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Risk and Protective Factors to Well-being in Foster Care Youth Prescribed Psychotropic Medication in a Wraparound Program of Care

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ABSTRACT

Background: Youth in foster care are prescribed psychotropic medications at higher rates and are more likely to experience disruptions to their medical care. Wraparound models of care have been shown to improve outcomes for youths on psychotropic medications, however, these methods have proved difficult to replicate in the foster care population. Government policies have called for better oversight in the foster care population and in response programs have been implemented, however, there remains little research for these programs. **Objective:** This research will evaluate the characteristics of foster care youth as they enter a Wraparound model of care and the predictive value of these characteristics on psychotropic medication prescribing. The research will also identify the association of Wraparound care on specific outcomes of well-being in foster care youth. **Method:** This research uses a quantitative analysis of data from a specific Wraparound model of care through a retrospective case control study. The initial data analysis identifies sociodemographic variations, as well as potential protective and risk factors of these youth through linear regression modeling. A second analysis of youth with multiple data points was used to identify the relationship of the measures of well-being of those prescribed psychotropic medications while in this Wraparound model of care. **Results**: Analysis demonstrates that age, sex, race, BMI, zip code and presence of medical home together can account for the variance in psychotropic medication prescribing, with individual variable significance including age, sex and BMI, and no significant correlation to zip code or medical home. The access to care provided by WAW demonstrate no improved health outcomes with PPP associated with increased number of placements (p<.001), and increased BMI and increased number of placements

in those with medical homes ($p<.001$). Repeated use of psychological care improved with those in WAW with 50% of those with an initial evaluation receiving follow up care, however, there was no associated decrease in the number of psychotropic medications.

Discussion and Clinical Implications: These findings contribute to the understanding of the variables that contribute to well-being for foster care youth on psychotropic medications. These findings are essential to ongoing programmatic design, implementation, and evaluation, as well as promoting policy that supports similar programs for foster care youth that promote well-being.

Chapter 1: Identification of the Current Problem

Introduction

The United States Department of Health and Human services reports that disruptions in family dynamics lead to over 407,000 children in foster care annually (2023). Foster care youth are at a higher risk for problems related to health, well-being, and continuity in care making comprehensive oversight essential to promote well-being for these youth (Bertram & McKanry, 2022a, 2022b). This current research intends to examine a specific program that was developed to provide this needed comprehensive oversight. The researcher will identify characteristics of foster care youth as they enter a comprehensive care model and the influence of this care on identified outcomes of well-being. Detailing the characteristics of these youth contributes to the current body of research that aims to understand the risk factors for this population. The program analysis intends to demonstrate if the comprehensive model of care mitigates identified risks to outcomes of well-being.

Specifically, this research will focus on risk and protective factors associated with psychotropic medication use in foster care youth. Psychotropic medications increase the health risks for all children, not just foster care youth, and identification of these risks has led to the development of government guidelines for oversight of medication management for youths on psychotropic medications. The practice of prescribing psychotropic medications is more prevalent for children in foster care making the need for medication oversight critical (Bilaver et al., 2020; McGuire et al., 2021). Assessment of foster care youth in a program designed for this type of oversight will allow the researcher to identify characteristics of those on psychotropic medications and the

influence of the program on medication prescribing, care management, and overall well-being. This chapter will further define the problem of psychotropic medication prescribing for this population and report current research findings on risk and protective factors to well-being facing foster care youth. It will also demonstrate the need for ongoing evaluation of the interventions created to minimize the risks to well-being that foster care children face.

Problem

Placement into foster care, regardless of the reason for placement, is known to disrupt normal growth and development leading to potential developmental delays and manifestation of mental health symptoms (Herd et al., 2023; Konijn et al., 2019; Wade et al., 2018). Early removal from the home, even for short periods of time, can affect attachment styles and can compound the impact of adverse events the child had prior to coming into care (Miranda et al., 2019). Foster care youth are at higher risk of developing abnormal stress responses due to repeated exposure to adversity without the access to necessary supports to facilitate the development of coping skills (Rafeedie et al., 2019). Previous research reports that foster care youth experience increased rates of learning disabilities, developmental delays, and depression, and are three times more likely to suffer from mental health disorders, including anxiety disorder, oppositional defiant disorder, and conduct disorder (Bilaver et al., 2020; Boel-Studt et al., 2020; Bozi et al., 2022; Calleja & Dadah, 2018). Preventative care, like pediatric well-child care, is critical to identifying these disabilities early and in providing improved long-term health, increased lifespan and decreased overall health care costs (Crittenden & Fang, 2021).

These developmental and mental health challenges, regardless of the etiology of such symptoms, contribute to the increased prescribing of psychotropic medications for this population. Studies have identified that greater than 50% of all children in foster care have an educational need or behavioral diagnosis and 33% are on psychotropic medications, in comparison to 20% and 9% respectively for non-foster care youth (Bilaver et al., 2020; McGuire et al., 2021). Foster care youth often carry multiple diagnoses which contributes to likelihood of multiple psychotropic medications, is associated with increased number of placement changes, and increases individual risk for need for residential treatment (Leathers et al., 2021). Residential treatment options provide intensive services for youth with mental health needs, however, are costly with an estimated healthcare cost of greater than $82,000 per year versus around $16,700 per year for those in foster homes (Ohio Department of Medicaid, 2023). The alternative to residential care that county case workers face, due to the level of needs of the child, is a series of short-term foster homes with caregivers that are not necessarily provided with the training to meet the needs of the child leading to repeated disruptions in placement (Front & Gershoff, 2020).

