but more importantly acknowledging that they were understood. His model of care required clinicians to attend the biological, psychological, and social dimensions of mental illness simultaneously (Borrell-Carrió, Suchman, & Epstein, 2004). A typical psychiatric visit lasts between 15 to 20 minutes (Cruz et al., 2013), which makes it almost impossible for a provider to attend those goals proposed by Engel. As an alternative, a team effort is needed to attain such goals where each team member focuses on the dimensions in their area of expertise.

The role of psychiatrists is essential in the integrated team in addressing mental health issues as they are trained both in medical and behavioral sciences, and are capable of providing insights and treatment recommendations for complex mental health issues (Raney, 2015a). Gabbard and Kay (2001) asserted that psychiatrists are distinct from all other mental health professionals in that their training and expertise allow them to be the ultimate integrators of the biological and psychosocial perspectives underlying diagnostic understanding and treatment’. This view of contemporary psychiatry strongly relates to Engel’s biopsychosocial theory (Davies and Roache, 2017) and fits well with the psychiatrists’ consulting and integrative role between different health professionals.
The biopsychosocial formulation of cause-effect relationship in mental health influences clinical decision making (Davies, & Roache, 2017). For instance, when Leff and colleagues (1984) assessed the relapse rates of people with schizophrenia in their longitudinal study, they noticed that relapse rates are higher if family members were excessively critical over patients’ choices. They thought that a psychosocial intervention, in addition to medical treatment, would help reduce relapse rates if they could address the systemic issues in patients’ lives. Team members in IPBH models formulated the cause-effect relationship case by case to determine the course and diversification of interventions (Vanderlip et al., 2016).

Engel’s biopsychosocial theory has its origins in Adolf Meyer’s eclecticism (Ghaemi, 2010). Meyer emphasized the appreciation of whole person with his or her entire psychosocial history and thought that one perspective is insufficient to appreciate the wholeness (Muncie, 1974). Meeks and Depp (2003) pointed out that mental health treatment is often limited to routine prescriptions to treat symptoms and to infrequent follow-up visits, which is insufficient to address the multi-dimensions in mental disorder etiology. Yager (1977) explained how eclectism in biopsychosocial paradigm works: different perspectives are not necessarily mutually exclusive; in fact, they may complement each other. Likewise, in IPBH models, psychotropic medications and behavioral therapies may complement each other and work better together.

**Current study**

Taking into account Biopsychosocial theory, it was hypothesized that, after controlling for time and individual variance nested in three different treatment groups ([1] counseling, [2] counseling and primary care, and [3] counseling, primary care and psychiatric care) within the IPBH program in this study, the full implementation of the IPBH approach where counseling,
primary care and psychiatric care fully collaborate with one another would be more effective and efficient than stand-alone counseling intervention for improving symptoms among college students presenting with severe mental health symptomatology.

The inclusion of the Biopsychosocial framework in collegiate mental healthcare provides a more holistic understanding of the factors impacting the counseling outcomes of students with severe mental health symptoms. The IPBH model would be a viable approach to increase the effectiveness and efficiency of collegiate mental health programs to help achieve the “Triple Aim” in the healthcare services in the US of Improved experience of care, improved health of populations, and reduced per capita costs of healthcare. This increased effectiveness and efficiency in counseling outcomes for students with severe mental health issues may also help alleviate the burden on college health centers in dealing with the high demand for mental healthcare.

There have been only a handful of studies that have empirically assessed the various delivery models to address mental health needs on college campus settings although a number of models mentioned above are widely being implemented. Most of these studies came from the global cube model which is a traditional approach in dealing with mental health needs on college campuses. Research suggests that traditional approaches are unable to meet the current demand while no empirical evidence exists for the effectiveness of college counseling programs specifically for students with severe mental illness. There is a need to assess the new models that have given promising results in community settings and would also be a viable option for collegiate mental health to address the increasing trend in severity.
Chapter 3

METHODOLOGY

Ex-post facto design with a secondary dataset was used in this study. This type of quantitative research design has researchers start investigating after the fact has occurred (Salkind, 2010). This chapter explains the methods used to answer the study’s research questions, and discusses the study’s data, sample, variables, and data analysis procedures.

Description of Variables

Dependent variables

The one dependent variable that was examined was the Global Mental Health Scale score. This is a composite score on the BHM-20 that indicates the level of distress (Kopta et al., 2014). BHM-20 is a 20-item psychometric assessment that was developed for college counseling centers.

Independent variables

Growth curve modeling accounts for time and individual variance as independent variables in the analysis, so that three independent variables were analyzed in the data. Table 1 provides a summary of the variables under the investigation in this study.

Table 1.

<table>
<thead>
<tr>
<th>Variables and Constructs</th>
<th>Instruments/measurements</th>
<th>The level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome variable</td>
<td>Global Mental Health Functioning</td>
<td>Global Mental Health Subscale of Behavioral Health Measure - 20</td>
</tr>
<tr>
<td>Independent variable 1</td>
<td>Type of intervention</td>
<td>(1) Counseling, (2) counseling and primary care, and (3) counseling, primary care and psychiatric care</td>
</tr>
<tr>
<td>Independent variable 2</td>
<td>Clients</td>
<td>267 clients in the final sample</td>
</tr>
</tbody>
</table>
Research Questions

The purpose of this study was to investigate the effectiveness and efficiency of an IPBH program for students experiencing severe mental health symptoms using counseling session-by-session treatment outcome measures in a routine clinical setting on a college campus. The following research questions guided the research of this dissertation thesis:

RQ1. Is the counseling and primary care intervention more effective at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

H1: The counseling and primary care intervention is more effective than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program

RQ2. Is the counseling and primary care intervention more efficient at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

H2: The counseling and primary care intervention is more efficient than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program

RQ3. Does the addition of psychiatric care to the counseling and primary care intervention improve global mental health functioning among college students experiencing severe mental health symptoms?
H3: Addition of psychiatric care makes counseling and primary care intervention significantly more effective and efficient at improving global mental health functioning among college students with severe mental health symptoms.

Participants

This dissertation study used archival data collected between 2011 – 2018 from an integrated primary and behavioral health center in a small campus setting in the mid-Atlantic region of the US. The integrated primary and behavioral healthcare center is located in one of the branch campuses of a large public university that has 3,491 students (93.8 % traditional college age [17-24]). 55% of students are male and 45 % are female. 75.1 % of students are White, and 24.9 % are from minority groups (7.3 % international, 7.2 % African American, 5.6 % Hispanic, and 5 % Asian). The campus offers 2 and 4-year programs. No graduate program is offered.

The data set includes 2,039 students who were engaged in individual counseling in the integrated primary and behavioral health center with 12 licensed professional counselors over an 8-year period. Only student clients who were in the caseloads of licensed professional counselors were included in order to control the quality of counseling interventions. Students who scored 2.07 and lower (N=451) on the Global Mental Health Scale (GMHS) on the BHM-20 in the initial session were selected in this sample because this study focused on the students with severe mental health symptoms. A score of 2.07 and lower on the GMHS of the BHM-20 indicates severe mental health symptomatology (Kopta et al., 2014).

Students who had more than three counseling sessions (N= 339) were selected among 451 students with severe mental health symptoms because at least three time points are required for modeling growth curves (Raudenbush, & Bryk, 2002), which is one of the primary statistical
method in this study. Students who did not continue receiving services on an on-going basis (e.g. dropping out and initiating services after a long-time interval) were excluded. The total number of students who met all criteria above for the final sample was 267.

Despite the severity of mental health symptoms in this final sample ($N=267$), not all students received the more intensive care due to (1) being on a waiting list for psychiatric appointments at the time and (2) students’ personal preference over not taking stepped up care (medication management) and receiving counseling services only. The final sample received three different interventions: (1) Counseling only, (2) counseling and primary care and (3) counseling, primary care, psychiatric care.

**The IPBH program in this study**

The data in this study was collected from an integrated college health center that provides primary care, counseling, student disability services, and health education at a public college with approximately 3,500 students. The behavioral health team is staffed by 4 full-time, and one part-time, licensed professional counselors who provide individual and group counseling, and case management services at a time. 12 different licensed professional counselors were employed on a full-time or part-time basis over an 8-year period. The primary care staff includes one full-time registered nurse (RN), one-full time physician assistant (PA), one full-time medical assistant, one part-time medical assistant, and one part-time primary care physician (PCP; 20 hours per week). The center also employs one full-time health educator and one full-time disability services coordinator. The center also has a consulting psychiatrist who joins the interdisciplinary team meetings once a month to review the referral list with the care team and see approximately 7-8 student clients per month on campus. The center is accredited by the
Accreditation Association for Ambulatory Health Care (AAAHC). The center has an integrated medical record system. The integrated team develop and implement collaborative treatment planning, meet on a regular basis to discuss cases and receive psychiatric consultation. The center would be considered as an integrated health center that has full collaboration in a transformed/merged practice according to Heath et al.’s (2013) six level-classification of integration.

