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**THE EFFECTIVENESS OF IMPLEMENTING A COLLABORATIVE MENTAL
HEALTH APPROACH ON QUALITY OF LIFE FOR INDIVIDUALS OF
LOW SOCIOECONOMIC STATUS**

A Master's Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Counseling

By

Tyler Zachary Tooley

May 2020

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THE EFFECTIVENESS OF IMPLEMENTING A COLLABORATIVE MENTAL HEALTH APPROACH ON QUALITY OF LIFE FOR INDIVIDUALS OF LOW SOCIOECONOMIC STATUS

Department of Counseling, Leadership and Special Education

Missouri State University, May 2020

Master of Science

Tyler Zachary Tooley

ABSTRACT

The ultimate purpose of this study is to provide insight and education to mental health clinicians, politicians and the general public of the numerous effects poverty has on mental health, in addition to the most beneficial ways to combat those insidious effects. The specific barriers met by individuals of low socioeconomic status severely affect psychological and physical health, as well as social and environmental relationships, which therefore diminish overall quality of life. The aim of this study is to examine the effectiveness of implementing a collaborative mental health approach for low income individuals on length of engagement in services and levels of depression, anxiety, and overall quality of life. There was a total of 447 participants, which consisted of 57.49% females ($n = 257$) and 42.51% males ($n = 190$). Participants were placed into one of three Treatment Groups based on their current level of care. Treatment Group 1 consisted of those who only had a case worker, case manager or social worker. Treatment Group 2 consisted of those who had a case worker, case manager or social worker and a psychiatrist or psychiatric mental health nurse practitioner. Treatment Group 3 consisted of those who had a case worker, case manager or social worker, a psychiatrist or psychiatric mental health nurse practitioner, and a therapist, counselor or psychotherapist. Results suggest that daily living (DLA-20) scores of overall functional ability tend to be higher, on average, within Treatment Group 3 than the other two treatment groups. Interestingly, depression was higher in Treatment Group 3 than the other two treatment groups, on average, but they also saw the fastest decline in scores of depression. The combination of therapy, psychiatry and case management services has demonstrated an overall improvement in daily living abilities with enhanced treatment duration. A combination of services might be necessary to address the unique needs of clients of low SES in an attempt to lessen or preclude the barriers that may prevent optimal quality of life.

KEYWORDS: mental health, socioeconomic status, quality of life, integrated care, biopsychosocial impact, depression, suicidal ideation, anxiety

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For the Degree of Master of Science, Clinical Mental Health Counseling

May 2020

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

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I dedicate this thesis to Benjamin Teacnum Smith.

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INTRODUCTION

According to the U.S. Census Bureau, in 2017 there were 39.7 million people living in poverty (Fontenot, Semga & Kollar, 2018). Individuals of low socioeconomic status (SES)—including those within poverty—are challenged with unique barriers that prevent the pursuit, access, affordability and success of physical and mental healthcare services. Income and education, among other things, can drastically affect the overall quality of life (QoL) of a person (Lubetkin, Haomiao, Franks & Gold, 2005). The specific barriers encountered by individuals of low SES severely affect psychological health, physical health, and social and environmental relationships, which therefore diminish overall QoL. Although a plethora of theories exist in examining the methods, interventions and approaches that address the unique barriers and other insidious effects of poverty, few studies have adequately examined the efficacy of implementing such things.

Inadequate and unhealthy housing and potential homelessness (Bassuk, DeCandia, Tsertsvadze & Richard, 2014), food insecurity (Messer & Ross, 2002), lack of access to transportation (Blumenberg & Agrawal, 2014), poor social support (Gazso, McDaniel & Waldron, 2016), and inadequate access to care services (Allen, Wright, Harding & Broffman, 2014) are but a few of the unique barriers individuals of low SES have encountered. Goodman, Smyth, and Banyard (2010) noted, “economic and material deprivation...create yet another layer of hardship, characterized by high stress, pervasive powerlessness, and social isolation and exclusion” (p. 4). Factors like economic and material deprivation are exponential contributors to emotional distress and QoL and should not be overlooked by mental health professionals, and “if we do not find ways to ameliorate these key mediators, we are significantly limiting our capacity

to improve the emotional well-being of impoverished communities” (Goodman et al., 2010, p. 4). Economic, social, mental and physical deprivation can be potentially life-threatening, and it can directly result in diminished QoL. Although it is important that mental health professionals are cognizant of clients’ socioeconomic statuses, it is imperative that each individual’s SES is addressed and challenged so that they may be provided the same opportunity for psychological growth from services as those with a higher SES. This concept could be considered “equitable mental health,” that is, ensuring mental health services are selectively provided in a fair and impartial manner so that no person is denied the right to adequate health services due to their race, ethnicity, sex, gender, sexual orientation, ability, or even their socioeconomic status.

In order for us to provide the necessary equity to individuals seeking mental health services, and to determine with accuracy and validity the efficacy of our attempts, we must be able to assess and determine not only their SES but also their quality of life. A number of factors determine the QoL of an individual. The World Health Organization (WHO) identified six broad domains, each with a number of subdomains, that are often utilized to measure an individual’s QoL: physical health, psychological health, level of independence, social relations, environment, and spirituality/religion (Division of Mental Health and Prevention of Substance Abuse, 1998, pp. 15-16). Additionally, the vicissitudes and fortunes in a person’s life, which fluctuate over time, can beneficially or detrimentally alter QoL.

Individuals with functional limitations sustain a substantially larger amount of mentally unhealthy days (Thompson, Zack, Krahn, Andresen & Barile, 2012). In addition, a diminished functional ability for daily living activities (DLAs) may result in, or be a result of, psychological and physical health struggles and may severely affect social and environmental relationships, which can also diminish overall QoL. Individuals who struggle with a functional limitation, as a

result of a physical, mental or emotional, or financial barrier, are likely to struggle within a therapeutic environment. Although little research is available to support this claim, when we look at the hierarchy of needs developed by Maslow (1970) we find a basic tenant that suggests individuals must first satisfy lower-level deficits before progressing to higher-level, cognitive growth (Figure 1). Basic, physiological needs, such as food, water, shelter, clothing, among other things, must first be present before individuals may reach higher-level needs, such as love and belongingness, esteem and other cognitive needs before eventually reaching a state of self-actualization.

Social workers and case managers tend to aid individuals in addressing basic, physiological and safety needs, which may include food insecurity, poor housing or utility shut-offs, domestic violence, or inadequate education or healthcare access, through community-based interventions, by utilizing food banks, obtaining financial, legal or healthcare aid, and assisting in pursuing or accessing other services or assistance. Psychiatrists and psychiatric mental health nurse practitioners, through the use of prescription medications, tend to address love and belongingness, esteem, cognitive and aesthetic needs by altering levels of neurotransmitters within the brain. Neurotransmitters are responsible for: altering the ability to receive and give love, affection, trust and acceptance; establishing a sense of competence, self-esteem and respect; satisfying innate desires for curiosity, exploration or meaning; and, finding order and balance within life and the surrounding world, especially when paired with psychotherapy (Mintz, 2006). Although medications may facilitate or enhance the ability to experience such things, it does not provide the necessary resources to independently maintain those, to correct other cognitive, emotional or environmental deficits, to resolve and develop interpersonal and communication problems, or to achieve self-actualization. Therefore, a combination of services

might be necessary to address the unique needs of clients of low SES in an attempt to lessen or preclude the barriers that may prevent attaining a sense of self-actualization.

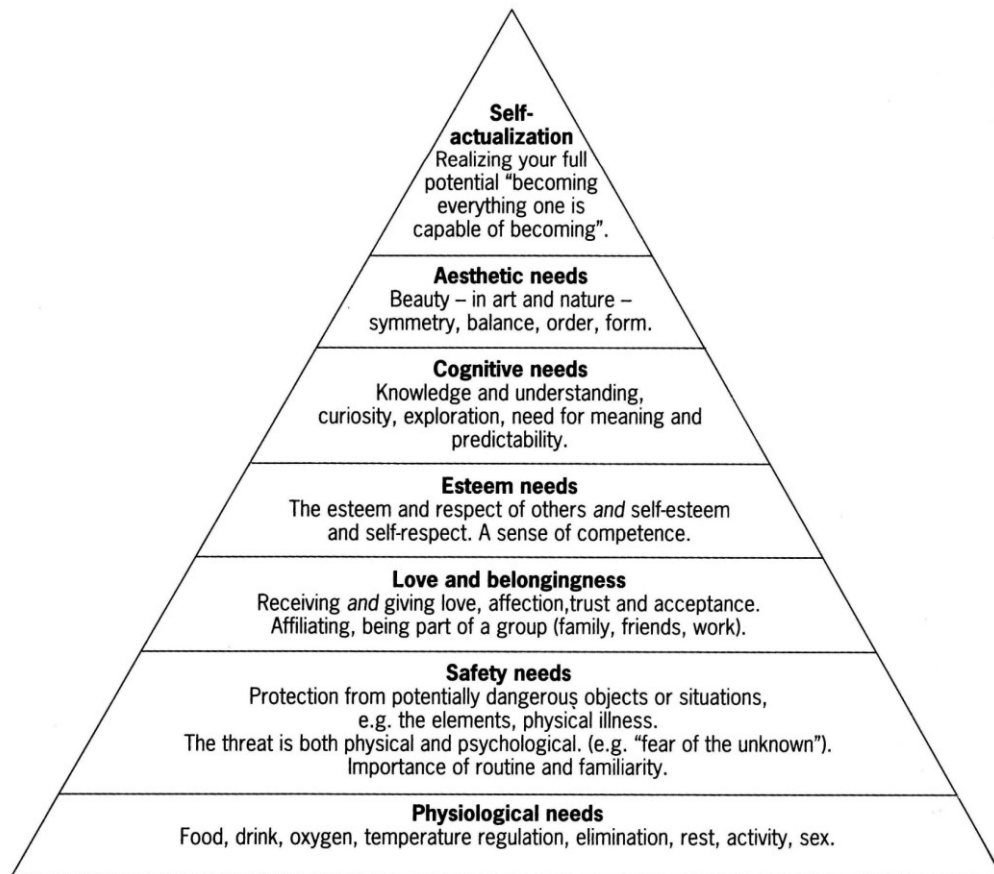


Figure 1. Maslow's Hierarchy of Needs

The barriers and insidious effects of low SES can be addressed through a variety of methods in healthcare. A number of research studies have identified various interventions, strategies, and care pathways to address the particular issues, challenges and barriers of individuals with poor QoL. The Primary Care Behavioral Health (PCBH) model creates opportunities for behavioral health providers to deliver direct services to the community through primary care practices and has demonstrated improved outcomes in depression when access to