Wraparound care attempts to fill this gap in care by providing comprehensive services to enable access to the care that is needed for foster care youth to ensure they are receiving basic care. Ongoing access to preventative care, such as well-child care and psychological evaluations, is associated with improved overall health outcomes in the general population (Graham et al., 2018). States and communities that have implemented Wraparound systems of care have also demonstrated a positive impact on service patterns and decreased the health care costs for care for youth with serious mental health illnesses,

however, these studies have not identified the impact on the foster care population (Stroul et al., 2013).

Continuity and ongoing uninterrupted care are most optimal to address the mental health needs in children, however, foster care youth are unlikely to receive care without interruption in services adding to health care costs and potential redundant services (Bertram, 2018). When psychotropic medications are prescribed, this pattern of care can compound the risks of these medications. The American Academy of Child and Adolescent Psychiatry (AACAP) recommends prescribing psychotropic medication only as part of a biopsychosocial treatment plan that requires understanding of the biological, psychological, and environmental factors that contribute to the youth's needs and well-being (2018). This framework for psychiatric care identifies the complexities of mental health disorders and takes into consideration the multifactorial etiology of each disorder (Tripathi et al., 2019). Unfortunately, comprehensive treatment plans that include multi-pronged approaches are also costly and difficult to implement in the foster care system.

Foster care youth often lack the structural support to seek out this type of care. The family structure and support needed for normal growth and development are disrupted by foster care making these youths dependent on their caseworkers for structure, to advocate for them and to provide access to care. Case workers are faced with obstacles that prohibit understanding of the needs of the foster care youth. Availability of resources to understand psychotropic medications and diagnoses, workplace demands, and high burnout rates are identified in the literature as barriers to case workers' abilities to effectively advocate for appropriate psychotropic medication oversight (Bertram &

McKanry, 2022). For foster care youth, disjointed care contributes to the youth's lack of understanding of their own mental health needs, in addition to lacking a caregiver or provider who understands these needs (Appleton et al., 2022). These factors contribute to the complexities of how to safely treat this population and demonstrate support for programs that specifically support biopsychosocial treatment plans for foster care youth to assure ongoing safety in psychotropic medication use.

The increase in prescribing of psychotropic medications in foster care youth and the need for comprehensive treatment plans was addressed at the national level in the 2011 Child and Family Services Improvement and Innovation Act which mandated protocols for monitoring medication use (H.R.2883). This led to the development of programs in individual counties and state levels to support this monitoring process, however, with no standardized best-practice policy or procedures provided at the federal level. As such, these programs vary throughout the country based on the guidelines, expectations, outcomes of interest, data management, policies, and practices of the individual counties they serve, leading to varying levels of prescriptive oversight. Furthermore, Child Welfare programs are care-delivery focused and may not prioritize research or program evaluation. As such, many of these programs throughout the country have been designed and implemented without a program evaluation framework or strong method for tracking outcomes over time and across individuals. In response, research has begun on evaluation of program design and the feasibility of wellness coordination programs that address the overall well-being of youth in foster care with specific oversight on psychotropic medication use (Bertram & Acosta, 2019; Olsen et al., 2018; Wu et al., 2018**).** However, there remains a lack of research and evidence focused on a) the factors that might

contribute to youth being prescribed (potentially over prescribed) medication and b) the individual youth health and well-being outcomes associated with the implementation of specific wellness coordination programs.

Purpose

This current research intends to fill these gaps in literature by exploring the data from a specific wellness program focused on medication oversight created and implemented with the goal to assure appropriate care in psychotropic prescribing for youth in foster care. The care received is assessed based on the domains of well-being in alignment with United States Department of Health and Human Services Administration on Children, Youth and Families (ACF) 2011 Child and Family Services Improvement and Innovation Act, which include physical health and development domain, social functioning domain, behavioral and emotional functioning domain, and cognitive development domain (Lou et al., 2008). The specific aims are:

Aim 1: Examine sociodemographic characteristics associated with psychotropic medication prescribing in foster care youth. Specifically, identify if sociodemographic characteristics, including age, sex, race, zip code, and presence of medical home, and body mass index (BMI), available on intake into the foster care system predict psychotropic medication prescribing in foster care youth.

Aim 2: Evaluate the influence of the Wrap Around Wellness™ (WAW) program on foster care youth and their overall well-being. Specially,

a. Identify if WAW increases preventative care as measured by presence of post placement physical and presence of medical home, and their influence on the physical health and development and social functioning domains.
b. Identify if a comprehensive care model increases preventative care as measured by presence of psychological evaluation and its influence on the behavioral and emotional functioning domain.
c. Identify if a comprehensive care model increases presence of mental health diagnoses and its influence on the cognitive functioning domain.

This current research focuses on the outcomes of this singular program, WAW, which oversees the care of foster care youth in five counties in a Midwest state and aims to identify variables that may influence the overall care and well-being of foster care youth on psychotropic medications. The specific variables studied are defined in Table 1 and will be explored further through the current state of the literature of each variable of interest in Chapter 2.

Significance

The Foster Care system in the United States was created to respond to the problem of homeless and abandoned children with a focus on resolving homelessness, later expanded to removing children from harmful environments (United States Department of Health and Human Services, 2023). This model focused on the immediate problem, or deficit for the child, and created the framework for our child welfare problem-based system. Social reforms in the 1960s expanded the services of the child welfare system and the framework began to shift to the current policy and practice framework of a strength-based model that incorporates individual goals for foster care youth to promote

their well-being (Lou et al., 2008). To define the individual strengths, the physical and mental health status of the child as they enter into care is needed. A better understanding of the current state of health, risks to this health, and protective factors in place for the youth at the time of custody serves as a guide to providing comprehensive care. By defining the relationship of the variables that are identified here as risks or protective factors to well-being, this researcher intends to contribute to the research on these strength-based models of care directed at foster care youth on psychotropic medications.