**Instruments/Measures**

The Global Mental Health Subscale of Behavioral Health Measure 20 (BHM-20; Kopta & Lowry, 2002) was used to track session-by-session progress in client psychosocial functioning. The BHM-20 is included in the computer-based Celest Health System-MH (CHS-MH; Bryan, Kopta, & Lowes, 2012) and was developed for college counseling centers. The BHM-20 is a 20-item client-report questionnaire that assesses the three phases of behavioral health: (a) well-being (distress, life satisfaction, motivation), (b) psychological symptoms (depression, anxiety, panic disorder, mood swings associated with bipolar disorder, eating disorder, alcohol/drug abuse, suicidality, risk of violence), and (c) life functioning (work/school, intimate relationships, social relationships, life enjoyment) and higher scores indicate better psychosocial functioning (Kopta, & Lowes, 2012). The psychological symptoms scale includes 13 items measuring some of the most common symptoms that clients present with to counseling, such as symptoms of depression, anxiety, panic, mood swings, eating problems, and alcohol- or drug-use problems. There are two items assessing suicidality and one evaluating risk of violence. Clients responded to the items on a 5-point Likert scale ranging from 0 (*almost always*) to 4 (*never*). A score of
2.91 or higher indicates no significant distress on the Global Mental Health Scale of BHM-20 (Kopta, & Lowry, 2002).

BHM-20 showed strong correlations \((rs > .81)\) with similar psychometric measures such as the BASIS-32 (Eisen, Wilcox, Leff, Schaeffer, & Cullhane, 1999), OQ-45 (Lambert & Finch, 1999), SCL-R-90 (Derogatis & Savitz, 1999), and COMPASS (Howard et al., 1992; Kopta & Lowry, 2002). The BHM-20 also demonstrated strong internal consistency for the overall Global Health Measure index (e.g., \(\alpha > .85\)) and two-week test–retest correlation \((r = .80;\) Kopta, & Lowes, 2012).

**Procedures**

The Institutional Review Board approved the use of archival data and determined that the study is exempt. De-identified client and counselor data was delivered to the doctoral student by the counseling center in order to protect participants’ privacy. Students who were engaged in individual counseling were recruited in six different ways:

1) Self-referrals

2) Patient Health Questionnaire – 9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) screening through primary care visits leading to internal referrals for individual counseling

3) PHQ– 9 screening through health education and promotion visits leading to internal referrals for individual counseling

4) PHQ– 9 screening through student disability resources visits leading to internal referrals for individual counseling
5) Faculty and staff referrals through the campus early alert system - which is a campus-wide online notification system between the integrated health center and other administrative and/or academic unit within the campus.

6) Local hospitals that admitted students for mental health crises and referred them to the on-campus integrated health center for continuing health care.

The BHM-20 was administered before each counseling session at the kiosks upon check-in to monitor session-by-session progress in psychosocial functioning. It takes approximately 90 seconds to complete the questionnaire. The screening tool for the internal referrals, PHQ-9, that was used before primary care, health education, and disability resources visits, is a reliable and valid measure in making criteria-based diagnoses of depressive disorders (Kroenke, Spitzer, & Williams, 2001) and widely used in primary care environments as a brief screening tool for depression.

**Research Design**

An ex-post facto quasi-experimental study design was used to explore the effectiveness and efficiency of the different levels of care within a collegiate IPBH program. Ex-post facto research investigates “the world as it naturally occurs” and explores phenomena that have already occurred (Johnson & Christensen, 2008, p. 257).

Ary et al. (2010) asserted that an ex-post facto research design is appropriate when researchers want to investigate the relationship between dependent and independent variables, but randomization of the independent variable is not possible. Ex-post facto design cannot acquire as much data as an experimental design; therefore, it provides less evidence for a causal
relationship (Ary et al., 2010). While these limitations exist, ex post facto research contributes valuable information to the field of counseling from naturalistic settings.

The primary statistical analyses of this research were repeated measures of ANOVA and Growth Curve Modeling, which is a specific case of Hierarchical Linear Modeling. These analyses were used to test each of the hypotheses. A mixed ANOVA design may also be a replacement for the multilevel growth curve modelling, but the hierarchical nature of the clinical counseling data in this study makes the multilevel modelling a more viable and reliable option to account for time and student variable in the nested data. Research has shown that overlooking nested structures in data can impact estimated variances (Moerbeek, 2004), and increase Type I error rates (Wampold & Serlin, 2000). Growth curve modeling helps estimate the impact of the different interventions, controlling for variances between time series (counseling sessions) and each student subject. More specifically, growth curve modeling allows for the estimation of inter-individual variability in intra-individual patterns of change over time in longitudinal data (Bryk, & Raudenbush, 2002). This statistical method is particularly helpful in clinical studies to investigate slopes or growth trajectories among individuals that might take on a variety of different characteristics such as flat, linear, or quadratic (Curran, Obeidat, & Losardo, 2010).

Bryk and Raudenbush (2002) reported that multilevel models represent subjects’ growth rather than the interaction of repeated observations and more robust for missing and erratic data. Even though there was no missing data, unequal number of counseling sessions across the subjects, the number of counseling sessions per student ranges from 3 to 57 made this data set erratic. Multilevel growth curve techniques offer more advantages than multivariate repeated measures for naturalistic studies, such as this, in that they account for erratic data.
Threats to Internal Validity

Threats to the internal validity of any study occur when researchers make inaccurate inferences from the research results. This is typically the case whenever anything other than the independent variable affects the dependent variables (Campbell, & Stanley, 1963). In order to prevent these effects on the dependent variable(s), researchers must be aware of and control for effects on the dependent variable (Johnson & Christensen, 2008). Researchers need to use caution when making inferences from the study because ex-post facto research does not control the independent variables (Ary et al., 2010; Johnson & Christensen, 2008).

Several factors may have influenced the conclusion drawn from this study’s findings. The most critical threat to internal validity in this study would be the post hoc fallacy if a false causation was drawn between the dependent and independent variables (Ary et al., 2010). Ex-post facto design cannot provide evidence that this relationship is not due to other factors although it is robust in establishing statistical relationships between dependent and independent variables (Johnson & Christensen, 2008). It was possible in this study that BHM-20 scores which measured psychosocial functioning and mental health symptoms of the students may have been affected by extraneous variables that are not controlled.

Research in psychotherapy consistently indicates that *extratherapeutic* change, defined as factors that are qualities of the client or qualities of his or her environment account for approximately 40 percent of the therapeutic outcome. Similarly, *common factors* that are found in a variety of counseling approaches, such as empathy and the therapeutic relationship are responsible for approximately 30 percent (Lambert, 2013). Powerful statistical methods would
allow researchers to account for some of the variance nested within these different factors, but it is difficult to control all of these variables even in randomized experimental designs.

One way to deal with this threat to internal validity is to employ statistical analyses that would account for variance in nested data structures using multilevel regression model (Heck, & Thomas, 2000). The use of Multilevel Modeling in this study accounted for the variance between counseling sessions and student subjects (level 1) before making conclusions for the main effects of the IPBH intervention (level 2).

**Threats to External Validity**

External validity refers to the ability of researchers to make generalizations based on the research findings (Campbell & Stanley, 1963). Several factors affected the ability to generalize the findings of this research to the broader population of collegiate mental health. Demographic information was limited to gender and race. The student sample consisted of participants from a small campus setting in a less populated predominantly White area where racial diversity was low. It would be appropriate to draw conclusions for IPBH models for campuses with similar demographic characteristics, but not for others (e.g., urban or suburban campus environments where racial and gender diversity is different).

There are a number of other elements in the IPBH practice that would affect the treatment outcomes as mentioned earlier in the literature review. These elements include regular case consultation with a psychiatrist (Bower et al. 2006), experience of primary care provider with mental health populations, the measurement-guided practice in clinical decision making (Vanderlip et al., 2016), and the use of mental health professionals as behavioral care managers.
(Roy-Byrne, 2016). The presence and absence of these elements were also an important aspect in making generalizations about the outcome of this study.

**Data Analysis**

**Preliminary analysis**

The preliminary analysis of outcome data was aimed at seeing if counselors differed from one another because previous literature suggests that there is a significant variation between mental health providers regardless of their theoretical orientation, age, number of years of experience (Okiishi et al., 2003, 2006; Banham, & Scweitzer, 2016). A multilevel modeling was performed using counselors as predictors on the treatment outcome. Gender and race were also evaluated as individual level variables to determine if they predict the treatment outcomes.

**RQ1.** Is the counseling and primary care intervention more effective at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

**H1:** The counseling and primary care intervention is more effective than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program

**RQ2.** Is the counseling and primary care intervention more efficient at improving global mental health functioning among college students with severe mental health symptoms than counseling intervention alone within the collegiate IPBH program?