behavioral health care is more available (Landis, Barrett & Galvin, 2013). Similarly, Complex Care Management (CCM) is an alternative approach that provides an interdisciplinary team of clinical healthcare members. CCM has improved health-related motivation, aided in establishing a sense of control, and demonstrated the importance of relationship-centered models in treating low-income individuals (Mao, Willard-Grace, Dubbin, Aronson & Fernandez, 2017). Lastly, Clinical Case Management, also known as Community-Based Rehabilitation (CBR) or Community Psychiatric Rehabilitation (CPR), services have also been utilized to aid in addressing the specific challenges and barriers of individuals of low SES who suffer a serious mental illness, by providing services that improve access to, and utilization of, various community resources (Cook & Mueser, 2015; Deimling Johns, Power & MacLachlan, 2018).

Information regarding the unique barriers encountered by individuals of low SES, factors that determine an individual's quality of life, the biopsychosocial effects of low SES and poor quality of life, and methods and interventions to address the aforementioned are explored within this thesis in addition to the efficacy of such implementations.

Primary Research Question

Does the quality of life (QoL) of individuals of low socioeconomic status (SES) differ according to their placement in one of three progressively more involved treatment groups (Group 1: case management; Group 2: case management and psychiatry; or, Group 3: case management, psychiatry and psychotherapy)?

Hypothesis

- Hypothesis 1: scores measuring daily living activities for Group 3 will be higher than that of Group 2, and scores from Group 2 will be higher than that of Group 1,

therefore suggesting a difference in functional abilities, and therefore quality of life, as a result of the treatment approach.

- Hypothesis 2: scores measuring depression and anxiety will demonstrate lower scores within Group 3 than Group 2, and lower in Group 2 than Group 1, therefore suggesting a difference in severity of depressive, anxious and suicidal symptoms, and therefore quality of life, as a result of the treatment approach.
- Hypothesis 3: Group 3 will have the highest overall improvement in quality of life and duration of treatment, while Group 2 will demonstrate more improvement than Group 1 but not Group 3.

Key Terminology

- Poverty: households receiving at or below the income thresholds according to the U.S. Census Bureau; the state of being extremely poor or having inferior quality of life.
- Quality of Life (QoL): a standard of health, comfort, and happiness experienced by an individual or group, assessed through a combination of measures.
- Socioeconomic Status (SES): the social standing or class of an individual or group, often measured as a combination of education, income and occupation.
- Collaborative Mental Health Approach: the integration and simultaneous utilization of various levels of mental health care providers: case management or social work, therapy or psychology, and psychiatry or medication management.
- Community Psychiatric Rehabilitation Center (CPR-C): a program designed to increase a person's quality of life by providing an array of services that assist in supporting a stable and productive lifestyle through community support, crisis intervention, medication services, and rehabilitation.
- Certified Community Behavioral Health Clinic (CCBHC): an initiative to expand access to mental health and addiction care in community-based settings.
- Healthcare: the industry, facility or system that facilitates the delivery of health care for patients.
- Health care: the act of improving the health of a patient.

LITERATURE REVIEW

Biopsychosocial Effects

Individuals of low socioeconomic status (SES) are challenged with specific barriers preventing them from seeking, accessing and affording physical and mental healthcare services. Poverty and low SES have an insidious correlation with a myriad of chronic physical and mental health conditions, including depression (Falconnier & Elkin, 2008; Siefert & Bowman, 2000), anxiety (Vine, Stoep, Bell, Rhew, Gudmundsen & McCauley, 2012; Zvolensky, Paulus, Bakhshaie, Viana & Garza, 2017), angina (Alam, Naqvi & Aslam, 2016), stroke (Engels, Baglione, Audibert, Viallefont, Mourji & El Alaoui Faris, 2014; Tang et al., 2015), heart failure (Hawkins, Jhund, McMurray & Capewell, 2012), coronary heart disease (Alam et al., 2016; Tang, Laskowitz, He, Østbye & Bettger, 2015), pulmonary hypertension (Talwar, Sahni, Talwar, Kohn & Klinger, 2016), increased overall allostatic load, which can lead to atherosclerosis, myocardial infarction, cardiovascular disease, diabetes and obesity, emotional dysregulation (Adler & Snibbe, 2003; Brody, Yu, Chen, Kogan & Beach, 2013; Gallo & Matthews, 2003; Hawkey, Lavelle, Berntson & Cacioppo, 2011; McEwen & Gianaros, 2010; Stein Merkin, Karlamangla, Diez Roux, Shrager & Seeman, 2014; Talwar et al., 2016), overall health decline (Fritzell, Nermo & Lundberg, 2004), quality of life (Mielck, Vogelmann & Leidl, 2014; Zhang & Xiang, 2019), and even multi-morbid outcomes (Arokiasamy, Uttamacharya, Jain, Biritwum & Yawson, 2015). In a thorough literature review, McEwen & Gianaros (2010) posited that when adversity, whether real or implied, arises and threatens an individual's safety, "physiological responses of the autonomic nervous system, cardiovascular, metabolic, and immune systems lead to protection and adaption of the organism" (p. 194). Constant adaption to

adversity requires individuals to place their health and happiness in a vulnerable state, for these stress mechanisms can lead to long-term dysregulation and can “promote maladaptive wear-and-tear on the body and brain under chronically stressful conditions” (p. 190).

Biological. Quality of life (QoL) is often impaired concurrently with impairment of physical health, something Mielck et al. (2014) referred to as a “double burden” (p.12). As health declines, especially related to socioeconomic status, quality of life follows. Studies outlining the biological risks and poor physical health outcomes associated with low SES and poverty are copious; several are noted below.

Cardiovascular Risk. Considerable evidence suggests a link between socioeconomic stressors cardiovascular issues. Exposure to stress activates the sympathetic nervous system (SNS) via the central nervous system (CNS), therefore initiating a stress response. The hypothalamic pituitary adrenal (HPA) axis is responsible for the neuroendocrine reactions of a stress response. After myriad physiological functions, the adrenal cortex is stimulated and releases cortisol. Activation of HPA and SNS modulates important mediators in the immune response, by altering the release of hormones such as cortisol, epinephrine, and norepinephrine (Chrousos, 2009). “Sustained cortisol response can lead to increases in risk factors for cardiovascular disease (CVD) such as insulin release, obesity, increased lipid accumulation, coagulation, and hypertension” (Aiello & Kaplan, 2009, p. 190). Excessive stress reactions can lead to a myriad of negative biological and physiological altercations, therefore supporting the claim that low SES is correlated with poor health outcomes. In addition to CVD and other cardiological implications, research suggests other health impairments and risks associated with a low SES lifestyle.

Lifestyle choices made by people of low SES alter their overall physical health. In a notable literature review, Kaplan & Keil (1993) noted that the “promotion of products associated with increased risk of cardiovascular disease seems to be targeted toward lower-SES groups” (p. 1993). The researchers suggested that products associated with poor physical health outcomes are often marketed directly towards individuals of low SES, and due to limited resources, many individuals often have no alternative product choices. Additionally, their research identifies a substantial body of evidence suggesting a consistent relation between SES and “the incidence and prevalence of cardiovascular disease, secular trends in cardiovascular disease, the prevalence of cardiovascular risk factors, and access to high-quality care and diagnostic services” (p. 1993). Similarly, from another prominent study by Hawkins et al. (2012), the researchers noted that, “Adverse cardiovascular risk factors and coronary heart disease are unequivocally associated with lower SES” (pp. 143-144). A multitude of research supports the claim that individuals of low SES tend to suffer from cardiovascular issues and other cardiological risks, because of limited resources, poor or inadequate healthcare services, and even marketing campaigns.