There is a growing body of literature on the risk factors that affect various outcomes for foster care youth. A further exploration of these risks and an understanding of potential risks within the community will allow for better targeted comprehensive care models. The following review of the literature on the contributing factors to psychotropic medication prescribing in foster care youth will illustrate the ongoing need to reassess the utility of specific programs and the youth they serve. This ongoing reassessment allows for informed program and policy creation to support a strength-based framework to address the needs of this population. Through the review of literature and theoretical framework discussion, the concepts of risk and protective factors are further explored for foster care youth. It is the intent of the researcher to identify the relationship of not only identified risks, but perceived protective factors as well, in influencing the overall well-being of foster care youth.

Chapter 2: State of the Literature

Introduction

Current research on foster care youth has identified factors that contribute to individual youth outcomes in a wide variety of methodologies with numerous variables of interest. The intent of this review is to define the current state of understanding of variables that specifically influence the outcomes of foster care youth with mental health illness and those prescribed psychotropic medications. Due to the increased physical and mental health risk associated with psychotropic medications, a better understanding of the characteristics of the population of youth that are prescribed these medications allows for earlier identification and stratification of risks. Research demonstrates that foster care youth experience mental health issues at an incidence four to five times greater than the general population, making mental health diagnosis and treatment a priority in providing comprehensive care for this population (United States Department of Health and Human Services, 2023). The prescribing of psychotropic medications is consistently higher in foster care youth and contributes to their risks for a variety of health problems, including metabolic, hematologic, and neurologic problems (Antoniou et al., 2023; Bertram & McKanry, 2022a, 2022b; Bozzi et al., 2022; Candon et al., 2021; Zito et al., 2020, 2021). The increased prevalence of psychotropic medication prescribing compounds the existing risk associated with disjointed and inconsistent care.

While multiple factors contribute to risk in this population, the literature also identifies protective factors that intend to work to diminish the influence of risk on overall well-being. This model of identifying not only the individual risk, but the protective factors, aligns with the strengths-based approach to child welfare that guides

current policy creation. This strength-based approach is an adaptation of the work by Lou and colleagues that identified a risk and resilience model, where risks are influences that increase the probability of harm and protective factors modify the risk (2008). In the context of welfare policy, risk and protective factors influence well-being, which is dependent on good health, access to health care, positive social relationships, and availability of basic resources such as food, shelter, and education (Haybron & Tiberius, 2015).

The literature review will examine the current research on the specific variables impacting the well-being of this population. The variables are divided into three categories: sociodemographic, protective and risk factors, and programmatic research. The literature that supports Aim 1 is focused on socio demographic findings, but relevant findings of this search were also used in protective and risk factor literature findings. Aim 2 is supported through the research presented in the protective, risk and programmatic research findings.

Review of Literature

To define the current state of literature regarding mental health illness and psychotropic medication prescribing in foster care youth and the influence of Wraparound care on well-being, a comprehensive review of the literature was completed. To ensure completion of the search of the current literature, two related searches of the databases were conducted through CINAHL, ePub, PubMed, EBSCOhost and APApsych. Articles were limited to the last five years, with the exception of four articles identified as essential to variable research or groundwork programmatic framework. This limitation on year search is due to recent comprehensive literature reviews done on the state of

Wraparound care that are included here in the literature review. This work also builds from previous research done by Dr. Julie Bertram and Dr Fan Li at the University of Missouri-St. Louis and further historical perspective on Wraparound care is presented in their work.

The search to support Aim 1 of this research utilized the key search terms (psychotropic medications or psychotropic drug or antidepressant or antipsychotic), AND (children or adolescent or youth or child or teenager), AND (foster care or foster children or child welfare), AND (sociodemographic characteristics or sociodemographic factors). A second search was done to support Aim 2 of this research and utilizing key search terms (wraparound care) AND (psychotropic medication or psychotropic drugs or antidepressants or antipsychotics) AND (foster care or foster children or child welfare) AND (outcomes or effects or impacts or consequences). A PRISMA diagram is available in Figure 1 which indicates the overall number of articles and specifies the search results as well.

A total of 141 articles were sought for retrieval, 125 from search one and 16 additional original articles were added with search two. There were 35 total articles, 28 from search one and 7 from search two, identified by the researcher as relevant on the topics above in the foster care youth population. The articles in the review supporting Aim 1, met the following criteria (1) include Foster Care youth as a population in the study (2) pediatric psychological evaluation or pediatric psychotropic medication prescribing is reported in the study population (3) sociodemographic variable significance is delineated in the study population. For the second search, to additionally support Aim 2, the criteria were any program for psychotropic medication oversight for foster care

youth discussed in feasibility, implementation, or outcomes and evaluation. An evidence table of this literature is available in Table 2. The review here summarizes the current understanding of these variables that specifically influence foster care youth with mental health needs, of those prescribed psychotropic medications and available programmatic feasibility and outcomes research findings.

Aim 1 Literature

Sociodemographic Factors

Race. For foster care youth in the United States minority race alone is an identifiable risk. African American children are brought into the foster care system at higher rates, remain in the system longer, have lower adoption rates and lack consistent access to comprehensive supportive services (Branscum & Richards, 2022). Potential protective factors are inconsistent for African American and Hispanic Americans as research has shown that they receive fewer psychological services, have the lowest rate of ongoing utilization of services once initiated, and experience the highest rates of placement change (Ahn et al., 2021; Alwash & Palusci, 2022; Branscum & Richards, 2022; Kim et al., 2021). A study on children brought into welfare services for medical neglect demonstrated that African American children are more likely to be referred for initial services, are more likely to fail reunification and parental remediation, and have higher rates of recurrent patterns of neglect (Alwash & Palusci, 2022). African American and Indigenous people are more likely to have a parent(s) incarcerated, which contributes to an increase in the length of stay in county custody and decreases likelihood to reunify (Muentner et al., 2022). African American children specifically have the highest rate of

parental incarceration with an estimated 43% having at least one parent in jail (Muentner et al., 2022).