**H2:** The counseling and primary care intervention is more efficient than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program
RQ3. Does the addition of psychiatric care to the counseling and primary care intervention improve global mental health functioning among college students experiencing severe mental health symptoms?

**H3:** Addition of psychiatric care makes counseling and primary care intervention significantly more effective and efficient at improving global mental health functioning among college students with severe mental health symptoms.

**Hypothesis 1.** The counseling and primary care intervention is more effective than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program.

This hypothesis was tested conducting a repeated measures of ANOVA to compare pre and post changes in three different treatment groups in the quasi-experimental design; counseling alone intervention, counseling and primary care intervention, and counseling, primary care and psychiatric care intervention altogether. The following notation represents the null and alternative hypothesis:

**Null hypothesis 1:** \( \mu_1 = \mu_2 \)

**Alternative hypothesis 1:** \( \mu_1 < \mu_2 \)

where \( \mu \) is the mean for each treatment group.

**Hypothesis 2.** The counseling and primary care intervention is more efficient than counseling intervention alone to reduce severe symptoms students within the collegiate IPBH program.

Growth-Curve Modeling, which is a specific case of Hierarchical Linear Modeling, was used in order to compare the growth curves of students within each treatment group (counseling alone,
counseling and primary care, and counseling, primary care and psychiatric care). This statistical procedure accounted for the time and student variance to avoid a potential type I error.

This method is useful when data is hierarchically structured in natural settings such as educational and clinical environments (Heck, & Thomas, 2000). A 2-level hierarchical model was built by using GMHS scores across time and individuals as the level-1 unit, nested within the intervention types (level-2). Deviance statistics were used where model-fitting was achieved by the –2 restricted log likelihood (–2LL) instead of using p-values to test the models. First, the unconditional models with no predictors (Model 1 and 2) were built to assess between-student variation based on the GMHS scores. These models addressed the average scores for students at the intake session and if students’ scores at the intake varied between them. In models 3a and 3b, it was possible to estimate the impact of the treatment, which had a fixed effect value.

The following is a summary of the hypothesis testing for each model in the 2-level growth curve modeling. In models 1 and 2, within-individual effects were tested:

**Null hypothesis 2a:** within-individual effect = 0

**Alternative hypothesis 2a:** within-individual effect ≠ 0

In models 3a and 3b, treatment group mean GMHS relative to all treatment groups were tested:

**Null hypothesis 2b:** between-treatment group difference = 0 OR \( \beta_{10} = \beta_{20} = \beta_{30} \)

**Alternative hypothesis 2b:** between-treatment group difference ≠ 0 or \( \beta_{10} < \beta_{20} < \beta_{30} \)

where \( \beta \) is the mean slope each treatment group.

**Hypothesis 3.** Addition of psychiatric care makes counseling and primary care intervention significantly more effective and efficient at improving global mental health functioning among college students with severe mental health symptoms.
Growth curve modeling was used to test the hypothesis 3, as well.

**Null hypothesis 3:** Between-treatment group difference \( = 0 \) or \( \beta_{20} = \beta_{30} \)

**Alternative hypothesis 3:** Between-treatment group difference \( \neq 0 \) or \( \beta_{20} < \beta_{30} \)

where \( \beta \) is the mean slope each treatment group.

**Limitations**

Several factors limited the ability to infer and generalize from the study’s findings. Because an ex post facto research design was used, random assignments to the treatment groups were not possible. It was impossible to conclude with full confidence that the independent variable, in this study the treatment, was the cause of the significant relationships rather than some other spurious variable.

It was impossible to choose the experimental groups in ex-post facto designs since the treatments had already occurred. (Salkind, 2010). Selection of the participants was solely based on the severity of their initial scores on the BHM-20 assessment. These individuals may have had co-occurring disorders, which may have not been reflective on the psychometric assessment. Also, diagnostic information about the subjects was unknown.

Response bias is the tendency of a person to answer questions on a survey untruthfully or misleadingly (Furnham, 1986). Response bias would have particularly been an issue in this study because students had to complete BHM-20 assessment at the kiosks in order to check in for their counseling appointment. Social desirability in responding questions or late arrivals to the counseling appointments may have created the tendency to answer questions untruthfully or misleadingly.
Chapter 4
RESULTS

Descriptive Statistics

152 students received counseling-only intervention, 69 students received counseling and primary care intervention, and 46 students received counseling, primary care and psychiatric intervention among 267 students. The sample of targets includes 162 female students (61.3%) and 105 male students (38.7%). Seventy eight percent of sample were White (n = 206), eight percent were African American (n=21), four point five percent were Latinx (n=12), three percent were Asian (n= 8), three percent were international who were on a student visa (n=8), two point seven percent were mixed race (n=7), and zero point eight percent were other race (n=2) as seen in table 2.

The mean GMHS scores, anxiety scores, and depression scores at the intake were not statistically different across the three intervention groups. The mean GMHS score based on BHM-20 (Kopta, & Lowry, 2002) in the intake session for the counseling only intervention group was 1.67 (SD = 0.34); counseling and primary care intervention group was 1.70 (SD = 0.26); and counseling, primary care, and psychiatric care intervention group was 1.75 (SD = 0.32) on a 0 to 4.00 range where lower scores indicate more severe distress. The mean anxiety score based on BHM-20 Anxiety Subscale (Kopta, & Lowry, 2002) in the intake session for the counseling only intervention group was 1.08 (SD = 0.64); for the counseling and primary care intervention group was 1.09 (SD = 0.63); for the counseling, primary care and psychiatric care intervention group was 1.26 (SD = 0.60) on a 0 to 4.00 range where lower scores indicate severe distress. The mean depression score based on BHM-20 Depression Subscale (Kopta, & Lowry,
2002) for the counseling only intervention group was 1.19 (SD = 0.45); for the counseling and primary care intervention group was 1.13 (SD = 0.43); for the counseling, primary care and psychiatric care intervention group was 1.27 (SD = 0.49) within the same 0 to 4.00 range where lower scores indicate severe distress.

The number of the sessions students were engaged in counseling ranged from 3 to 57. 22% of students had a total of three sessions (n=59), 14.6% of students had a total of four sessions (n=39), 13.8% of students had a total of five sessions (n=37), 10.4% of students had a total of six sessions (n=28), 6.4% of students had a total of seven sessions (n=17), 6.4 % of students had a total of eight sessions (n=17), 5.2% of students had a total of nine sessions (n=14), 4.4% had a total of ten sessions (n=12), 2.6% had a total of eleven sessions (n=7) and 14.2% of students had a total of twelve or more sessions (n=37). Students in the counseling only treatment group had a maximum of 25 counseling sessions, students in counseling and primary care treatment group had a maximum 45 sessions, and students in counseling, primary care and psychiatric care treatment groups had a maximum of 57 sessions.

Table 2

*Descriptive Statistics for the initial mean scores based on BHM-20† subscales (N = 267)*

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>N</th>
<th>GMHS</th>
<th>Anxiety</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1*</td>
<td>152</td>
<td>1.67</td>
<td>1.08</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(SD=0.34)</td>
<td>(SD=0.64)</td>
<td>(SD=0.45)</td>
</tr>
<tr>
<td>Group 2**</td>
<td>69</td>
<td>1.70</td>
<td>1.09</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(SD=0.26)</td>
<td>(SD=0.63)</td>
<td>(SD=0.43)</td>
</tr>
<tr>
<td>Group 3***</td>
<td>46</td>
<td>1.75</td>
<td>1.26</td>
<td>1.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(SD=0.32)</td>
<td>(SD=0.60)</td>
<td>(SD=0.49)</td>
</tr>
<tr>
<td>Total</td>
<td>267</td>
<td>1.69</td>
<td>1.11</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(SD=0.32)</td>
<td>(SD=0.63)</td>
<td>(SD=0.45)</td>
</tr>
</tbody>
</table>
Note. *Counseling-only; **Counseling + Primary Care; ***Counseling + Primary Care + Psychiatric Care. † Scores range between 0 to 4.00. Higher score indicates better mental health functioning.