Stroke. Low SES not only has cardiovascular implications, but cognitive and cerebral ones as well. A study conducted in Morocco confirmed a “significant association between socioeconomic status and prevalence of stroke” (Engels et al., 2014, p. 9), which suggests individuals with the highest risk of stroke are those who are most deprived. Another study noted that differences in SES along the entire life course “may explain socioeconomic differences in stroke risk in adulthood” with evidence of “an increased risk for developing stroke among those who experience worse socioeconomic conditions in childhood independent of their adult life circumstances” (Addo, Ayerbe, Mohan, Crichton, Sheldenkar, Chen Wolfe & McKevitt, 2012, p. 1190). This posits that lower SES as a child can severely impact overall health while growing

into adulthood. It is evident that the volatile physical health issues found within low income populations exceed the bounds of time, nationality, culture, and age.

Hypertension. Talwar et al. (2016) found that, “Patients with low SES have more advanced pulmonary hypertension (PHTN) and pulmonary arterial hypertension (PAH) at time of diagnosis than patients with higher SES” (p. 194), which is likely related to a more advanced disease state at the time of initial diagnosis. The detrimental effects of reduced access to physical healthcare systems by individuals of low SES is reiterated by this study. Pulmonary arterial hypertension is a devastating form of PHTN characterized by “progressive increases in pulmonary vascular pressure and pulmonary vascular resistance that may eventually lead to right ventricular failure and death” (p. 191). Death can be the result for countless individuals who struggle to address physical health issues created by economic inequality and the financial distress of poverty.

Multimorbidity. Poverty has a greater impact in lowering scores of health-related quality of life than diabetes, asthma, high blood pressure, heart disease, stroke, and emphysema (Lubetkin et al., 2005), which only highlights the pervasive effects of low SES and poverty. A study conducted in 2015 analyzed the relation between low SES and eight chronic diseases, including angina pectoris, arthritis, asthma, chronic lung disease, diabetes mellitus, hypertension, stroke, and low visual acuity, and the researchers found that the “prevalence of multimorbidity was lower in higher levels of education, demonstrating overall correlation of low SES with multimorbidity” (Arokiasamy et al., 2015, p. 9). Lower levels of education and lower levels of socioeconomic wealth are correlated with detrimental multimorbid outcomes, suggesting individuals of low SES are at a greater disadvantage in maintaining higher levels of QoL to serious implications in physical health and wellbeing. Multimorbidity is associated with adverse

health outcomes and has serious health care implications. Patients of multimorbidity are at higher risk of iatrogenic disease and fragmentation of care because treatment is often only focused on one chronic condition (Arokiasamy et al., 2015). A high correlation between SES and multimorbid physical health complications exists, according to the noted research, and the management of multimorbidity is likely to become a challenge for health care providers everywhere. It is imperative that physical health outcomes, including multimorbidity, are addressed within populations of low SES in mental healthcare.

Psychological. A multitude of psychological dysfunctions exist in correlation with low SES, and the psychological outcomes of individuals of low SES are often detrimental as a result of the barriers they face. These outcomes may include: depression, emotional dysregulation, poor coping skills, and even suicidal ideations.

Depression. Depression is highly correlated with low SES due to several factors. Individuals of low SES often lack peer and social support, and a multitude of research has suggested “a sense of community and connection to one’s peer group may be particularly important in recovery from depression” (Ali, Hawkins, & Chambers, 2010, p. 31). Human connection is an imperative construct to our theoretical conception and comprehension of depression, among other disorders. Ali, et al. (2010) examined a community-based program that has “economic empowerment as its central aim,” where the results indicated that this program “may indeed play a role in recovery from depression” (p. 31). This study further supports the premise that connection and community support are two factors that promote positive psychological outcomes—both things that individuals of low SES often lack. Research consistently supports epidemiologic theories of the social production of disease and the depressive effects of social and environmental stressors (Siefert & Bowman, 2000).

Anxiety. Social and environmental stressors, including exposure to adverse social environments, discrimination and structural disadvantage, such as crowding, neighborhood crime, pollution, economic hardship, and exposure to classism or institutionalized racism, are stressors that affect not only the individual but also the family and others around them. Economic strain can impair effective coping strategies among younger individuals (Vine et al., 2012), suggesting that “economic conditions may interfere with the development and or utilization of efficacious management of stress” (p. 829). Such economic strain is likely to be associated more strongly with “certain subtypes of anxiety reactions than others” (Vine et al., 2012, p. 828).

Emotional Dysregulation. The emotional dysregulation of children, adolescents and adults who are of low SES has numerous disparaging psychological outcomes, often associated with “depressive, suicidal, anxious arousal, social anxiety, and anxiety/depressive disorders via emotional dysregulation” (Zvolensky et al., 2017, pp. 693-694). A variety of poor mental health outcomes are a direct result of emotional dysregulation, which is associated with low SES. Therefore, addressing low SES has the potential to generate immeasurable positive effects on mental health within those communities. Psychological disorders can continue to persist among individuals of low SES without proper treatment. Falconnier & Elkin (2008) noted in a study, “[neglecting] the economic stressors associated with depression...can affect the ongoing course of depression” (p. 44). It is imperative that mental health providers respond to the economic and social stressors of low SES to improve psychological outcomes.

Social. Access to healthcare is limited for individuals of low SES as a result of financial burden. The rising costs of medications and the affordability of maintaining those medication regimens, transportation costs associated with travel to and from visits, paired with increasing

comorbidity and rising dependence on secondary care, create an incomparable hurdle.

Additionally, the struggle to overcome such hurdles is exacerbated by impaired health literacy, education and social support of individuals of low SES, paired with an already existing struggle in medication compliance, proper diet and other lifestyle barriers. Unfortunately, a physician's perception of these disadvantages has the potential to keep individuals from receiving effective care (Hawkins et al., 2012). Inadequate mental and physical healthcare treatment is likely a result of stigma and classism. Smith (2005) indicated that "poor people have again receded into the background of psychological concern" (p. 690), which would call for cultural awareness and competence concerning classism of health providers.

In all, the biopsychosocial effects of low SES create unique, arduous barriers making the access and utilization of mental health services improbable. Additionally, the notion that exposure to biopsychosocial stressors is linked with morbidity and mortality has been recognized throughout history (Aiello & Kaplan, 2009; Sternberg, 1997), only highlighting the importance of addressing such things within low SES populations.

Specific Barriers and Challenges

Inadequate and unhealthy housing as well as homelessness, or potential homelessness, is but one category of barriers individuals of low SES encounter (Bassuk et al., 2014). Poor living environments, or the absence of a suitable living environment, as a result of low SES, diminish and reduce individuals' capacity to manage stress, therefore perpetuating further physical, emotional and cognitive vulnerabilities (Gallo & Matthews, 2003). Secondly, food insecurity (Messer et al., 2002) is another obstacle that creates additional strain for those individuals who might be seeking mental health treatment. A person who is without access to adequate food

supplies lacks the nutrition and sustenance for cognitive or emotional gain, which is a fundamental characteristic of Maslow's hierarchy of needs (Maslow, 1954). Other facets relative to the specific barriers and challenges of individuals of low SES include: lack of access to transportation (Blumenberg & Agrawal, 2014), poor social support (Gazso et al., 2016), and inadequate access to care services (Allen et al., 2014).

Individuals of low SES who pursue mental health treatment(s) often struggle to research and discover available and appropriate providers due to limited access to resources. Even if an individual of low SES had access to such resources, other barriers would still likely be present: access to means of transportation to and/or from mental health services, access to financial resources to afford mental health treatments, and much more. For the few individuals who manage to obtain the resources and aid necessary to overcome those barriers and challenges, they will still face obstacles within their mental health services which cannot be overcome until their socioenvironmental and socioeconomic status are enhanced. The specific barriers met by individuals of low SES severely affect psychological and physical health, as well as social and environmental relationships, which therefore diminish overall QoL.

Quality of Life

QoL can be determined by a number of factors, including "physical health, psychological health, personal beliefs, social relationships, and their relationships to salient features of their environment" (Division of Mental Health and Prevention of Substance Abuse, 1998), and income and education can significantly affect overall quality of life (Lubetkin et al., 2005). One measure used in a variety of settings is the World Health Organization Quality of Life (WHOQOL) assessment. The instrument is used to assess an individual's perception of their

position in life, regarding a multitude of areas, noted above. A multi-dimensional profile of scores across domains and sub-domains of quality of life is subsequently provided by the instrument. Research on the WHOQOL assessment has suggested that physical domains contribute most to explaining overall QoL in individuals (Division of Mental Health and Prevention of Substance Abuse, 1998). In addition to the WHOQOL, other indirect assessments and evaluations are available to aid in determining the QoL of an individual.

The Daily Living Activities (DLA) functional assessment was designed to assess the daily living areas impacted by mental illness or disability and can define outcomes or specific deficits that are needed for clinicians to include within individualized treatment plans (ITPs). The DLA has proven to be valuable in treatment planning and in estimating Global Assessment of Functioning (GAF) (Presmanes, n.d., p. 1). A GAF score supplies information concerning the overall psychological condition of an individual through Likert scales examining educational, social, relational, and occupational conditions present. In essence, the DLA and its GAF-score can provide clinicians with insight concerning the QoL of patients.

The diminished QoL of individuals of low SES, as a result of poor physical and psychological health, social and environmental encumbrance, and other unique barriers, can lead to insidious effects. Such barriers and effects can be addressed through a variety of methods in healthcare.