This racial disparity is also seen in mental health diagnoses. Identifying a diagnosis can be beneficial to getting appropriate services, however, the disproportionate rates of certain diagnoses without the necessary comprehensive services to support the diagnosis is identified more often in minority races. African American and Hispanic American foster care youth are more likely to be diagnosed with unruly behaviors and conduct disorders and are more likely to be started on medications to treat these disorders, and many times without the necessary psychological supportive therapies and parent coaching (Antoniou et al., 2023; Armstrong-Hoskowitz et al., 2020; Candon et al., 2021). A study that evaluated psychotropic medication prescribing in youth under 6 years of age found that greater than 80% were African American and two thirds carried the diagnosis of disruptive behavior disorder at this early age (doReis et al., 2014). This pattern is lifelong for foster care youth with African American and Hispanic American youths identified as having multiple mental health diagnoses by the time of aging out of the foster care system (Ahn et al., 2021).

Social Adversity. Census data has been used to identify risks for foster care youth. Geographic factors for prescribing patterns of psychotropic medications based on census population data and medical claims found that stimulant medication prescribing was higher in higher income neighborhoods, while antipsychotic medication prescribing was higher in lower income neighborhoods where non-pharmacologic services are inconsistently used in those prescribed antipsychotic medications (Antoniou et al., 2023). For adolescents, the use of antipsychotics is recommended only for those that are

receiving comprehensive psychological services (American Academy of Adolescent and Child Psychiatry, 2023). Economic as well as race disparities have been identified in a study on foster care youth related to community adversity showing that African Americans represented a larger percentage of the high community adversity group and peer influences had a more negative influence on youth placed in these neighborhoods (Bozzi et al., 2022; Osei & Gorey, 2021). Community adversity was based on county-level measures of school performance, juvenile justice involvement, and of food insecurity. These findings are concerning for minority foster care youth in low-income or high adversity neighborhoods and demonstrate patterns of high-risk medication prescribing without the biopsychosocial care and support that is needed to safely provide care.

Age and Sex. The literature identifies a risk associated with medication prescribing with age and sex. Age is positively correlated with psychotropic medication prescribing, evidenced as increased rate of psychotropic medications prescribed for foster care youth after 10 years of age, however, all foster care youth, regardless of age, have increased risk of being prescribed psychotropic medications than those not in foster care (Zito et al., 2021). Sex associations have been varied as many previous associations have related to class of drug and not overall prescribing trends. The drug class associations identify males at higher risk for demonstrating externalizing behaviors and females demonstrating internalizing behaviors, with externalizing behaviors associated with higher risk of psychotropic medication use and an increased number of placement changes (Kim et al., 2021).

Aim 2 Literature

The literature identifies risk and protective factors outside of sociodemographic risk for this population of foster care youth as well These risk and protective factors that influence well-being in this study include measurements from the well-being domains of physical health and development, social functioning, behavioral and emotional functioning, and cognitive functioning. There is no sole determinant of individual well-being, but in general, well-being is dependent upon good health and access to health care, positive social relationships, and availability and access to basic resources such as food, shelter, and education (Haybron, 2015). The Administration for Children and Families (ACF) focuses on supporting interventions that target well-being by addressing the predictable challenges, organizational-structural supports, and evidence-based practices, to specifically improve the well-being of foster care youth (Lou et al., 2008). These challenges and supports are the risk and protective factors that contribute to the domains of well-being for foster care youth and are explored here in the literature.

Protective and Risk Factors

The identified protective variables in the literature that are presented in this research include ongoing medical care, identified here as the post-placement comprehensive physical (PPP), presence of medical home, presence of psychological evaluation and support, including ongoing psychological care and implementation of an individualized education program (IEP) (Alwash et al., 2022; Antoniou et al., 2023; Barnett et al., 2019; Kim et al., 2021; Sadin, 2022). The identification of the protective factors that are present for foster care youth can potentially moderate the influence of foster care on their overall well-being by focusing on the strengths of the individual youth. The current understanding of identified risk factors in foster care youth will focus

on obesity as measured by range of BMI, number of placement changes and range of psychotropic medications. Diagnosis is identified in the conceptual model as a protective factor and can provide risk or protection. Diagnosis accumulation and misdiagnosis could present as a risk factor, however, for this research diagnosis is seen as a protective factor that provides potential access to an IEP. The identification of the protective and risk factors that are present for foster care youth allows the welfare team to better understand the needs of the child not only as they enter care, but throughout their time in foster care.

Presence of Post-Placement Comprehensive Physical (PPP) and Presence of Medical Home. A medical home is a philosophy for primary care practice that is patient-centered, comprehensive, coordinated, and accessible. A medical home is the standard of practice for children with complex medical needs and is a concept within Wraparound care. The concept of Wraparound care is well defined in the literature and is a framework of care for advancing the outcomes of youth with complex mental health needs. Comprehensive care planning provided through Wraparound care can provide a standard of care for foster care youth to support the increased needs of this population. The American Academy of Pediatrics recommends a comprehensive care model for all pediatric patients, with emphasis on capturing those with complex health care needs, like foster care youth (2023). For youth in foster care, it is important to look at models of care that support this comprehensive approach to care due to the complexities related to disruption from family and community. Wraparound care provided a support system that identifies the roles of individuals, family, and the community in youth mental health outcomes (Olson et al., 2021; Schurer Coldiron et al., 2017).