Table 3

Characteristics of Participants

<table>
<thead>
<tr>
<th>Baseline characteristic</th>
<th>Group 1*</th>
<th>Group 2**</th>
<th>Group 3***</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>94</td>
<td>61.8</td>
<td>43</td>
<td>62.3</td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>38.2</td>
<td>26</td>
<td>37.7</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>108</td>
<td>71.0</td>
<td>51</td>
<td>73.9</td>
</tr>
<tr>
<td>African American</td>
<td>17</td>
<td>11.2</td>
<td>6</td>
<td>8.8</td>
</tr>
<tr>
<td>Latinx</td>
<td>7</td>
<td>4.6</td>
<td>4</td>
<td>5.8</td>
</tr>
<tr>
<td>Asian</td>
<td>10</td>
<td>6.6</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td>Mixed Race</td>
<td>6</td>
<td>3.9</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td>International</td>
<td>4</td>
<td>2.7</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Number of Attended</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counseling Sessions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>32.9</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>17.8</td>
<td>7</td>
<td>10.1</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>12.0</td>
<td>13</td>
<td>18.8</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>9.8</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>7.2</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>5.9</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>5.3</td>
<td>4</td>
<td>5.8</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>2.1</td>
<td>4</td>
<td>5.8</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2.1</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>12 or more</td>
<td>7</td>
<td>4.9</td>
<td>16</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Note. N = 267, * Counseling-only; ** Counseling + Primary Care; *** Counseling + Primary Care + Psychiatric Care.
Preliminary Analyses

A series of one-way between-subjects ANOVAs were conducted to ensure that the initial scores at the intake based on GMHS, Anxiety Scale, and Depression Scale were not significantly different among the three intervention groups. This analysis was important to determine whether all students had similar levels of distress across all treatment groups at the intake to reliably test the effect of treatment. There was no significant difference for the initial GMHS scores, $F(2, 264) = 1.007, p = .367$; for the initial anxiety scores, $F(2, 264) = 1.358, p = .259$; and for the initial depression scores, $F(2, 264) = 1.539, p = .217$. Levene’s test revealed that the variance of the dependent variable, GMHS, across three treatment groups was equal, $F(2, 264) = 2.158, p = .118$. Thus, the sample met the assumption of homogeneity for conducting repeated measures of ANOVA.

Mixed ANOVAs were also conducted based on six and twelve sessions to determine the growth trajectories among the treatment groups at different time points. These mixed ANOVAs revealed that counseling-only treatment group showed more of a linear trend for the first six counseling sessions while the trend for the counseling and primary care treatment group, and counseling, primary care and psychiatric care treatment group was more curvilinear. All three treatment groups started forming a quadratic trend after the seventh counseling session. However, trends after the 12th session were not as reliable because only 14.2% of the students had more than 12 counseling sessions (which corresponded to 10.5% of all measurements). This created a major limitation related to determining trends following the 12th session. These later growth trajectories were based upon limited observations that steadily dropped to one observation in the 57th time point.
Before proceeding with the development of a model with predictors, both linear and a quadratic growth were examined. Linear time series (1, 2, 3, 4 …) in the data were converted into quadratic terms (0, 1, 4, 9 …) following the procedures described by Heck, Thomas, and Tabata (2014). Both linear and quadratic terms were added to null model with no predictors. This unconditional model had an intercept of 1.833 and both linear time \( t (385.637) = 14.611, p < .001 \) and quadratic time \( t (264.936) = -9.805, p < 0.001 \) were significant in explaining individual differences in randomly varying slopes. Note that mixed linear analyses on SPSS applied Satterthwaite (1946) correction for the degrees of freedom and yielded numbers with decimals.

Level one (gender and race) and level two predictors (counselor) were also examined to determine whether they were viable to be included in further models in evaluating treatment effects. Race was dummy-coded as White and non-White due to the small number individuals in each category of the non-White sample. The model of individual characteristics (race and gender) and the counselor caseload students belonged to with fixed effects showed that these variables did not account for the variance in individual growth differences (see table 3). Thus, these variables were not included in the further models.

<table>
<thead>
<tr>
<th>Table 4.</th>
<th>Gender, race (level-1), and counselor (level-2) as predictors of therapeutic outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed effects</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Gender</td>
<td>.008</td>
</tr>
<tr>
<td>Race</td>
<td>-.036</td>
</tr>
<tr>
<td>Counselor</td>
<td>.0040</td>
</tr>
</tbody>
</table>
Repeated Measures of ANOVA

Research Question 1

The first research question introduced in the study was as follows:

- The full implementation of IPBH intervention is more effective than counseling intervention alone to reduce severe symptoms students.

To answer this question, a repeated measures of ANOVA using treatment groups as the between subject factor was conducted to compare the effect of treatment groups based on initial and final scores of GMHS. The results of ANOVA on pre and post-test differences among three treatment groups were not significant. There was a significant effect of time (Wilk’s $\Lambda = .511$, $F(1, 263) = 251.797$, $p < 0.001$, $\eta^2 = .49$) but no main effect for time by treatment interaction (Wilk’s $\Lambda = .996$, $F(2, 263) = .579$, $p = 0.561$). Therefore, the null hypothesis ($\mu_1 = \mu_2 = \mu_3$) was not rejected. Students in all treatment groups improved significantly, but treatment groups demonstrated similar performances (see table 4).

Table 5.

Summary of Repeated Measures of ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>0.043</td>
<td>2</td>
<td>0.021</td>
<td>0.128*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>63.595</td>
<td>263</td>
<td>0.242</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3451.65</td>
<td>265</td>
<td>0.242</td>
<td></td>
</tr>
</tbody>
</table>

Note. $* p = 0.880$

When clinical significant scores are considered, all three treatment groups showed similar performances as well. 28 % ($n=75$) of students in the overall sample reached a score of 2.91 or higher on GMHS. 28.2 % of students ($n=43$) in the counseling-only group, 28.9 % of students...
(\(n=20\)) in the counseling and primary care group, 26.1 % of students (\(n=12\)) in the counseling, primary care and psychiatric care group reached a score of 2.91 or higher at the time of discharge.

Two-Level Model of Individual Change

Research Questions 2 and 3

The second and third research questions introduced in this study were as follows:

- The full implementation of IPBH intervention is more efficient than counseling intervention alone to improve global mental health functioning among college students.
- IPBH is significantly more effective and efficient with the contribution of psychiatric care to improve global mental health functioning among college students with severe mental health symptoms.

To answer these research questions, a two-level model of change was developed incrementally to assess the effect of treatment groups on student recovery curves. A series of growth curve models with restricted maximum likelihood estimation were run to analyze the main treatment effect and time by treatment interaction. The overall fit of the models was evaluated by the \(-2\) restricted log likelihood (\(-2\)LL) on a smaller-is-better rule. Moreover, comparison of nested models was also evaluated formally by a test of differences in \(-2\)RLL over the difference in degrees of freedom by using an ordinary \(\chi^2\) distribution. A significant difference indicates that the model with the lowest \(-2\)RLL value fits data better. Analyses were run in SPSS version 25.
Models 1 and 2 – Unconditional model with no predictor. Heck, Thomas and Tabata (2014) suggested that unconditional model with no predictor should include time related variables to figure out the shape of the growth trajectory. Two models (model 1 and 2) were developed as an unconditional model without adding the treatment effects. Linear and quadratic time components were added in model 1. Random effects of time across individuals were accounted to reach a more refined solution in model 2.

Before building the models described above, different covariance types (e.g. autoregressive, scaled identity, and unstructured) were tested for the repeated measures in order to determine the most suitable covariance type based on the data. Autoregressive covariance matrix (AR 1) provided a better fit in comparison to other covariance types based on the -2RLL estimation in the unconditional model. The estimate of the correlation between each repeated measure was significant in the unconditional model \([\rho^2 (\text{rho}) = .59, \text{Wald Z} = 22.816, p = .001]\) indicating that each measurement was based on the immediately preceding value. AR 1 covariance structure was used for the subsequent models for the repeated measures.

Linear and quadratic time components were added simultaneously in model 1 as described in preliminary analyses. Both linear \([ t (385.637) = 14.611, p < .001]\) and quadratic time \([ t (264.936) = -9.805, p < 0.001]\) polynomials are significant in explaining student recovery curves on GMHS. Therefore, the shape of the growth trajectories of students have both linear and quadratic components.

Interclass correlation coefficient (ICC) was calculated to determine whether or not further models were necessary. The ICC is calculated by dividing the variance in the intercepts, \(\sigma^2\), by the total variance (Bryk, Raudenbush, 2002): \(ICC = .075/(.075 + .274) = 0.214\).
The ICC showed that 21.4% of the variance was due to between individual variation. The null hypothesis 2a was rejected because a within-individual effect was observed in the growth trajectories. Additional predictors can be added in the subsequent models to further explain the variation in the student recovery.

In model 2, random effects of time across individuals were added. This addition significantly improved the estimation as evidenced by the decrease in -2RLL ($\Delta \chi^2 (0) = 79.556, p < .001$) from model 1 to model 2 noting that these two models had the same number of parameters. The variance in model 2 was compared to the variance in the model 1 using the following formula to assess how much variance in GMHS scores is accounted for the randomly varying slopes across the individuals in level one, (Byrk, & Raudenbush, 2002):

$$\frac{\tau_{\text{hat} 00 \text{ (old model)}} - \tau_{\text{hat} 00 \text{ (new model)}}}{\tau_{\text{hat} 00 \text{ (old model)}}}$$

$$= .274 - .225 / .274 = .178$$

That is, 17.8% of variance was due to the random effects of time across individuals.