Interventions & Strategies

A number of research studies have identified various interventions, strategies, and care pathways to address the particular issues, challenges and barriers of individuals of low SES. Integrated Collaborative Care (ICC) and its various models, such as the Primary Care Behavioral

Health (PCBH) model, have demonstrated effectiveness in “augmenting the delivery of health care services” by creating the opportunity for behavioral health providers to deliver direct services to the community through primary care practices (Maragakis, Lindeman, & Nolan, 2018, p. 432). The PCBH model has also demonstrated improved outcomes in depression when access to behavioral health care is more available (Landis et al., 2013). Similarly, Complex Care Management (CCM) is an alternative approach in supporting patients with complex medical issues, through providing an interdisciplinary team of primary care physicians (PCPs), behavioral health providers (BHPs) and other collaborative team members, and it has demonstrated improved health-related motivation, aided in establishing a sense of control, and has also demonstrated the importance of relationship-centered models in treating low-income individuals (Mao et al., 2017). Lastly, Clinical Case Management, also known as Community-Based Rehabilitation (CBR) or Community Psychiatric Rehabilitation (CPR), services have also been utilized within the previously mentioned models to aid in addressing the specific challenges and barriers of individuals of low SES, by providing services that improve access to, and utilization of, resources (including shelter, food, and financial resources), and through assisting with care coordination, advocacy, informal counseling and behavioral support services, and other means of treatment to address those specific barriers (Cook & Mueser, 2015; Deimling Johns et al., 2018).

A group of researchers compared the efficacy of cognitive-behavioral group therapy, clinical case management, and their combination, as a treatment for depression among older adults of low income (Areán, Gum, McCulloch, Bostrom, Gallagher-Thompson & Thompson, 2005). The researcher found that disadvantaged older adults with depression “benefit from increased access to social services,” and suggested that psychotherapists, “augment their

practices with social service interventions, such as clinical case management, when working with financially strained” (p. 601). Additionally, Goodman et al. (2010) identified “stress, powerlessness, and social isolation” as primary targets for clinical interventions to “mediate the relationship between poverty and emotional distress” within their identified population (p. 3). Notably, the following is asked: “What might collaboration between mental health professionals and community-based programs yield?” (p. 5). This study denotes an imperative endeavor we must confront: the need to develop methods of addressing the mental health needs of impoverished communities.

Although a plethora of research exists on examining specific barriers and their relative physical, physiological and psychological health ramifications, little research is available on identifying, implementing, and evaluating the benefits of a collaborative mental health approach to improve the overall quality of life of individuals of low socioeconomic status. The purpose of this study is to examine the efficacy of implementing a collaborative mental health approach targeted at low income individuals on levels of depression, anxiety, and overall quality of life.

METHODS

Participants

All participants were part of a Community Psychiatric Rehabilitation Center (CPR-C) program from a state-contracted Community Mental Health Clinic (CMHC) that has assisted more than 40,000 clients across 17 counties in a midwestern state, and authorization to obtain information was obtained from the organization (Appendix B). The organization, piloting a new funding model for Medicaid known as the Certified Community Behavioral Health Clinic (CCBHC), provides individual therapy, group therapy, psychiatry, addiction recovery and rehabilitation, and case management services to adults, as well as a myriad of other services to children and families. The CCBHC program is a three-year exploratory phase established in 2016 by the Excellence in Mental Health Act, sponsored by the U.S. Senate by Missouri Senator Roy Blunt, which provides organizations like the one used here with the resources to begin incorporating basic medical and dental services into mental health agencies to enrich healthcare delivery and improve overall population health management.

Qualification. The CPR-C program requires individuals to have an active Medicaid healthcare plan. Participants must be enrolled within this program at the organization to ensure qualification of the label “low socioeconomic status” and for the validity of the study. According to the Missouri Department of Social Services (Missouri Department of Social Services, 2018), individuals may be eligible for one of 14 programs within MO HealthNet (Missouri Medicaid) as long as they:

- I) are elderly (65 and older), blind, or permanently and totally disabled, as defined by the Social Security Administration as being unable to gainfully and substantially be employed for one year longer due to a physical or mental incapacity;

- II) have a net income less than the monthly threshold for an individual or a couple;
- III) live in Missouri and intends to remain;
- IV) are a United States citizen or an eligible qualified non-citizen;
- V) own cash, securities, or other total non-exempt resources with a value of less than the resource threshold for an individual or a couple; and,
- VI) are not a resident of a public institution except a public medical institution.

Each program within MO HealthNet has specific income guidelines; however, the sample population includes only individuals who are enrolled in the MO HealthNet for the Aged, Blind, and Disabled (MHABD) Non-Spenddown program as well as the MHABD Spenddown program. The net income limit for elderly and disabled is 85% of the federal poverty level. For individuals, threshold is an \$860 income limit per month; couples, \$1,166. The net income limit for blind individuals is 100% of the federal poverty level. For individuals, \$1,012 income limit per month; couples, \$1,372. All eligibility requirements for MHABD Spenddown are the same as MHABD Non-Spenddown, except there is no income maximum. Each month the individual must meet a spenddown, or premium, equal to the amount by which the income exceeds the non-spenddown limit. The spenddown may often be met by incurring medical expenses or paying in to MO HealthNet Division.

Selection. Data obtained from the organization to aid in the selection and categorization of participants included:

- I) the length of time each client was enrolled in the Community Psychiatric Rehabilitation Center (CPR-C) program,
- II) the presence, duration, and frequency of visits for current or prior clients who worked with the following classifications of providers:
 - i) a therapist, counselor or psychologist; and/or,
 - ii) a case worker, case manager or social worker; and/or,
 - iii) a psychiatrist or psychiatric mental health nurse practitioner;
- III) Daily Living Activity-20 (DLA-20) ratings, including Global Assessment of Functioning (GAF) and Modified GAF (mGAF) scores, as well as results from the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder (GAD-7) form, and the Columbia Suicide Severity Rating Scale (CSSRS); and,

- IV) individual demographics, which included age, race or ethnicity, and gender or sex.

Treatment Groups. To examine psychological outcomes, participants were sorted into three treatment groups as outlined below:

- Treatment Group 1 (Case Management Only): individuals who worked only with case workers, case management or social workers;
- Treatment Group 2 (CM and Medication Management): individuals who worked with case workers, case management or social workers as well as psychiatrists or psychiatric mental health nurse practitioners simultaneously; and,
- Treatment Group 3 (CM, Psychiatry and Psychotherapy): individuals who worked with case workers, case management or social workers, psychiatrists or psychiatric mental health nurse practitioners, and therapists, counselors or psychotherapists.

Procedures

Authorization from the Institutional Review Board (IRB) was obtained prior to beginning the study (Appendix A) and was approved on January 13, 2020 (IRB-FY2020-436).

Consequently, upon approval, authorizations were obtained from the organization in which the data was collected (Appendix B) as well as the Missouri Department of Mental Health (Appendix C). The current study utilized a case-control, Ex-Post Facto design. After accessing the de-identified data, information was selected, sorted and matched into three unique treatment groups. Because of the nature of the study, participants were not randomly assigned to groups nor were they selected using randomization. By identifying relationships between the variables, we retroactively examined the effects of a naturally occurring event on a subsequent outcome to establish a causal or correlational link between them. To determine whether collaborative mental healthcare plays a role in altering the mental health outcomes of individuals, we will compare the results of the three treatment groups to one another. Treatment Group 1, where only a case manager, case worker or social worker is utilized by the client, will be classified as the control

group. Additionally, we examined and identified correlations between various factors, including individual demographics, length of time within programs, and other variables.

Measures

Data from the DLA-20, GAF, GAD-7, PHQ-9, and CSSRS was collected; each measure provided unique information relating to the variables of interest. Each measure, outlined below, included information on development, application, reliability and validity, and the specific variable each identifies relating to this study.

The Daily Living Activities-20 (DLA-20). The Daily Living Activities-20 (DLA-20) measures the daily living areas impacted by mental illness or disability and supports the functional assessment data needs of service providers. It is a brief functional assessment tool, integrated nationally and appropriate for individuals ages 6 and up, regardless of diagnosis, disability, or cultural background. It contributes valuable information for Medicaid reimbursement and healthcare reporting standards. The DLA-20 ensures valid scores and consistent utilization for healthcare report cards (Presmanes, n.d., p. 2). MTM Services, a comprehensive consulting firm partnered with the National Council of Behavioral Health, noted in a publication that the Patient Protection and Affordable Care Act has “accelerated the realignment of healthcare payment systems so that providers are reimbursed based more on the value of their care than on volume” (Presmanes, n.d., p.1). Reliable and valid outcome measures generated by the DLA-20 enable providers to accurately report on the value of care they are providing based on the improvement within the QoL of the patients.

The DLA-20 identifies where outcomes are needed and therefore is critical for effective treatment planning. The DLA-20 measures improvement in functioning, quality of life, and

value of care instead of symptomology, and it identifies needs that are priority for recovery and aid in developing outcomes, goals and objectives within treatment plans. The score measures 20 different areas of living, including but not limited to, coping skills, time management, nutrition, family relationships, safety, alcohol and drug use, mental and physical healthcare practices. Each of these areas is rated on a Likert scale of 1 to 7 (extremely severe functional impairment needing pervasive supports to functioning optimally and independently and does not need any support services, respectively).