Research looking at the implementation of Wraparound models has identified the need for broad community support, increased access to psychiatric care and coordination of health care needs as the framework to support comprehensive care for foster care youth (Curtis et al., 2015). The model focuses on the partnership of the youth, caregivers, family members, professionals and identified community supports to develop a shared decision-making process to meet set outcomes (Walker, 2008). Evaluation of Wraparound program outcomes have demonstrated improved mental health symptoms and functioning, school functioning, and a reduction in institutionalized and residential care with overall lower healthcare costs (Olson et al., 2021). Although Wraparound care has shown efficacy in many populations, it can be a challenge to implement over time in the foster care system due to the displacement from family and identified community supports. Those communities that have been successful in implementing interventions for foster care youth through Wraparound services, have demonstrated improvement in placement outcomes by supporting youth and their families through their individualized plan of care (Hambrick et al., 2016).

Wraparound care is traditionally centered around the child and caregiver, and in foster care youth the caregiver becomes the custodial county requiring coordination between custodians to reduce the barriers for youth engagement in services and facilitate positive outcomes. The PPP provides the youth an opportunity to connect to a medical home and Wraparound services. The guidelines set forth by the American Academy of Pediatrics for the Comprehensive Health Assessment, referred here as the PPP, includes review of all medical records of the child, including specific medical conditions and subspecialist management, identifying developmental and mental health conditions with screening

tools appropriate for age of child, and creation of a comprehensive and individualized treatment plan that includes the child, caseworker, kinship or foster placement, biological parent and previous medical home (American Academy of Pediatrics, 2023). Placement in foster care is disruptive to care and ongoing medication management; facilitating PPP evaluation aims to provide cohesive care (Bertram, 2018). This PPP assessment becomes a key piece to the ongoing continuous care of the child and is identified, along with presence of medical home, as a protective factor for well-being.

Body Mass Index (BMI). Prevention with on-going health maintenance and education has been shown to be one of the best approaches to combat elevated BMI and obesity. Ongoing regular medical care allows for understanding of preventable, as well as the unavoidable risks factors related to obesity. For foster care youth who seek care, the missing or incomplete medical record limits the provider's ability to fully assess the risk for high, or low, BMI. An elevated BMI is associated with immediate and future health risks and has been identified at higher rates in long term outcomes studies in foster care youth (Patton et al., 2019; Schneiderman et al., 2013). Prevalence of obesity rates in group homes have been reported as high as 60% (Schneiderman et al., 2013). Obese foster care youth are more likely to have multiple mental health diagnoses, increasing the individual likelihood of being prescribed medications that can contribute to metabolic abnormalities and further increases to weight gain, only contributing to continued health problems into adulthood (Patton et al., 2019; Schneiderman et al., 2013). The understanding of the range of BMI of the foster care youth, as well as the changes over time, as an identifiable, and potentially modifiable, risk factor provides insight into ongoing health care needs.

Number of Placements. Placement changes have a variety of negative effects on foster care youth and understanding those at risk for changes in placement is an important factor to prevent disruptions. Current research suggests the strongest predictor of increased number of placement changes are youth that demonstrate externalizing, or disruptive, behaviors which are exacerbated by caregivers that lack the training on behavior management, leading to further disruptions (Vreeland et al., 2020). Outside of externalizing behaviors, research has demonstrated that children with deficits in social skills, coping skills and educational challenges are also more likely to experience disruption in placement, which in turn leads to disjointed use of the resources implemented to address these deficits (Vreeland et al., 2020). Wraparound care aims to facilitate comprehensive care, ongoing assessment, and identification of needed resources despite placement disruption. Ongoing preventative and psychological supportive services, like those received through PPP and psychological assessments, are essential to support the continued needs of foster care youth.

Psychological Evaluation. The assessment of the psychological well-being of youth in foster care offers insight into the learning, socialization, behaviors, and personality development of the child and allows for an individualized plan of care for education and mental health needs. Foster care youth have all experienced trauma by being removed from their homes and need trauma-informed care that involves ongoing and comprehensive mental health care. Childhood trauma associated with foster care has been linked with a higher expenditure of healthcare costs in adulthood and negatively impacts personal well-being (Patton et al., 2019). Assessment of the patterns of trauma in foster care youth found that greater than 90% of foster youth had a traumatic event and more

than half had four or greater traumatic events (Spinelli et al., 2021). Childhood adversity specifically related to maltreatment has been shown to contribute to chronic physical and mental health issues with links to morbidity in adulthood (Barnett et al., 2019; Bertram et al., 2022a). Ongoing psychological support is needed to address these impacts to mental physical health.

The use of psychological support services has been evaluated in foster care youth and found that mental health services over the past decade are being initiated at an increased rate in foster care youth, specifically for those that were more likely to experience frequent placement changes (Antoniou et al., 2023; Kim et al., 2021). However, ongoing use of services continues to be inadequate. Repeated use of psychological support services has been associated with improved health care outcomes (Barnett et al., 2019). A study on foster care youth with behavioral difficulties demonstrated improved social and emotional competencies after receiving ongoing targeted supportive interventions (Graham et al., 2018). The number of services needed to demonstrate improvement is not reported. However, only an estimated 26% of foster care youth prescribed psychotropic medications report ongoing use of mental health services compared to 53% of those youths not in foster care (Bitsko et al., 2022; Zablotsky & Ng, 2023).

The benefits of mental health services have also been associated with educational outcomes. A study looking at educational outcomes in foster care youth demonstrated that implementation of psychotherapy was associated with promotion of the skills needed for adjustment and self-regulation to decrease disruptive behaviors that can lead to suspensions and expulsions (Graham et al., 2018). Another study on use of

psychotherapy reported that up to 75% of the study participants prescribed psychotropic medications reported improvement in overall school and social functioning with some reduction in psychotropic medications prescribed (Leathers et al., 2021).