Models 3a and 3b - Two-level Model with Fixed Treatment Effects. Both linear and quadratic time components were significant in explaining individual growth trajectories as indicated in the preliminary analyses. Treatment was added as a factor in the subsequent models. First, model 3a with the linear component only was developed. This model suggested that there was a significant time and treatment interaction ($F (164.883) = 17.111, p < .001$). The model did not improve from the model 2. (see table 5 for model comparisons). A quadratic function of time was added in model 3b to capture any acceleration or deceleration in the rate of growth that might occur over the repeated measurements. Although model 3b improved from model 2, this
difference was not statistically significant based on the Chi-Square difference test ($\Delta \chi^2 (4) = 3.253, p > .05$).

Model 3b, with linear and quadratic growth parameters, was retained as a final output in order to distinguish the development of recovery over measurement occasions by treatment effect and time by treatment interaction. Treatment (Group 1=Counseling-only; Group 2=Counseling and Primary Care; Group 3=Counseling, Primary Care, and Psychiatric Care) was entered to the model 3b as a factor variable with fixed effects. Time by treatment interaction was also built into the model as a nested term. The positive estimate of linear growth in model 3b indicated that, on average, students’ mental health improved over time based on GMHS \[ t (144.044) = 5.663, p < .001 \]. Results suggested that growth trajectories of students in group 1 were significantly different than the other treatment groups as evidenced by the significant time and treatment interaction \[ t (175.294) = 4.058, p < .001 \]. Model 3b with treatment as level 2 predictor showed that, after controlling for the time and individual variance, students in different treatment groups exhibited slightly different recovery growths.

Table 6.

Model Comparisons based on smaller-is-better form

<table>
<thead>
<tr>
<th>Model</th>
<th>-2RLL</th>
<th>AIC*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1 (null model)</td>
<td>2745.766</td>
<td>275.766</td>
</tr>
<tr>
<td>Model 2 (random effects model)</td>
<td>2666.210</td>
<td>2672.210</td>
</tr>
<tr>
<td>Model 3a (linear-time model)</td>
<td>2683.889</td>
<td>2689.889</td>
</tr>
<tr>
<td>Model 3b (linear and quadratic time model)</td>
<td>2662.957</td>
<td>2668.957</td>
</tr>
</tbody>
</table>

*Note* Akaike’s Information Criterion

Finally, the variance attributable to the treatment effect was computed by comparing the variances in model 2 and model 3b:

\[
\tau_{\text{hat 00 (model 2)}} - \tau_{\text{hat 00 (model 3b)}} / \tau_{\text{hat 00 (model 2)}}
\]
\[ \frac{.225 - .222}{.225} = .013 \]

The computation above suggested that only 1.3% of the variance could be explained by the differences among the treatment groups. This variance seemed to be due to the slight difference in the growth trajectories between group 1 and groups 2 and 3. As a result, a large proportion of the variance across students in level 1 remained unexplained.

Hypothesis 2b was directional and predicted that the Counseling, Primary Care, and Psychiatric Care treatment group would be more efficient, therefore perform better than other groups. Model 3b revealed that students in counseling-only treatment group were recovered faster than the other treatment groups based on time by treatment interaction \[ t(164) = 4.058, \ p < .001 \]. No significant difference was observed in the slopes between counseling and primary care treatment group and counseling, primary care, and psychiatric treatment group. Thus, the null hypothesis for 2b was not rejected. Regarding the hypothesis 3, group 3 did not perform better than group 2, therefore the addition of psychiatric care to the primary care did not make any difference in the student recovery curves resulting in failing to reject null hypothesis 3.

Table 6 summarizes the final model of change and treatment effects. Figures 1 and 2 are visual representations of the growth trajectories across the treatment groups over 6 and 12 counseling sessions. The following equations represents the model 3b:

\[
Y_{it} = \text{Intercept} + (\text{Time}) + (\text{Quadratic}) + (\text{Treatment}) + (\text{Time} \times \text{Treatment}) + \text{Error}
\]

where \( Y_{it} \) is the repeated measure of GMHS for student \( i \) at time \( t \).
Table 7

Model 3b of change in GMHS scores for the entire sample

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimation</th>
<th>SE</th>
<th>t-ratio</th>
<th>Wald Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.822</td>
<td>.061</td>
<td>29.420*</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>.090</td>
<td>.016</td>
<td>5.663*</td>
<td></td>
</tr>
<tr>
<td>Quadratic</td>
<td>-.001</td>
<td>.0002</td>
<td>-6.100*</td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>-.19</td>
<td>.073</td>
<td>-2.655**</td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>-.04</td>
<td>.080</td>
<td>-.598</td>
<td></td>
</tr>
<tr>
<td>Group 3†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time*Group 1</td>
<td>.081</td>
<td>.020</td>
<td>4.058*</td>
<td></td>
</tr>
<tr>
<td>Time*Group 2</td>
<td>.004</td>
<td>.020</td>
<td>.190</td>
<td></td>
</tr>
<tr>
<td>Time*Group 3†</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Random effects (student*time)

<table>
<thead>
<tr>
<th></th>
<th>Estimation</th>
<th>SE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>σ² Within Participants</td>
<td>.222</td>
<td>.012</td>
<td>18.816*</td>
<td></td>
</tr>
<tr>
<td>σ² Intercept + Time</td>
<td>.005</td>
<td>.001</td>
<td>4.722*</td>
<td></td>
</tr>
</tbody>
</table>

Note.  * p < .001,  ** p < .01,† Group 3 is the comparison group in the fixed effects analysis.

Figure 2

Student Recovery over 6 Counseling Sessions

- Counseling-only
- Counseling + Primary Care
- Counseling + Primary Care + Psychiatric Care

Global Mental Health Scale

Session #
**Post-hoc analyses.** Visual inspection of the scatterplots and model 3b of change suggested that the entire sample exhibited a linear trend in the first seven counseling sessions for all treatment groups. This observation in the analysis yielded a further question of whether there was a significant difference between participants who continued treatment after the seventh session and those who discontinued the treatment at the seventh session. The continuation or discontinuation of treatment could be due to a possible variation in the recovery curves across students in the first seven counseling sessions or a more basic variation related to the differences in the treatment success across randomly varying participants rather than the fixed effect of the treatment groups.

The sample was split into two groups: (1) students who attended seven or less sessions \((N=165)\) and (2) those who attended eight or more sessions \((N=102)\), to examine if there was a
significant difference between the recovery trajectories of the two groups. This new grouping variable of treatment length was included as a fixed effect in an alternative linear model of change (Model 4) based on the first seven counseling sessions along with the fixed effects of the treatment groups. The inclusion of the new group variable into the model suggested that there was a significant time and treatment length interaction. There was a significant difference between the recovery curves of students who attended seven or less counseling sessions and those who attended eight or more counseling sessions. The students who attended seven or less sessions recovered faster than those who attended 8 or more session. Time and treatment interaction was no longer significant in this new model of change when treatment length was included in the model (see table 8).

Table 8

*Model 4 of linear change in GMHS scores for the entire sample based on the first seven counseling sessions*

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimation</th>
<th>SE</th>
<th>t-ratio</th>
<th>Wald Z</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.805</td>
<td>.056</td>
<td>31.698*</td>
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<tr>
<td>Time</td>
<td>.080</td>
<td>.016</td>
<td>4.895*</td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>-.068</td>
<td>.069</td>
<td>-.978</td>
<td></td>
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<tr>
<td>Group 2</td>
<td>-.104</td>
<td>.077</td>
<td>1.347</td>
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<tr>
<td>Group 3†</td>
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<tr>
<td>Time*Group 1</td>
<td>.025</td>
<td>.021</td>
<td>1.218</td>
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<td>Time*Group 2</td>
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<td>.023</td>
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<tr>
<td>Time*Group 3†</td>
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<tr>
<td>7 or Less Sessions</td>
<td>-.190</td>
<td>.057</td>
<td>-3.322*</td>
<td></td>
</tr>
<tr>
<td>8 or More Sessions††</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time*7 or Less Sessions</td>
<td>.102</td>
<td>.017</td>
<td>5.736*</td>
<td></td>
</tr>
<tr>
<td>Time*8 or More Sessions††</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Random effects (student*time)

| σ² Within Participants | .190 | .009 | 19.421* |
| σ² Intercept + Time    | .007 | .001 | 7.036*  |

Note. † p < .001, † Group 3 is the comparison group in the fixed effects analysis. †† 8 or more sessions is another comparison group in the fixed effect analysis.
Chapter 5
DISCUSSION

Increasing severity in mental health problems among college population have detrimental impact on college student academic achievement (Douce and Keeling, 2014). Recent literature on collegiate mental health suggested that Integrated Primary and Behavioral Healthcare (IPBH) would be beneficial to combat the growing mental health problems on college campuses (Pratt, Scott DeBerard, Davis, & Wheeler, 2012; Turner et al., 2018). Research on collegiate IPBH is scarce even though 13 percent of college counseling centers across the U.S. are integrated with primary care (CCMH, 2018).