The DLA-20 was originally developed for use by behavioral health care providers to identify the specific needs of clients with severe mental illness. Additionally, the measure can “effectively complement client self-report measures of symptomology, functioning, and quality of life to provide useful data to support effective and accountable service delivery,” according to researchers Scott & Presmanes (2001). Results from the study have indicated that this scale has adequate internal consistency ($\alpha = .97$) and interrater reliability (interclass correlation coefficient = .83) (Scott & Presmanes, 2001). Additionally, analysis of variance (ANOVA) of DLA scores within this study was conducted, and a statistically significant ($p < .05$) validity coefficient provided support for convergent validity ($F = 6.21, p < .001$), suggesting the DLA-20 adequately and effectively measures daily living activities.

GAF and mGAF. The Global Assessment of Functioning Scale (GAF) is a widely used measure of level of impairment associated with emotional disturbance (Scott & Presmanes, 2001). GAF is intended to be a “generic rather than a diagnostic-specific scoring system” and measures patient’s psychological, social, and occupational functioning. Additionally, it covers the range from positive mental health to severe psychopathology. Scores on this scale range from 0 to 100 and represents an overall level of functioning on a continuum from severe

disability to superior functioning. Research on the original GAF has suggested poor reliability and validity due to the natural subjectivity of the scale's use in assessment by evaluators, which contradicts findings noted regarding the DLA. A study examining the scale found that inter-rater reliability between routine scores ($r = .39$) and research scores ($r = .59$) were low (Vatnaland, Vatnaland, Friis & Opjordsmoen, 2007). Researchers from a similar study found that “assessors may rate psychiatric impairments according to their own experience and attitudes,” and suggested an element of subjective judgment, and that different professions often assign different scores: “the scores can be influenced by disagreement on the criteria for rating, lack of training, or problems related to the intrinsic properties of the GAF itself” (Aas, 2011).

Alternatively, the modified Global Assessment of Functioning (mGAF) scale has more detailed criteria and a more structured scoring system than the original GAF. Research on the validity and reliability of the mGAF suggested: intraclass correlation coefficients for admission GAF scores are higher for raters who used the mGAF (.81), compared to raters who used the original GAF (.62); validity shows a high correlation (.80) between the two sets of scores; and, the mGAF may be more resistant to rater bias due to increased structure of the scale (Hall, 1995).

GAD-7. The Generalized Anxiety Disorder Scale-7 (GAD-7) is a 7-item, self-rated scale which aids in determining the severity of Generalized Anxiety Disorder (GAD). The original validation of the GAD-7 demonstrated excellent internal consistency ($\alpha = .92$), good test-retest reliability (interclass correlation = 0.83), criterion, factorial, and procedural validity (interclass correlation = .83) (Spitzer et al., 2006). A cutoff score of 10 was identified as the optimal point for sensitivity (89%) and specificity (82%) was noted in the same study.

Scores on a Likert scale of 0 to 3 are assigned to the response categories, “not at all,” “several days,” “more than half the days,” and “nearly every day,” respectively, for each of the

seven symptom areas. The total score for the GAD-7 ranges from 0 to 21, and scores are representative of the severity of GAD symptoms: mild (5-9), moderate (10-14), and severe (15-21). The GAD-7 was designed primarily as a screening and severity measure for generalized anxiety disorder, but it has been found to have moderately good operating characteristics for panic disorder (sensitivity 74%, specificity 81%), social anxiety disorder (sensitivity 72%, specificity 80%), and post-traumatic stress disorder (sensitivity 66%, specificity 81%) (Spitzer, Kroenke, Williams & Löwe, 2006). When screening for anxiety disorders, further evaluation is recommended for scores 10 and over.

PHQ-9. The Patient Health Questionnaire (PHQ-9) is a 9-item scale that establishes a depressive disorder diagnosis as well as a depressive symptom severity grade. Scores from 0 to 3 are assigned to the responses of, “not at all,” “several days,” “more than half the days,” and, “early every day,” respectively. The total PHQ-9 score ranges from 0 to 27. Scores of 5, 10, 15, and 20 represent the guidelines for determining severity of depression: mild, moderate, moderately severe and severe depression, respectively. Kroenke, Spitzer, & Williams (2001) analyzed the construct validity, criterion validity, sensitivity (88%) and specificity (88%) of the measure. They concluded the scale as a, “reliable and valid measure of depression severity” that makes it a, “useful clinical and research tool.” Internal reliability of the PHQ-9 was excellent (Cronbach’s $\alpha = .89$); test-retest reliability was also excellent (Kroenke et al., 2001).

C-SSRS. The Columbia-Suicide Severity Rating Scale (C-SSRS) supports suicide risk assessment through a series of simple, plain-language questions. The assessment aids in identifying whether an individual is at risk of suicide, assesses the severity and immediacy of the risk, and gauge the level of support that the person needs. The measure is regarded as a “standard measure for measuring suicidal ideation and behavior in clinical trials” by the Food

and Drug Administration and adopted and recommended by the Centers for Disease Control and Prevention for data collection; the measure has ample supportive research for: predictive or incremental validity; sensitivity to change; sensitivity and specificity; positive and negative predictive value; internal consistency; inter-rater and multi-method agreement; factor analysis of internal structure; convergent validity and accuracy; divergent and discriminant validity; and, cross-cultural validations (The Columbia Lighthouse Project, 2019).

Analysis and Evaluation

Data for each variable, PHQ-9, DLA, GAD-7, and CSSR-S, was provided by the organization in separate Excel files. Each file included a list of random IDs assigned to each client, with corresponding treatment group assignment, total score, and sequence of assessment. Initial assessments were assigned “Sequence 1” and subsequent assessments, completed 3 months apart, are sequentially ordered. Each treatment group within the files was then sequentially ordered, so that averages of sequence 1, sequence 2, and so on, could be analyzed for all variables and treatment groups. Descriptive statistics, including the mean, median, mode, standard deviation and dispersion, of each variable was calculated for each of the treatment groups. This provided numerical data for each group so that groups may be compared. The means of each group was compared to determine effect size. This was done for each Excel file for each assessment.

After the data was better organized for all variables, a multivariate analysis of variance (MANOVA) was performed utilizing SPSS. This provided the opportunity make inferences and draw further conclusions about the data, which also aided in selecting data and statistical analyses to utilize for further examination. Next, an Analysis of Variance (ANOVA) between

the three groups through one-way and multivariate tests provided further information regarding the significance and relationship between each of the groups. Furthermore, additional information was gathered and compiled to identify correlations, determine potential extraneous or confounding variables, and to fully understand the nature of the data. Lastly, once statistical analyses were completed, the hypotheses were evaluated to determine accuracy, efficacy of the results, and to aid in making final conclusions regarding the research.

RESULTS

Descriptive Statistics

Of the data provided, all DLAs (n = 2,717), PHQ-9s (n = 2,029), GAD-7s (n = 1,516), and CSSR-Ss (n = 3,901) were examined. There was a total of 447 participants, which consisted of 57.49% females (n = 257) and 42.51% males (n = 190). Approximately 85% of participants identified as “White or Caucasian” (n = 378), 11.63% as “Black or African-American” (n = 52), 0.67% as “American Indian or Alaska Native” (n = 3), 0.45% as “Asian” (n = 2) and 0.22% declined (n = 1). About 97% identified as “Not Hispanic or Latino” (n = 434) and 1.12% identified as “Hispanic or Latino” (n = 5), while 1.79% declined to answer (n = 8). The maximum age was 83, and 19 was the minimum, with an average age of 46.04 and median age of 46. The average length of treatment, in days, was 476.1.

Treatment Group 1. Treatment Group 1 included 147 participants, which consisted of 41.50% males (n = 61) and 58.50% females (n=86). Approximately 82% of participants identified as “White or Caucasian” (n = 121), 14.29% as “Black or African-American” (n = 21), 0.68% as “Asian” (n = 1), while 2.04% noted “Other” (n = 3) and 0.68% declined to answer. Over 95% identified as “Not Hispanic or Latino” (n = 140), 2.04% as “Hispanic or Latino” (n = 3) and 2.72% declined to answer (n = 4). The maximum age was 83, and 20 was the minimum, with an average of 45.04. The average length of treatment, in days, was 181.2.

Treatment Group 2. Treatment Group 2 included 150 participants, which consisted of 56.00% males (n = 69) and 54.00% females (n = 81). Approximately 83% of participants identified as “White or Caucasian” (n = 125) 13.33% as “Black or African-American” (n = 20), 0.67% as “Asian” (n = 1), while 2.67% noted “Other” (n = 4). Exactly 98% identified as “Not

Hispanic or Latino” (n = 147), 1.33% as “Hispanic or Latino” (n = 2) and 0.67% declined to answer (n = 1). The maximum age was 80, and 21 was the minimum, with an average of 46.99. The average length of treatment, in days, was 578.6.

Treatment Group 3. Treatment Group 3 included 150 participants, which consisted of 40.00% males (n = 60) and 60.00% females (n = 90). Exactly 88% of participants identified as “White or Caucasian” (n = 132) 7.33% as “Black or African-American” (n = 11), 0.67% as “Asian” (n = 1), while 2.67% noted “Other” (n = 4). Exactly 98% identify as “Not Hispanic or Latino” (n = 147) and 2% declined to answer (n = 3). The maximum age was 72, and 19 was the minimum, with an average of 46.08. The average length of treatment, in days, was 662.6.