This protective benefit of psychological care has been well established, however, even with reported increased initiation of services, it still falls short of meeting the needs of current prescribing practices. A study that looked at prescribing practices in foster care youth under 6 years of age identified 25% of the study group received at least one psychotropic medication, yet only 7% had at least one therapy session during the study period (dosReis et al., 2014; dosReis et al., 2016). This pattern of overprescribing without implementation of psychological supportive services compounds the risk associated with psychotropic medication prescribing. In foster care youth utilization of mental health services has been specifically associated with decreasing the recurrence of neglect and abandonment and decreasing the risk of youth running away from placement (Alwash & Palusci, 2022; Branscum & Richards, 2022). Despite these benefits, services are often not maintained in foster care youth and medication becomes a singular intervention (Antoniou et al., 2023). The reasons for lack of ongoing care are multifactorial and understanding the individual mental health needs of foster care youth allows the welfare team to identify a plan of care that promotes ongoing use of psychological supportive services.

Range of Psychotropic Medication. Current psychotropic medication prescribing practices are explored throughout the literature to identify prescribing trends. Foster care youth are prescribed psychotropic medications more frequently and are more likely to be prescribed more than one psychotropic medication (Zito et al., 2021) Polypharmacy, or

the prescribing of multiple psychotropic medications, is prevalent in foster care youth and researchers report a fivefold increased risk for foster care youth to receive multiple psychotropic medications, including increased rates of antipsychotic medication prescribing (Zito et al., 2021). Antipsychotics are often started in conjunction with other psychotropic medications in children that demonstrate aggressive and unruly behaviors with intent to improve behaviors, and for foster care youth, to decrease the risk for placement change (Zito et al., 2021). However, research has shown that use of psychotropic medications for management of disruptive behaviors has no impact on future delinquent activity (Armstrong-Horwitz et al., 2020). Polypharmacy prescribing is not just with antipsychotic medications, but with antidepressant medications as well. A study examining the prescribing of antidepressants identified that foster care youth are prescribed antidepressants, which have multiple potential drug interactions and may potentiate suicidal risk, at a rate six higher than those not in foster care (Zito et al., 2020).

The etiology and manifestation of symptoms, as well as the diagnosis at the time of prescribing the psychotropic medication, needs to be carefully explored prior to initiation or continuation of psychotropic medication in this population. The presentation of symptoms needs to be evaluated in context of surrounding life events and potential traumas. A study that looked at children with attention deficit and hyperactivity disorder (ADHD) identified that ADHD-like symptoms can be derived from emotional adversity (Penarrubia et al., 2021). Assessment should include identification of consistencies in behaviors and relation to childhood adversities with psychotherapy recommended as the first line treatment, not medication (Penarrubia et al., 2021).

Not only are psychotropic medications prescribed more frequently in foster care children, but off-label prescribing of medications, prescribing medication for diagnoses for which the medication is not indicated (e.g., antipsychotics), is also reported in this population; specifically in foster care youth with a diagnosis of Attention Deficit-Hyperactivity Disorder (ADHD). A study on the antipsychotic prescribing patterns in the Kentucky Welfare system showed higher off label prescribing rates for children in foster care who demonstrated disruptive and impulsive behaviors, with a reported 47% of those diagnosed with ADHD started on an antipsychotic prior to stimulant medication (Davis et al., 2021). Per the American Academy of Pediatrics and the American Academy of Child and Adolescent Psychiatry, the use of antipsychotics is not first line therapy for ADHD; behavior modification and stimulant use is the recommended treatment path.

Diagnosis. The establishment of a diagnosis may provide both risk and protective factors for foster care youth. An estimated 40% of foster care youths exhibit severe emotional and behavioral problems while in foster care (Kim et al., 2021). This high rate of symptoms may lead to premature diagnosis, or misdiagnosis, with diagnosis accumulation due to lack of continuous care, multiple health care providers, and multiple health care systems (Bertram, 2018). It is critical to have thorough and ongoing reassessment of diagnoses to identify changes that occur over time. Beneficially, an earlier diagnosis or multiple diagnoses may help expedite follow up as the youth transitions throughout health care systems. This was seen in a study that looked at foster care youth with multiple placement changes and identified that 75% of those with a diagnosis were receiving psychotherapy in addition to the medications they were

prescribed (Leathers et al., 2023). There was however no exploration of change in prescribing practices related to diagnosis or use of psychotherapy.

Presence of Individualized Education Program. An Individualized Education Program (IEP) is created to meet the individualized learning needs of the child and creates a collaborative learning plan that promotes the youth's strengths. When properly implemented and supportive of the diagnosis of the child, an IEP is a protective factor that can support the unique educational and behavioral needs of foster care youth in the academic setting. However, school districts have varying degrees of resources and accommodations that may make initiation and transition of IEPs between schools challenging, or sometimes not possible. For successful transition for foster care youth, educators and school administrators need to understand the influence of trauma on learning and behaviors in foster care youth and incorporate guidelines for trauma informed IEP creation (Sadin, 2022). Comprehensive assessment provided through screening evaluations and ongoing preventative care provides diagnostic information to identify those youth that need an IEP.

Use of an IEP, however, is not dependent on diagnosis alone. Studies have shown that placement into foster care can influence access to supportive educational services with foster care youth less likely to receive IEP services than those not in foster care, and those with kinship placement significantly less likely to have and IEP than those in nonrelative foster placement, at 22% vs 54% respectively (Casanueva et al., 2020). There is a lack of literature to identify the correlation of outcomes from use of an IEP in foster care youth. Based on the principles of trauma informed IEP, this population could benefit from evaluation of individual educational needs (Sadin, 2022).