This study investigated the effectiveness and efficiency of one collegiate IPBH program using the routine care data from an integrated primary and behavioral care program on a small campus setting among students with severe mental health symptoms. Students’ gender and race as level 1 variables and counselors as level 2 variance were also examined in the preliminary analyses to determine if they were accounted for the therapeutic outcome. These three variables were not significant to explain student recover in this sample. The results of the study are discussed in this chapter as well as the connections to related literature. The chapter is concluded by outlining the implications of the findings, explaining the current study’s limitations, and making recommendations for future research.

Discussion of Findings

Effectiveness of different levels within the collegiate IPBH program

It is crucial to investigate the effectiveness of different levels in an IPBH program within an integrated college health center in which students receive three different types of services for
their mental health issues. These three different treatments are: (1) counseling-only; (2) counseling and primary care; (3) counseling, primary care and psychiatric care. The results from research question 1 of current study suggested that there is no significant difference among the treatment groups based on students’ initial and final scores of Global Mental Health Scale (GMHS). Results show that all treatment groups improved significantly in average based on their GMHS scores.

This study compared different treatment groups within the IPBH program. The current study focused on the levels of treatment within an IPBH program where students with severe mental health symptoms may step up to more intense care (from counseling intervention alone to combined treatment). This is different from previous IPBH studies where integrated care were compared to non-integrated care in randomized clinical trials. However, the results in this study can be compared and contrasted with the previous IPBH research because routine care monitoring and outcome can provide valuable insight into the efficacy of a particular treatment approach and supplement the results in randomized clinical trials (Youn, Kraus, & Castonguay, 2012).

It was hypothesized in the current study that the counseling intervention would be more effective at improving mental health symptoms if primary care and/or psychiatric care are added to the treatment routine. This hypothesis was based on the previous randomized clinical trials which hypothesized that that primary care interventions are more effective at improving mental health symptoms when behavioral interventions are integrated with primary care, and behavioral care professionals (counselors, psychologists) collaborate with primary care staff on a shared caseload. (e.g. Unützer et al., 2002; Muntingh et al., 2016). Participants in the treatment-as-usual
groups in these studies received medication management only from either primary care and/or psychiatric care whereas the treatment groups received behavioral interventions in addition to primary care and/or psychiatric care. The current study and previous studies both hypothesized that the outcome of treatment would be superior if participants receive a combination of primary care and behavioral interventions. The current study, however, differs from previous studies in that all participants received counseling intervention regardless of the treatment group they belonged to. Some of these individuals stepped up to primary care and psychiatric care, and received these services in addition to counseling. In contrast, all participants in previous studies received primary care interventions. Some of these participants were randomly assigned to behavioral interventions in addition to primary care in order to assess the treatment effects for integrated care.

Despite the fact that there are no significant differences among the treatment groups in this study, all students improved on average at the time of their discharge regardless of the treatment intensity they received within the collegiate IPBH program. The average GMHS score at the discharge was below the clinical significance cut-off score for positive mental health of 2.91 (Kopta, & Owen, 2001). The counseling-only treatment group had an average GMHS score of 2.49 (SD=.056); the counseling and primary care group had an average GMHS score of 2.44 (SD=.083); the counseling, primary care and psychiatric care group had an average GMHS score of 2.47 (SD=.101). 28.1% of the total sample reached the clinical significance score. Studies using clinical significance cut off scores have reported a variety of treatment success rates in non-integrated mental health systems based on clinical significance scores. For instance, 17.7% recovery rate was observed among 363 children and adolescents (ages 4–17) served by an
outpatient community mental health system (Warren, Nelson, & Burlingame, 2009). Between 7.6% and 12.9% of 35,429 youth (5–17 years of age) showed clinically significant symptom improvement in another study investigating routine care patient data (Ash, & Weis, 2009). The rate of clinically significant improvement in this study increased at the 6, 9 and 12-month follow-ups. Schlegl et al. (2014) found that 41.4% of adults with moderate depression showed clinically significant improvement in a specialized inpatient treatment of adult anorexia nervosa (Schlegl et al., 2014). It should be noted that none of these studies focused on individuals with severe mental health symptoms at the intake.

Previous randomized clinical trials (e.g. Engel et al., 2016; Unützer et al., 2002) and meta analyses (Archer et al., 2012; Lenz, Dell’Aquila, & Balkin, 2018) suggested that primary care interventions are more effective when behavioral interventions are added to treatment regime and health professionals work collaboratively on a shared caseload. In contrast, the current study using routine care data suggested that there are no significant differences in the outcomes between counseling-only treatment and counseling, primary care and/or psychiatric care treatment within a collegiate IPBH program. It should be noted that the sample of this study consisted of students with severe mental health symptoms only. The design of the current study was also different from the previous IPBH studies.

### Efficiency of different treatment levels within the collegiate IPBH program

Efficiency in healthcare was identified as one of the six aims by the Institute of Medicine (IOM, 2006) to improve the quality of care. Investigated through research question 2 in this study was the efficiency of each treatment group after controlling time and individual variance in the collegiate IPBH program. Multilevel modeling indicated that there were differences in the
growth trajectories between the counseling-only group and other treatment groups. Visual inspection of scatterplots revealed that counseling-only group had a steeper growth trajectory through the first six counseling sessions, where a statistically significant time-treatment interaction occurred. Students in the counseling-only group recovered faster than those in the other treatment groups. Multilevel analyses suggested that this difference in the growth trajectories accounted for only 1.3% variance. All three treatment groups had a linear trend for the first six counseling session. The growth trajectory started to de-accelerate and became quadratic after the seventh counseling session. This quadratic trend continued to dominate late growth recovery curves in this sample. The linear trend showed that the GMHS scores of students improved consistently from one session to another in the first six counseling sessions. The quadratic trend after the seventh session suggested that the GMHS scores started fluctuating and no additional therapeutic benefit was gained.

It was hypothesized that the combination of counseling and primary care within the IPBH in this college setting would be more efficient at improving mental health symptoms based on the previous research on IPBH. Previous studies suggested that IPBH performed better than primary care alone, which was the least intense care, at reducing mental health symptoms in the short-term (3 to 6 months; e.g. Blanchard, Waterreuss, & Mann 1995; Dwight-Johnson et al., 2011), mid-term (6 to 12 months; e.g. Katon, 2010; Kroenke, 2010), and long-term (12-month or more; e.g. Ell et al., 2010; Simon et al., 2004; Wells, 2000) follow ups. The current study is the first study that used counseling session-by-session measurement outcome to assess the effect of IPBH. Contrary to the alternative hypothesis, the least intense care, which was counseling-only treatment group, performed better than the other treatment groups where primary care and
psychiatric care were added. Therefore, counseling-alone treatment was more efficient than the other treatment groups where students received a combination of counseling, primary care and/or psychiatric care. Counseling-only treatment group was more efficient because students in this treatment group were recovered faster than those in the other treatment groups.

Many factors could be contributing to better performance of counseling-only treatment group. One possible explanation is the stepped-care approach within this IPBH program. Students with less complex mental health issues were first managed in counseling-only treatment in this study. Students who had more complex mental health issues at the intake or those who were not improving in response to counseling-only treatment stepped up to a more intense care. This systematic monitoring and referral system within integrated team members is an essential component of many IPBH models (Vanderlip et al., 2016). The mental health condition of the students who received a combination of counseling, primary care and/or psychiatric care in the current study may have been more complex (e.g. comorbid conditions) than those who received counseling-only treatment due to the stepped care approach. The growth rate of these students who received primary care and/or psychiatric care in addition to counseling may have been slower than those who received counseling-only intervention due to the complexity of their mental health issues.

Previous studies have mixed results with regards to individuals with severe mental health issues who received counseling-only, medication-only, and a combination of medication and counseling. For instance, no significant differences were found in the therapeutic outcomes of individuals with treatment-resistant depression when they received medication-only, counseling-only, and a combination of medication and counseling (Thase et al., 2007). Gloster et al. (2020)
found in their meta-analysis that behavioral interventions were more helpful at improving symptoms and quality of life for individuals with mood and anxiety disorders who did not respond to primary care or psychiatric care interventions. The current study is more in line with Gloster et al. (2020), and suggests that counseling interventions may have better outcomes to positively impact student recovery among individuals with severe mental health symptoms.

The current study confirms the findings of several studies and meta-analyses (e.g., Archer et al., 2012; Lenz, Dell’Aquila, & Balkin, 2018) that counseling interventions make a significant contribution when they are added to primary care interventions. This study shows that primary care or psychiatric care interventions do not make a significant contribution to student recovery curves when added to counseling interventions. This raises the important question of why primary care or psychiatric care do not make a significant difference on student recovery curves when added to counseling?