Analysis of Hypothesis 1: DLA Scores

Data from the Daily Living Assessment (DLA or DLA-20) revealed average scores of Group 3 (M = 4.09, SD = 0.56) were higher than Group 2 (M = 3.96, SD = 0.62) and Group 1 (M = 3.86, SD = 0.68), which aligns with hypothesis 1. However, average DLA scores were relatively similar between Treatment Group 2 and 3, which does not align with hypothesis 1. Each DLA treatment group began with approximately 150 participants. After 6 months, a 36% decline in the number of participants was observed in Group 1, while Group 2 (-6%) and Group 3 (-12%) were not as striking; after 12 months, Group 1 (-70%), Group 2 (-29%) and Group 3 (-34%) participation continued to decline. Over two-thirds of participants from Group 2 and Group 3 remained until 27 months into the program, while two-thirds of participants from Group 1 were terminated or quit services prior to 12 months in the program. A Multivariate Analysis of Variance (MAOVA) was conducted to determine significance between Treatment Group placement and each of the measures (Table 1).

Table 1: Multiple Analysis of Variance (MANOVA) for DLA, PHQ-9, and GAD-7.

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.	Partial Eta Squared
Corrected Model	DLA	124.014 ^a	2	62.007	15.276	.000	.531
	PHQ	81.447 ^b	2	40.723	13.957	.000	.508
	GAD	51.101 ^c	2	25.550	9.629	.001	.416
Intercept	DLA	177,437.015	1	177,437.015	43,714.197	.000	.999
	PHQ	2,669.900	1	2,669.900	915.027	.000	.971
	GAD	3,019.663	1	3,019.663	1,137.945	.000	.977
Group Number	DLA	124.014	2	62.007	15.276	.000	.531
	PHQ	81.447	2	40.723	13.957	.000	.508
	GAD	51.101	2	25.550	9.629	.001	.416
Error	DLA	109.594	27	4.059			
	PHQ	78.782	27	2.918			
	GAD	71.648	27	2.654			
Total	DLA	189,546.913	30				
	PHQ	3,016.785	30				
	GAD	3,253.406	30				
Corrected Total	DLA	233.608	29				
	PHQ	160.228	29				
	GAD	122.748	29				
a. R Squared = .531 (Adjusted R Squared = .496)							
b. R Squared = .508 (Adjusted R Squared = .472)							
c. R Squared = .416 (Adjusted R Squared = .373)							

There was a statistically significant interaction effect between treatment group placement and DLA scores ($F(2, 62.00) = 15.27, p < .0001$). Consequently, an Analysis of Variance (ANOVA) was conducted to determine if at least two of the treatment groups are statistically significant from one another (Table 2). There was a statistically significant difference between groups as determined by one-way ANOVA ($F(2, 2,714) = 26.634, p < .0001$).

Table 2: Analysis of Variance (ANOVA) of all DLA data.

ANOVA					
	Sum of Squares	<i>df</i>	Mean Squares	<i>F</i>	Sig.
Between Groups	8,385.26	2	4,192.63	26.634	0
Within Groups	427,228.99	2,714			
Total	435,614.25	2,716			

A Tukey-Kramer Post Hoc (Tukey HSD) test was then conducted to determine a difference in the means of the three treatment groups by examining all possible pairs of means (Table 3), and a greater significance between Treatment Groups 1 and 3 ($p < .0001$) and Treatment Groups 2 and 3 ($p < .0001$) as compared to Treatment Groups 1 and 2 ($p = .004$) was revealed.

Table 3: Tukey HSD of DLA-20.

Multiple Comparisons						
(I) DLA Group	(J) DLA Group	Mean Difference (I-J)	Std. Error	Sig.	95% CI	
					Lower Bound	Upper Bound
1	2	-2.076*	.645	.004	-3.59	-.56
	3	-4.589*	.649	.000	-6.11	-3.07
2	1	2.076*	.645	.004	.56	3.59
	3	-2.512*	.543	.000	-3.79	-1.24
3	1	4.589*	.649	.000	3.07	6.11
	2	2.512*	.543	.000	1.24	3.79

*. The mean difference is significant at the 0.05 level.

Additionally, an Adjusted R-Squared score was calculated for each variable to measure the percent variability adjusted for the number of variables in the model; the score ($R^2 = .496$) suggests a moderate fit between this model and data set and that treatment group placement explains 49.6% of the variability in DLA scores (Table 1).

Analysis of Hypothesis 2: PHQ-9 & GAD-7 Scores

PHQ-9. Data from the Patient Health Questionnaire (PHQ-9) indicates average scores from Group 3 ($M = 12.21$, $SD = 6.98$) to be higher than Group 2 ($M = 8.78$, $SD = 6.91$) and Group 1 ($M = 10.98$, $SD = 6.90$), which does not align with hypothesis 2. However, it was found that Treatment Group 1 scored higher on levels of depression than Treatment Group 2, which aligns with Hypothesis 2.

Although the average scale of depression is higher in Group 3 than the other two treatment groups, a greater rate of change is observed in Group 3 (-26.6%) than Group 2 (-13.1%) or Group 1 (-20.2%) after 12 months. However, Group 1 had the most immediate decrease in scores after 3 months (-19.3%) as compared to Group 2 (-7.1%) or Group 3 (-15.5%). Additionally, a striking decrease in the number of participants was observed in Group 1. After 6 months, more than two-thirds of the initial sample population had decreased in Group 1, while Group 2 didn't lose more than two-thirds of the sample size until 17 months into treatment and Group 3 was 20 months. Average scores of depression (PHQ-9) for the first 12 months are shown in Figure 2, where "Sequence 1" represents initial scores obtained and each following sequence number represents a 3-month timespan.

A Multivariate Analysis of Variance (MANOVA) was conducted to determine significance between Treatment Group placement and each of the measures (Table 1). There was a statistically significant interaction effect between Treatment Group placement and PHQ-9 scores ($F(2, 40.72) = 13.96$, $p < .0001$). Consequently, an ANOVA was conducted to determine if at least two of the treatment groups are statistically significant from one another (Table 4). There was a statistically significant difference between groups as determined by a one-way ANOVA ($F(2, 2011) = 51.742$, $p < .0001$). A Tukey post hoc (Table 5) revealed a significant

difference ($p < .0001$) between Group 1 and Group 2 as well as Group 2 and 3 ($p < .0001$), and a slightly less significant difference between Group 1 and 3 ($p = .016$).

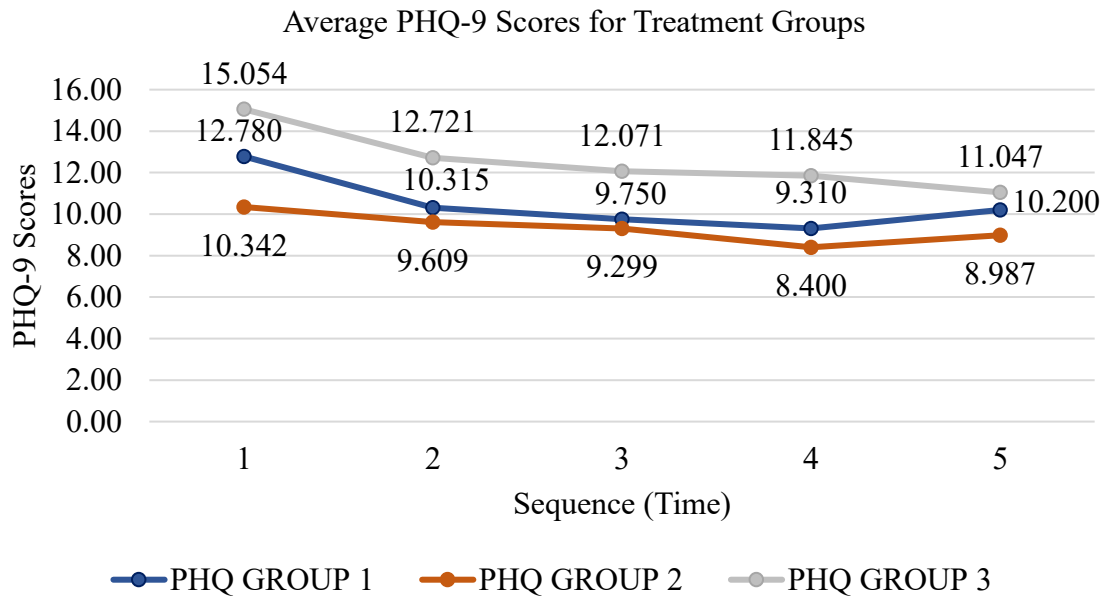


Figure 2. Average PHQ-9 Scores for Treatment Groups.

Table 4: Analysis of Variance (ANOVA) for PHQ-9 scores.

ANOVA					
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Between Groups	4,989.532	2	2,494.766	51.742	.000
Within Groups	96,960.907	2,011	48.215		
Total	101,950.439	2,013			

Additionally, an Adjusted R-Squared score was calculated for each variable to measure the percent variability adjusted for the number of variables in the model; the score ($R^2 = .472$) suggests a moderate fit between this model and data set and that treatment group placement explains 47.2% of the variability in PHQ-9 scores of depression (Table 1).

Table 5: Tukey HSD for PHQ-9 scores.

Multiple Comparisons						
(I) PHQ Group	(J) PHQ Group	Mean Difference (I-J)	Std. Error	Sig.	95% CI	
					Lower Bound	Upper Bound
1	2	2.201*	.455	.000	1.13	3.27
	3	-1.235*	.447	.016	-2.28	-.19
2	1	-2.201*	.455	.000	-3.27	-1.13
	3	-3.436*	.339	.000	-4.23	-2.64
3	1	1.235*	.447	.016	.19	2.28
	2	3.436*	.339	.000	2.64	4.23

*. The mean difference is significant at the 0.05 level.