Programmatic Research

The Wraparound model of care considers the patient and family dynamics as the drivers of care. WAW that is used for this research is a Wraparound model of care. The model focuses on the partnership of the youth, caregivers, family members, professionals and identified community supports to develop a shared decision-making process to meet set outcomes (Walker, 2008). While Wraparound care has shown efficacy in many populations, it can be a challenge to implement over time in the foster care system. Wraparound care for foster care youths, when successfully implemented, has shown to have a positive impact on mental and educational functioning as well as reduce out of home placements (Olson et al., 2021). Children in foster care demonstrate higher rates of learning disabilities, developmental delays, depression, and behavioral issues making a Wraparound a model of care essential for ongoing access to care and to improve health outcomes (Boel-Studt et al., 2020; Bozi et al., 2022).

Program outcomes research for Wraparound care have demonstrated improvement in care, however, foster care specific outcomes are often reported with other study participants and little generalizations can be made for foster care youth from specific program outcomes. Medicaid implemented care coordination reports a 28% reduction in use of psychotropic medications, however, identified limited effects on youth with multi-agency involvement (Wu et al., 2018). Foster care youth are frequently involved with multiple health care systems, where this impact of care coordination becomes diminished. Outcomes from care coordination have also been associated with a reduction in the psychiatric hospitalizations and Emergency Department use in youth prescribed psychotropic medications, however, individual characteristics of those that

benefit from this coordination are lacking and no specific foster care outcomes were identified (Tai et al., 2018).

Additional research on outcomes have looked at broader community-based programs but lacked specific discussion on psychotropic medication oversight for foster care youth. A comprehensive review of the literature was done by Settipani and colleagues and looked at community based Wraparound care models and found limited measurable outcomes data highlighting the need for research to examine youth outcomes, cost-effectiveness, and replicability of these programs of care (2019). A more recent comprehensive review of outcomes for Wraparound care reported overall improved outcomes including improved residential stay outcomes, educational outcomes, and mental health symptoms, however identified limitations based on methods to evaluate program outcomes (Olson et al., 2021). Foster care youth were included in the study population, however, no specific correlations to foster care youth outcomes are discussed. There remains a lack of literature focusing specifically on foster care youth outcomes in Wraparound care.

Theoretical Framework

The theoretical framework that guides this research provides an understanding of the significance of risk and protective factors on well-being. The research presented in the review of literature provides insight into the current understanding of 1.) the sociodemographic risk factors that are faced by foster care youth with mental health illness and of those prescribed psychotropic medications and 2.) the state of current programs used for psychotropic medication oversight. These studies identify the need for delineating individual risk as well as individual protective factors for youth in foster care

to promote optimal well-being, specifically for those prescribed psychotropic medications. Current literature guides the conceptual framework for this research, and it was developed to better understand the relationship of specific variables to overall well-being in foster care youth. The conceptual model incorporates concepts identified in the works of Bandura, Deci and Ryan, and Lou and colleagues and is available in Figure 2. The operationalization of this model for the conceptual framework of this research is available in Figure 3.

The resilience framework outlined by Lou and colleagues (2008) originates from the field of social work and has been instrumental in policies developed to promote well-being in foster care youth. Theories from psychology provide additional insight into this research framework, specifically Social Learning Theory and Self Determination Theory. These theories contribute to the understanding of the different influences that improve, or weaken, an individual's strengths through exploring the relationships with the individual's environment. Foster care youth have basic disruptions to their environment and rely on other environmental protective factors to support their individual strengths. Resilience, as defined by Lou and colleagues, is the balancing of protective factors and risk factors to increase individual functioning despite adversity (Lou et al., 2008). Resilience is supported by WAW as it aims to incorporate the strengths of the youth and identify their supports to facilitate the youth's ability to improve their own well-being. Lou and colleagues provide a well-being framework for child welfare practices by identifying the risk and protective factors that are unique to the individual and that influence individual outcomes and adaptability (2008). The protective factors

can help mitigate the risks and focus on individual strengths rather than deficits, promoting resilience and supporting the well-being of the youth.

The environment is central to this framework and is critical in defining individual well-being. The environment, and influences within that environment, can provide the basis for physical and mental development and promote positive behaviors, promoting resilience (Lou et al., 2008). Resilience is met by meeting the developmental needs of the individual to allow successful functioning by providing supportive environmental influences (Bandura, 1997). As these developmental needs are met, the youth is more likely to develop self through mastery of their environment and providing avenues to autonomy and to social belongingness (Deci & Ryan, 1985). WAW promotes the development of autonomy by providing the resources and support to foster care youth to ensure improved access to individualized care.

Concepts from Social Learning Theory and Self-Determination theory provide the perspective into development by focusing on observing the learned or modeled behaviors and identifying social belonging or connectedness (Bandura, 1997; Ryan & Deci, 1985). This is the foundation of the model of resilience which identifies risk and protective factors and has served as the framework for current healthcare policy, including the 2011 Child and Family Services Improvement and Innovation Act. For foster care youth, supporting well-being is dependent on developing resilience through providing youth with a framework of protective learned behaviors, such as preventative care and a network of resources to facilitate connectedness.

Bandura's Social Learning Theory identifies that individuals self-regulate through their environment and develop, or fail to develop, behaviors that promote, or strengthen,

physical and mental well-being by means of reinforcement and modeling (Bandura, 1997). The behaviors demonstrated become the framework of the protective factors, or potential risk factors, which guide the child's development. The child's ability to cognitively process the behaviors is dependent on the resources available to support the child. Providing a child, especially one that lacks a stable home environment, with comprehensive care, like WAW, provides the support a child needs to reinforce positive behaviors and protective factors such as access to preventative medical and psychological care.