A possible answer to the question above may be found in studies about the placebo effect of medical interventions. Benedetti et al. (2011) provided evidence that the effect of drugs can be modulated by cognitive and affective factors, which can increase or decrease the effects of the drugs. For instance, Kaptchuk et al. (2010) randomized patients with irritable bowel syndrome (IBS) to either open-label placebo pills or no treatment and found that the placebo treatment produced significant improvement in IBS symptoms. The therapeutic encounter including attentive listening and thoughtful conversation between the patients and the doctor improved the placebo response in patients taking pills with no active substances. This suggests that baseline primary care interventions may seed some hope among individuals and activate cognitive and affective factors responsible for an initial therapeutic gain. The effect
of the treatment may have been strengthened in the previous IPBH studies when more attentive listening and empathy is added to the treatment via counseling interventions. The cognitive and affective activation may have already been maximized by the baseline counseling interventions, which may explain the similar effects among intervention groups in the current study. Students may have not improved much better when primary and psychiatric care interventions were added to the counseling interventions, as the placebo effect no longer came into play.

The between-individual variation in the multilevel analysis was 17.8%. Treatment accounted for 1.3% of the variation in GMHS scores across time within students. This was a very small effect, which left a large portion of the variance across time within students unexplained. Findings from this study suggest that individual differences in this sample may better explain student recovery. These individual differences may be attributable to the extra-therapeutic events in students’ life (Lambert, 2013) or factors affecting treatment resistance related to pathology, environment, client, and clinician (Bystritsky, 2006). Factors that would specifically impact collegiate mental health may include role impairment due to home management/chores and school-related work (Alonso et al., 2018), academic distress (Pluut, Curşeu, & Ilies, 2015), homesickness (Thurber, & Walton, 2012), binge drinking (Cranford, Eisenberg, & Serras, 2012), sexual victimization (Griffin & Read, 2012), supportive college environment (Fink, 2014), and campus climate for students with diverse backgrounds (Mitchell, Reason, & Finley, 2019). Individual variances such as these college-specific dimensions as well as other general factors affecting mental health recovery may provide a better insight into the student recovery curves in the current sample.

The Addition of Psychiatric Care to Counseling and Primary Care Intervention
Research question 3 in this study investigated the efficiency of the counseling and primary care intervention with the addition of psychiatric care after controlling time and individual variance. The results of this study did not indicate a different therapeutic outcome for when psychiatric care was added to counseling and primary care intervention. Previous studies have shown that psychiatric care helps enhance therapeutic gain when it was added to a combination of primary care and behavioral care interventions (Bower et al. 2006; S Gilbody, Bower, & Fletcher 2006). The improvement of college students receiving psychiatric care in addition to counseling and primary care was not significantly different than the other two treatment groups.

Psychiatric care in integrated teams provides differential diagnosis and medication recommendations for individuals who are resistant to treatment (Norfleet, Ratzliff, & Chan, 2015). Psychiatrists in IPBH teams help consultees and clients understand potential drug-drug interactions and lead the treatment team for the latest evidence-based pharmacological treatments (Vanderlip, et al., 2016). Despite this expert-leadership role, it was noteworthy in the current study that students receiving an additional psychiatric care did not improve better than those who received counseling-only or counseling and primary care interventions.

Raney (2013) has identified psychiatrists’ role that would help them optimize their contribution to IPBH teams. Besides the client-level variables that were discussed previously, the skill set psychiatrists have in the treatment may have impacted the student recovery curves in the current study. For instance, knowledge about the population and ability to communicate with other professionals in the integrated care teams (Summers et al. 2014) are particularly important to take into consideration in collegiate mental health. The college student population has its own
characteristics in terms of their attitude to mental health and help-seeking behavior. For instance, personal stigma was found to be negatively associated with perceived need and use of psychotropic medication among college students (Eisenberg, Downs, Golberstain, & Zivin, 2009). Another study found that adolescents attempt to increase their autonomy as a developmental task creates a barrier to seek and receive help for their mental health problems (Wilson, & Deane, 2012). Reid and Wagner (2014) suggested that the ability to communicate in order to make shared decision-making is a key for treatment success in the integrated care teams. Lack of these competencies may have affected the therapeutic outcome in the current study.

**Implications of the Study**

Results of this study indicated that the collegiate IPBH program helped students with severe mental health symptoms improve their mental health regardless of the degree to which such health services were received. The final models in the analyses showed that all three treatment groups performed similarly in terms of their effectiveness. The counseling-only group was more efficient than the other two treatment groups. This difference accounted for 1.3% variance in the overall recovery among students. The primary care and psychiatric care interventions did not help students recover better or faster when they were added to counseling intervention. The results filled gaps in the current IPBH literature on college campus settings and provided meaningful practical implications for clinicians, campus policy makers, and researchers.

**Implications for Counselors and other Health Professionals in IPBH teams**

No single approach to collegiate mental health is sufficient to address increasing trend in the severity of mental health symptoms and number of students seeking help on college
campuses. The IPBH framework seems to provide better care for students with severe mental health symptoms in this study because no significant deterioration was observed in the treatment groups. Previous studies in routine counseling settings (Okiishi et al., 2002, 2006; Banham, & Schewitzer, 2016) showed that a large number of clients did not improve. Similarly, primary care interventions alone resulted in poorer outcomes than integrated care (Archer et al., 2012; Lenz, Dell’Aquila, & Balkin, 2018). All three treatment groups in this collegiate IPBH program in the current study exhibited positive growth. Students who presented with severe mental health symptoms reached a clinically score indicating no longer severe mental illness 28% the time at the time of discharge. The treatment groups did not differ in terms of the percentage of students who reached a clinically-significant score, as well. These results suggest that integrated health services in a college population would be an option to combat the issue with regards to the increasing trend in the severity of mental health symptoms and number of students seeking health services, although further studies focusing only on students with severe mental health symptoms are needed.

Communication and mutual professional understanding are keys for shared clinical decision-making in the integrated care teams (Reid, & Wagner, 2014). The results of the current study may have been affected by the quality of communication among the integrated team members. Professionals in interdisciplinary teams need to understand each other’s’ professional language and ways of practice to optimize services (Turner et al., 2018). Cohen et al. (2015) asserted that communication in integrated teams occurs through 3Cs: consultation, coordination, and collaboration. They suggested that health professionals working in these teams should equip themselves to execute all 3Cs for optimal outcome in integrated services. Counselors who are
part of integrated care teams on college campuses may participate professional activities organized by different college health professionals (e.g. American College Health Association) to improve inter-professional collaboration.

The dose-response relationship in counseling suggests that more treatment may not result in improved outcome (Hansen, Lambert, & Forman, 2002). Lambert et al. (2001) suggested that practitioners need to identify cases that are not improving for efficient case management. In the current study, most of the therapeutic gains were attributable to the first seven counseling sessions until students started exhibiting a quadratic trend in their recovery. Session by session measurement would help practitioners to identify cases who are not improving any further. These students may be referred to tertiary treatment options in the community (e.g. partial hospitalization). Students who reach clinical significance scores should also be identified if they start gaining no additional therapeutic benefit. They may be equipped with self-help tools before discharge through psychoeducation and referred to on-campus wellness-based programs if available.

Studies suggest that medication compliance is a major problem for students transitioning to college life (Gray et al., 2018; Schaefer et al., 2016). Gray and their colleagues (2018) found that only half of doses were taken as prescribed in a sample of college students. Counselors and other mental health practitioners in the collegiate IPBH teams should particularly pay attention to medication compliance. Recovery curves may have been influenced by non-compliance for students who are on medications in the current study. Taking medications as prescribed may be included as a behavioral goal in the treatment plan if students receive an additional primary care and/or psychiatric care service for their mental health issues. One study found that the use of a
medication reminder on smartphones may increase adherence to antidepressant medications in college students (Hammonds et al., 2015). Counselors may suggest such innovative ways to help students take their medications as prescribed.

The current study showed that counseling interventions in integrated care significantly contributed to the student recovery even when counseling was provided as a single treatment within a collegiate IPBH program. This suggests that the essential counseling skills such as active listening and empathy along with advocacy and social justice competencies would be valuable assets in integrated care teams counselors can bring to the table. Schmit, Watson, and Fernandez (2018) asserted that counselors in-training need to stay up-to-date about evidence-based treatment models in integrated healthcare systems. Similarly, Lenz, Dell’Aquila and Balkin (2018) suggested that counselor training programs may emphasize interdisciplinary provider roles within the context of biopsychosocial framework of client care to help ease the inclusion of counselor to the integrated care teams. It is important for counselors to keep their advocacy and social justice competencies with a wellness-based approach in integrated teams although they may need more training for their integration. A social justice and wellness-based perspective will help counselors retain their professional identity in integrated care teams.

**Implications for campus policy makers**

Results of the current study indicated that the collegiate IPBH program helped students with severe mental health symptoms improve significantly based on pre and post changes. More than a quarter of this improvement was clinically significant based on the clinical significance cut-off score for positive mental health on the GMHS. It should be noted that the selected sample constituted students with the most severe and complex mental health problems in the database.
although the diagnostic information was unknown. The current study supports the proposition to integrate primary care and behavioral care on college campuses for better collegiate mental health care.