GAD-7. At admission, the average GAD-7 scores of participants from Treatment Group 1 AND 3 were relatively similar ($M = 13.06$; $M = 13.63$), while the initial GAD-7 scores for participants in Treatment Group 2 averaged to be slightly less ($M = 11.02$). At 6 months, the average scores of Treatment Group 1 (-24.02%) had decreased much more significantly than that of Treatment Group 2 (-9.85%) or Treatment Group 3 (-12.06%); however, at the same time, Treatment Group 1 had lost over 78% of the initial participants, while Treatment Group 2 and 3 had lost 28% and 27%, respectively. At 12 months, each treatment group had approximately a 16% decrease in GAD-7 scores from initial assessment. On average, throughout the duration of services, GAD-7 scores tend to be lower in participants in Treatment Group 2 ($M = 8.50$) than Treatment Group 1 ($M = 11.27$) or Treatment Group 3 ($M = 11.17$).

A Multivariate Analysis of Variance (MANOVA) was conducted to determine significance between Treatment Group placement and each of the measures (Table 1). There was a statistically significant interaction effect between Treatment Group placement and GAD-7 scores ($F(2, 25.55) = 9.63, p < .0001$). Consequently, an ANOVA was conducted to determine if at least two of the treatment groups are statistically significant from one another (Table 6).

There was a statistically significant difference between groups as determined by a one-way ANOVA ($F(2, 1,513) = 28.354, p < .0001$). A Tukey post hoc (Table 7) revealed a significant difference between Group 1 and Group 2 ($p < .0001$) and Group 2 and Group 3 ($p < .0001$), while Group 1 and 3 was not significant ($p = .998$).

Table 6: Analysis of Variance of GAD-7.

ANOVA					
	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Between Groups	2,374.813	2	1,187.406	28.354	.000
Within Groups	63,361.902	1,513	41.878		
Total	65,736.714	1,515			

Table 7: Tukey HSD of GAD-7.

Multiple Comparisons						
(I) GAD GROUP	(J) GAD GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% CI	
					Lower Bound	Upper Bound
1	2	2.586*	.488	.000	1.44	3.73
	3	.031	.479	.998	-1.09	1.16
2	1	-2.586*	.488	.000	-3.73	-1.44
	3	-2.556*	.364	.000	-3.41	-1.70
3	1	-.031	.479	.998	-1.16	1.09
	2	2.556*	.364	.000	1.70	3.41

*. The mean difference is significant at the 0.05 level.

Additionally, an Adjusted R-Squared score was calculated for each variable to measure the percent variability adjusted for the number of variables in the model; the score ($R^2 = .373$) suggests a low-to-moderate fit between this model and data set and that treatment group placement explains 37.3% of the variability in GAD-7 scores of anxiety (Table 1).

Analysis of Hypothesis 3: Overall Quality of Life

A MANOVA was utilized to determine significance with respect to sequence of the measures (Table 1). There was a statistically significant interaction effect between Treatment Group placement and each of the measures: DLA ($F(2, 62.00) = 15.27, p < .0001$), PHQ-9 ($F(2, 40.72) = 13.96, p < .0001$), and GAD-7 ($F(2, 25.55) = 9.63, p = .001$). A Tukey post hoc (Table 8) revealed a significance between Treatment Group 1 and 3 ($p < .0001$) and Group 2 and 3 ($p = .001$) within the DLA; Group 2 and 3 ($p < .0001$) in the PHQ-9; and, Group 1 and 2 ($p = .004$) and Group 2 and 3 ($p = .002$) within the GAD-7.

Table 8: Tukey HSD of DLA, GAD-7 and PHQ-9.

Multiple Comparisons							
Dependent Variable	(I) Group Number	(J) Group Number	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
DLA	1.00	2.00	-1.3968	.97410	.338	-3.8120	1.0183
		3.00	-4.8617*	.95818	.000	-7.2375	-2.4860
	2.00	1.00	1.3968	.97410	.338	-1.0183	3.8120
		3.00	-3.4649*	.84098	.001	-5.5500	-1.3797
	3.00	1.00	4.8617*	.95818	.000	2.4860	7.2375
		2.00	3.4649*	.84098	.001	1.3797	5.5500
PHQ	1.00	2.00	1.9206	.82589	.069	-.1271	3.9683
		3.00	-1.8463	.81240	.077	-3.8606	.1680
	2.00	1.00	-1.9206	.82589	.069	-3.9683	.1271
		3.00	-3.7669*	.71303	.000	-5.5348	-1.9990
	3.00	1.00	1.8463	.81240	.077	-.1680	3.8606
		2.00	3.7669*	.71303	.000	1.9990	5.5348

Table 8 Continued

Dependent Variable	(I) Group Number	(J) Group Number	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
GAD	1.00	2.00	2.7719*	.78761	.004	.8191	4.7247
		3.00	.1026	.77474	.990	-1.8183	2.0235
	2.00	1.00	-2.7719*	.78761	.004	-4.7247	-.8191
		3.00	-2.6693*	.67998	.002	-4.3552	-.9833
	3.00	1.00	-.1026	.77474	.990	-2.0235	1.8183
		2.00	2.6693*	.67998	.002	.9833	4.3552

Based on observed means.

The error term is Mean Square (Error) = 2.654.

*. The mean difference is significant at the .05 level.

Subsequently, the data from each measure was organized into sequential order, and averages were calculated for the first 9 sequences for each variable for each group. The first sequence, or sequence 1, represents the initial assessment for that individual of the specific measure. Each sequence following represents a three-month follow-up. In order to conduct a MANOVA to determine the relationship between the measures and group placement, only the first nine sequences were utilized, to current and account for the decrease in participation. A MANOVA was then conducted and the interaction between the assessment types with respect to group placement was determined (Table 9), which found that there was no significant interaction between the assessment measures ($p = .052$). Reduced interaction between measures used in a correlational study provides more reliable results than a study using measures that highly correlate. Each measure analyzes a unique construct and is then subsequently used to provide insight into the QoL of individuals.

Table 9: Multivariate Tests of MANOVA for DLA, PHQ-9 and GAD-7.

Multivariate Tests							
	Effect	Value	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.910	4,994.960 ^a	3.00	1,487.00	.000	.910
	Wilks'	.090	4,994.960 ^a	3.00	1,487.00	.000	.910
	Lambda						
	Hotelling's	10.077	4,994.960 ^a	3.00	1,487.00	.000	.910
	Trace						
	Roy's	10.077	4,994.960 ^a	3.00	1,487.00	.000	.910
DLA	Largest Root						
	Pillai's Trace	.019	4.676	6.00	2,976.00	.000	.009
	Wilks'	.981	4.690 ^a	6.00	2,974.00	.000	.009
	Lambda						
	Hotelling's	.019	4.705	6.00	2,972.00	.000	.009
	Trace						
PHQ	Roy's	.018	8.925 ^b	3.00	1,488.00	.000	.018
	Largest Root						
	Pillai's Trace	.042	10.668	6.00	2,976.00	.000	.021
	Wilks'	.958	10.776 ^a	6.00	2,974.00	.000	.021
	Lambda						
	Hotelling's	.044	10.883	6.00	2,972.00	.000	.021
GAD	Trace						
	Roy's	.044	21.687 ^b	3.00	1,488.00	.000	.042
	Largest Root						
	Pillai's Trace	.021	5.245	6.00	2,976.00	.000	.010
	Wilks'	.979	5.258 ^a	6.00	2,974.00	.000	.010
	Lambda						
DLA *	Hotelling's	.021	5.270	6.00	2,972.00	.000	.011
	Trace						
	Pillai's Trace	.024	1.511	24.00	4,467.00	.052	.008
	Wilks'	.976	1.511	24.00	4,313.35	.052	.008
	Lambda						
	Hotelling's	.024	1.511	24.00	4,457.00	.052	.008
PHQ *	Trace						
	Roy's	.015	2.709 ^b	8.00	1,489.00	.006	.014
GAD	Largest Root						

a. Exact statistic.

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

Notable Observations: Columbia Suicide Severity Rating Scale

Data from the Columbia Suicide Severity Rating Scale (CSSR-S) revealed that over 50% of the population (n = 3,901) admitted to having attempted suicide at some point in the past, with 14.48% having done so within the past 3 months (n = 305) and 21.45% between 3 and 12 months (n = 452). Over 50% of each Treatment Group reported having ever attempted suicide in the past, and a higher percentage of participants reported a suicidal attempt within the past year in Group 2 (29.96%) than Group 3 (17.90%) or Group 1 (7.37%). However, Group 3 had a more prevalent report of suicidal attempts within the past 3 months (16.56%), as compared to the other groups. Of all participants (n = 3,901), 4.13% were classified as a “Moderate Risk” (n = 161) and 9.27% as a “High Risk” (n = 362).

While all three treatment groups have relatively the same percentage of “presence of a death-wish,” participants from Treatment Group 3 report ongoing thoughts of suicide more frequently (14.05%) than Treatment Group 1 (7.85%) or Treatment Group 2 (5.94%). Of all participants who stated they had present thoughts of suicide (n = 412), the presence of ideation (62.69%), intent (81.48%) and a plan (22.22%) were much more prevalent in participants within Group 1.

DISCUSSION

Findings

Results suggest that DLA scores of overall functional ability tend to be higher, on average, within Treatment Group 3 than the other two treatment groups. Additionally, participants within Treatment Group 3 often remained in services longer than the other treatment groups. Although no descriptive statistics are available regarding the diagnosis/es of participants, or the respective severity, it was initially hypothesized that individuals with more severe and persistent diagnosis/es would likely select Treatment Group 3. If this is true, it is striking that Treatment Group 3 possess higher DLA scores than the other groups, for it is thought that those conditions and illnesses would be more debilitating. It is also likely, however, that individuals with diagnosis/es causing intense paranoia might select Treatment Group 1, in an attempt to refrain from taking medications or speaking to a therapist. Additionally, it is possible that individuals within Treatment Group 1 may have consulted an outside physician or psychiatrist for medication management, unknown to the researchers and the organization of the study, which would severely confound results within this study and suggest that Treatment Group 1 is even less functional with worsened quality of life than previously known or reported. Treatment Group 1 is presumed to be more volatile than other treatment groups, as a result of participants' poor health outcomes and diagnosis/es, resulting in lower functional ability and shortened treatment length. Conversely, the combination of therapy, psychiatry and case management services has demonstrated an overall improvement in daily living abilities with enhanced treatment duration.

On average, the scale of depression is higher in Treatment Group 3 than the other two treatment groups, which may be attributed to diagnosis/es or even a change in time. However, Treatment Group 3 has significantly decreased PHQ-9 scores compared to other treatment groups, which is likely a result of combined treatment approaches to address physical, mental and biological needs. Additionally, additional and more intensive treatment may also provide an increased sense of support and companionship, which may also affect scores of depression. Although Treatment Group 1 sees a quicker decrease in PHQ-9 scores as compared to Treatment Group 2, this is likely a result of a significant drop in the sample size of Treatment Group 1 over time. In all, after a year of treatment, participants in Treatment Group 3 have a more significant decrease in scores of depression than the other two treatment groups.

All three treatment groups had similar scores of anxiety at the initiation of services based on data from the GAD-7. Results suggest that, on average, scores tend to be lower in participants within Treatment Group 2 than the other two treatment groups throughout the duration of services. Additionally, levels of anxiety, based on GAD-7 scores, don't seem to be affected much by group placement within the first 12 months of treatment.

Additional Observations

Over 50% of the population admitted to having attempted suicide at some point within the past, with 14.48% having done so within the past 3 months and 21.45% between 3 and 12 months. Each treatment group was found to have approximately 50% of participants report having attempted suicide in the past, suggesting that attempts of suicide are not correlated to group placement. However, it was found that a higher percentage of participants reported attempted suicide within the past year in Treatment Group 2 (26.96) than Treatment Group 3

(17.90%) or Treatment Group 1 (7.37%). This finding may be attributed to the fact that participants in Group 2 were not receiving therapy or counseling like those participants in Group 3. Additionally, the findings from Treatment Group 1 may be erroneous as a result of significantly decreased participation.

When examining the CSSRS, it was found that although participants in Treatment Group 3 reported ongoing thoughts of suicide more frequently and had more attempts of suicide within the past 3 months than any other treatment group, they also were less likely to report the presence of suicidal ideation, intent or having a plan. Initially it was hypothesized that participants within this group may have a lessened intent or plan of action as a result of therapy or psychiatry; however, it was later suggested that these participants are less likely to report having any intent or a plan to healthcare professionals. Instead, participants from Treatment Group 1 were more likely to report the presence of suicidal ideation, intent or a plan. This implies that a barrier in communication exists in individuals who have more severe depression and suicidal ideation with their respective healthcare professional(s). This finding may be attributed to a number of factors, and further research may be necessary.

Limitations

Limitations exist within all studies, which create the potential for research to be confounded. Such limitations must be addressed prior to, during, and following the study. Possible limitations were taken into consideration throughout the duration of this study. A primary researcher of this thesis, Tyler Z. Tooley, was an employee of an organization in which data was collected from at the time of this research, suggesting some degree of researcher bias may exist. In order to combat any form of reporting bias, both positive and negative literature

was discussed, a formulation and rationale for the study was completed in collaboration with individuals who do not possess such bias, and all data was de-identified prior to being obtained by the researchers. Additionally, results and methods were reported honestly and fairly, both positive and negative, and were reviewed by collaborating faculty.

Each assessment used within this study measured a particular variable, which was subsequently used to examine quality of life, since no assessments were available to specifically measure quality of life. Therefore, myriad factors were used to draw conclusions about quality of life, including levels of depression and anxiety and overall functional ability of participants. Additionally, each measure was scored by a clinician, whose perception of symptoms and ratings of severity may differ from other clinicians, over time and between participants. Research on interrater reliability, and other various forms, of the assessments was addressed within the thesis.

Lastly, Treatment Group 1 had significantly reduced participation, which may affect the outcomes and results of various analyses. Sample dropout was taken into consideration throughout the duration of the study, and results were reported while cognizant of this. Information regarding diagnosis/es of participants, and other relevant factors, were not available to researchers and may have affected resulting information from this study.

Purpose and Recommendations

The purpose of this study is to provide insight and education to mental health clinicians, politicians and the general public of the numerous effects poverty has on mental health, in addition to the most effective ways to combat those insidious effects. For mental health clinicians, the well-being and success of clients is an integral part of mental health treatment. This retrospective study provides clinicians with tools and information to continue to support the

well-being and success of clients, especially those who struggle with poverty or low socioeconomic status. Such tools aid in addressing the access to and practice of mental healthcare for people of low socioeconomic status.

Ultimately, the goal of this research is to provide evidence of the impecunious lifestyle of people living in poverty and to highlight the prodigious need for assistance to supply basic health services for survival and a rudimentary quality of life, at minimum. This evidence ought to influence policy makers and their respective constituents in supporting publicly funded health programs for more integrated care for those of lower socioeconomic status.

Additionally, results suggest that further research must be initiated in order to further determine the extent of impact SES has on mental health and overall quality of life, and whether treatment programs, such as collaborative treatment, has an impact on those outcomes. It is also recommended that treatment facilities consider integrating collaborative mental health treatment approaches in order to better serve the community and its members who are of low socioeconomic status. Lastly, it is imperative that clinicians have appropriate training in determining the socioeconomic status of their clients, in making effective treatment goals relative to their financial, economic and environmental barriers, and in providing the most beneficial and appropriate services and care.

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Appendices

Appendix A: Institutional Review Board (IRB) approval letter

Date: 1-13-2020

IRB #: IRB-FY2020-436

Title: THE EFFICACY OF IMPLEMENTING A COLLABORATIVE MENTAL HEALTH APPROACH ON QUALITY OF LIFE FOR INDIVIDUALS OF LOW SOCIOECONOMIC STATUS

Creation Date: 12-2-2019

End Date:

Status: **Approved**

Principal Investigator: Joseph Hulgus

Review Board: MSU

Sponsor:

Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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Key Study Contacts

Member	Joseph Hulgus	Role	Principal Investigator	Contact	josephhulgus@missouristate.edu
Member	Joseph Hulgus	Role	Primary Contact	Contact	josephhulgus@missouristate.edu
Member	Tyler Tooley	Role	Investigator	Contact	Tooley125@live.missouristate.edu

Appendix B: Burrell Behavioral Health approval

October 29, 2019

To Whom It May Concern,

Tyler Tooley and I have discussed his proposed research project regarding using the Daily Living Activities Functional Assessment (DLA-20). I am providing authorization for Tyler to implement her project at Burrell Behavioral Health, under the supervision of the Quality Improvement and Compliance Department. To this end, Tyler will be given access to coordinate with Matthew Underwood, the Director of Quality Improvement and Research, to assess change in scores of clients who have been administered the DLA-20. It is up to Tyler to secure all necessary approvals and authorizations that relate to Missouri State University, Burrell Privacy and Security to ensure compliance with HIPAA and other privacy laws and regulations, and an authorized Institutional Review Board should that be deemed necessary.

Please do not hesitate to contact me if I can be of further assistance.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas Janousek Psy.D.", with a stylized flourish at the end.

Thomas Janousek, Psy.D.

Vice President, Quality and Compliance

Burrell Behavioral Health

Appendix C: Department of Mental Health (DMH) authorization form

MICHAEL L. PARSON
GOVERNOR

MARK STRINGER
DIRECTOR

STATE OF MISSOURI
DEPARTMENT OF MENTAL HEALTH

1706 EAST ELM STREET, P.O. BOX 687
JEFFERSON CITY, MISSOURI 65102
PHONE: (573) 751-4122 FAX: (573) 751-8224
www.dmh.mo.gov

May 3, 2020

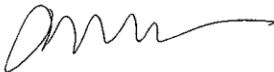
Matthew Underwood, MS
System Director, Quality Improvement & Research
2885 W. Battlefield Road
Springfield, MO 65807

Dear Dr. Underwood:

After review of the material on the study entitled "**The Efficacy of Implementing a Collaborative Mental Health Approach on Quality of Life for Individuals of Low Socioeconomic Status**" ", it has been determined that the proposal is purely retrospective chart review, does not involve direct contact with clients and will not contain confidential information. Therefore, no further authorization or approval is needed from our agency.

Although not required, I would appreciate a copy of your findings. Good luck with your project.

Sincerely,



Brooke Mayfield, Ph.D.
PRC Chairperson

BM:lm

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