Studies have shown that IPBH lowers healthcare costs (Satcher, & Rachel, 2017). Colleges are still financially challenged due to insufficient funding after the economic recession in 2009 (Mitchell, Palacios, & Leachman, 2015). College administrators need to find cost effective solutions to meet the high demand for mental health services (Hardy, Weatherford, Locke, DePalma, & D’luso, 2011). Student recovery curves showed that students receiving services in IPBH programs exhibited a consistent improvement over the course of seven counseling visits in all three treatment groups. Prior studies suggested that 13 and 18 sessions of counseling are required for 50% of individuals to improve (Lambert, 2013). IPBH may provide more efficient treatment leading the use of student services fee more efficiently for mental health needs.

The data in the current study included the years between 2011-2018. A majority of the participants in the current study is assumed to be from generation Z - people who were born from 1995 onwards. College administrators should be aware that they serve this new generation. Generation Z students have had exposed to more information than any other generation at their age through smartphones and internet access (Seemiller, & Clayton, 2019). This new way of acquiring information has affected consumer behaviors (Stillman, & Stillman, 2017) and health services may not immune from this new way of information gathering. Campus administrators need to provide innovative ways to access to health services across various platforms to keep them engaged. Keeping generation Z college students engaged with treatment for their mental
health issues will also be a challenging task for clinicians. Studies have shown promising outcomes for the use of mobile health for promoting wellness and delivering mental health interventions among college population (Johnson, & Kalkbrenner, 2017). Campus policy makers and clinicians need to adapt new technologies to communicate with generation Z students.

No single approach is sufficient to address the current increasing trend in the severity of mental health symptoms and number of students seeking help on college campuses. A systemic effort is needed on college campuses. Inclusion of public health approaches through early interventions, mental health issues can be addressed before they cause functional impairment (Mihalopoulos, McGorry, & Carter, 1999). This would help reduce the number of students seeking help in IPBH centers. In this way, practitioners can focus on more severe cases that would need immediate attention. Campus stakeholders involved in college student development should be a part of the community that promotes positive mental health. Campus administrators may develop outreach and co-curricular programs to address common issues on college campuses such as stress management, self, care, relationship conflicts, and alcohol/drug use (Parcover et al., 2015).

**Limitations of the Study**

This study is the first empirical analysis of the effect of a collegiate IPBH program on student recovery curves using routine care data. Such data evaluates counseling outcome and helps inform practice in counseling and related fields (Cade, Gibson, Swan, & Nelson, 2018). In addition, by integrating biopsychosocial model to investigate factors related treatment, the study makes significant contributions to IPBH and collegiate mental health research. However, no study is without limitations. Secondary data use and ex post facto design are limitations of the current study.
A single multilevel model was problematic to explain the growth trajectories for the entire sample because this data set included college students with a varying number of attended counseling sessions. For instance, the growth trajectories for students who attended six or less counseling sessions could be explained by a linear model whereas the growth of students who stayed in the treatment longer needs a quadratic component in the model. There was a maximum of 57 measurement points, but not every measurement occasion was given an equal chance of having been recorded due to the nature of the IPBH interventions in a non-experimental setting. 80.5% of measurement occasions in this data set were observed between the first and seventh session. A significantly large amount of the measurement occasions before the seventh session may have caused biased estimates in favor of the initial growth curves in the overall student growth trajectory although multilevel analysis is robust for calculating missing and erratic data (Bryk, & Raudenbush, 2002).

Another major limitation was the lack of information on the history of session trends across individuals. For example, treatment length (Baldwin, Berkeljon, Atkins, Olsen, & Nielsen; Hansen, Lambert, & Forman) and session frequency (Erekson, Lambert, & Eggett, 2015) have been identified in the literature as factors influencing therapeutic outcome. The number of counseling sessions participants received varied across individuals in the current study. Although the treatment length was included in the post-hoc analysis as an independent variable, this variable was not continuous but instead it was dichotomous (7 or less sessions versus 8 or more sessions). The session frequency that refers to the time intervals between sessions is also unknown.
Students who continued receiving treatment after the seventh session belonged to a cluster that showed a quadratic trend whereas students who left treatment before seventh session exhibited a linear growth. The counseling-only treatment group showed a linear trend and steeper increase than the other treatment groups between the first and sixth counseling sessions where 80.5% of measurements in this data set were observed. The recovery curves are quadratic and de-accelerated among students who stayed in treatment more than seven counseling sessions. This pattern may be expected to dominate the overall growth trajectory in the multilevel model analyses due to the nature of the dataset because students in the counseling only group spent less time in counseling based on the descriptive statistics. The counseling-only treatment group may have shown a greater improvement in the initial counseling sessions for this reason.

Another limitation of the current study is that BHM-20 is a self-report measure. Students may have been influenced by "social desirability," that is, they may have reported experiences that were considered to be socially acceptable or preferred. Also, the secondary data included aggregate scores for each subscale by participant, but not item by item responses. This limitation made it impossible to calculate Cronbach’s alpha for the current sample. Reliability statistics for the current sample could have made the current study stronger, although the BHM-20 was developed specifically for college populations.

**Recommendations for Future Study**

The current study raises further questions that scholars may be interested in investigating. First, while this research may have provided evidence regarding the effect of collegiate IPBH based on global mental health functioning, effect of the IPBH based on specific mental health issues (e.g. depression, anxiety, eating disorders etc.) remained unknown. Further research might
investigate clinical outcomes based on certain mental health symptoms and diagnoses. Also, comorbidity is common among college population (Anastopoulos et al., 2018) and additional understanding of the effect of IPBH on students with comorbid mental health conditions would be beneficial.

Second, although the overall IPBH program was effective, the current findings were somewhat contrary to past research suggesting that full implementation of IPBH (a combination of primary care and or psychiatric care with counseling) is superior to the least intense intervention (primary care) in the treatment of mood disorders. As previously mentioned, the difference in the current study was that the least intense intervention was counseling-only treatment. Why primary care and psychiatric care did not make a meaningful contribution to the student recovery curves remained unknown. A randomized study under controlled conditions using counseling-only treatment as a baseline treatment before primary care and psychiatric care interventions may help facilitate further understanding of the treatment effects.

Third, this study used secondary data and many individual level variables were not taken into account. Several individual level variables can be used in further studies as a large portion of the variance was unexplained in the growth trajectories. These individual variables may include role impairment (e.g., Sheehan Disability Scale; Leon, Olfson, Portera, Farber, & Sheehan, 1997), medication compliance, social functioning [e.g. Social Adaptation Self-evaluation Scale (SASS); Bosc, Dubini, & Polin, 1997], quality of life [e.g. Short Form Health Survey (SF-36, SF-12); Ware, Kosinski, & Keller, 1993], and client satisfaction for services, [e.g. Client Satisfaction Questionnaire (CSQ) Attkinson, & Greenfield, 2003]. Perceived family
support can also be assessed as family support found to be positively associated with college student mental health (Khallad, & Jabr, 2015; Sheets, & Mohr, 2009).

Finally, investigating conventional factors for counseling and primary care interventions may not work well within the IPBH paradigm. IPBH creates a new environment where clients perceptions of services would change fundamentally. The whole may be different from the sum of its parts. IPBH would have new dimensions separate than those that would be explained conventional factors in counseling and primary care. These differences can both have an impact in individual and systemic level predictors. When individuals enter the integrated healthcare systems, their perception of behavioral care and medical care would no longer be the same. Therefore, new variables peculiar to IPBH would come into play that affect the treatment outcomes. Future research should focus on assessing both individual and systemic level variances that are unique to IPBH systems.

**Summary**

This study contributes to literature on the treatment effects of a collegiate integrated primary and behavioral healthcare (IPBH) program among students with severe mental health symptoms using routine care data. The treatment effects were examined employing biopsychosocial framework. This framework provided an understanding of collaboration between various health professionals in treating mental health disorders.

Results of the current study found that the collegiate IPBH program was effective in improving global mental health among students with severe mental health symptoms. Findings also suggested that primary care and psychiatric care interventions do not make significant contributions to the student recovery curves when added to counseling. Although findings
supported the previous literature for the effectiveness of IPBH, the addition of primary care and psychiatric care interventions did not make significant contribution to the student recovery.

The current findings contribute to the college health and IPBH literature for the effectiveness of IPBH for the college student population. The study emphasizes the critical importance of addressing severe mental issues on college campuses in response to increased demand for services. This study’s findings enhance the general understanding of the individual and environmental factors related to targets’ reporting behavior. They highlight the critical importance of school personnel building positive and supportive relationships with students. Suggestions have been made for clinicians working in collegiate IPBH teams as well as college administrators. Additional randomized trials are needed to further confirm the results of the current study.
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