The ability to develop self-regulation through environmental influences is explained by Deci and Ryan's Self Determination Theory (Deci and Ryan, 1985). The individual's ability to succeed is more likely when protective factors, such as empathetic and supportive people, are present in an individual's environment to support decisions and outcomes. The protective factors in the environment of the individual can directly influence one's drive and the individual's need for competence, relatedness, and autonomy (Deci and Ryan, 1985). A stable environment for an individual can facilitate these through developing mastery of surroundings, a sense of social belonging and connectedness, and facilitates feelings of self-control (Deci & Ryan, 1985) The framework of WAW supports this by empowering the child with a focus on the individual's needs and providing stability to the environment to allow for continuity in care. By creating individualized comprehensive plans of care WAW aims at development of autonomy and skills needed for improved physical and psychological health.

Research Questions

The framework developed from these central concepts serves as the theoretical guide for these research questions. The individual environment that a foster care youth has varies and the ability to provide to the environment a WAW program, that guides the care that the child receives, provides them with protective factors that aim to improve outcomes. WAW aims to bring access to primary and preventative care which can identify risks and aid the youth in developing autonomy and mastery of self, promoting individual resilience and improved well-being. Loss of these protective factors potentiates the risk factors facing foster care youth and can negatively impact long-term health and well-being. For foster care youth, it seems critical to implement programs to promote well-being. More work is needed, however, to identify the influence of these programs on the individual level outcomes. For this research, the outcomes are objectively measured through the variables BMI, number of placements, range of psychotropic medications prescribed and presence of an IEP. Identifying specific outcomes of programs that address the risks of this population allows for ongoing targeted measures to influence overall well-being.

The risk to well-being that sociodemographic factors, BMI, increased number of placements, and the range of psychotropic medications prescribed have on foster care youth is identified throughout this literature. The protective factors that are provided through WAW can potentially minimize these risks. However, there is a lack of research that looks at the combined risk and protective factors on the outcomes of foster care youth in Wraparound care. Foster care youth deserve care that addresses their individual factors and supports their individual strengths. This research will add to the current body

of literature that identifies risks while adding to the outcomes research on programs created for Wraparound care for foster care youth.

This retrospective review of data intends to provide support for the development of resilience from protective factors despite the risk factors to well-being. This research intends to answer the following research questions. For Aim 1 the research will examine what the association of following are:

1. Identify the association of sociodemographic factors (age, sex, race, zip code), previous medical home, and BMI at the time of intake into the WAW program with psychotropic medication prescribing in foster care youth.

For Aim 2 the research will identify the association of the following:

2(a). The association of presence of a PPP and a medical home with range of BMI and the number of placements for foster care youth.

2(b). The association of presence of psychological evaluations with the range of psychotropic medications prescribed to foster care youth.

2(c). The association of establishment of mental health diagnoses with the presence of an IEP in foster care youth.

Chapter 3: Research Methodology

Design

The research design and analytical methods that are used to define these associations are detailed in this chapter. This research intends to provide an assessment of youth as they enter into and proceed through foster care as well as provide a quantitative analysis of Wraparound care outcomes provided through the WAW Program. Outcomes reported are from a secondary evaluation of the current data collected and utilized by the Children's Permanency Partnership (CPP), who facilitate the WAW program, and the State of Missouri Division of Children and Family Services. A retrospective case control method was applied to identify the well-being of youth in foster care on psychotropic medications receiving care through this program. Specific sociodemographic characteristics are used to develop a model that identifies protective and risk factors for youth in foster care being prescribed psychotropic medications. A secondary analysis with multivariate stepwise linear regression was completed to identify the influence of this model of care on continued well-being. The results of this study will contribute to the current understanding of the risk and protective factors that affect the well-being of this population, as well as add to the current outcomes data research on Wraparound models of care. This research also intends to add a potential method to identify outcomes based on the domains of well-being. This quantitative study addresses the specific Aims and research questions as outlined in Chapter 1 and Chapter 2.

For Aim 1, a secondary analysis of the existing data from youth who entered into CPP database from October 1st, 2017 to September 30th, 2022 were analyzed descriptively and multivariate stepwise linear regression modeling performed to identify

significance of psychotropic medications prescribed. Previous risk prediction modeling has provided critical data for outcomes of youth in foster care (Ahn et al., 2021; Vreeland et al., 2020). The study by Vreeland and colleagues used a similar analytic model to predict risk, specifically placement disruption, from data available through the Tennessee Department of Children and Family Services (2020). The outcomes from the data analysis demonstrated an ability to predict foster care youth outcomes from data collected at time of intake assessment (Vreeland et al., 2020). This current study builds on this previous research methodology; however, the focus here is examining the influence of specified variables on psychotropic medication prescribing in foster youth.

For Aim 2(a)(b) and (c) a secondary analysis of the existing data on foster youth who were brought into CCP and had initial assessment completed from October 1st, 2017 to September 30th, 2022. A copy of the data forms completed at intake into CPP are available in Appendix A. The presence or absence of these preventative, or protective factors, was compared. The results of this quantitative analysis were used to assess whether preventative services are accessed by youth in this Wraparound model of care, as well as the relationship of the presence, or absence, of these protective factors with outcomes in physical health and development measures, social functioning measures, behavioral and emotional functioning measures, and cognitive development measures. The data for Aim 2 (a) (b) and (c) was provided from a select sampling of the population. The sample includes those foster care youth that have multiple assessment data points. A quantitative analysis was used to identify the relationship of these data points. For Aim 2(a) the presence or absence of a PPP and medical home is used to define the association to the outcomes of BMI and number of placements. For Aim 2(b) the presence or absence

of psychological evaluation and the association to a range of psychotropic medications prescribed were analyzed. Lastly for Aim 2(c), outcomes are reported as the presence or absence of mental health diagnoses with presence of an individualized education program (IEP). Similar research designs have provided groundwork data regarding psychotropic medication prescribing in foster care youth by providing insight into psychotropic utilization through measuring prevalence and duration of prescriptions in this population (dosReis et al., 2014).

The utilization of this design does pose a risk of sample bias due to lack of randomization and potential for external variables influencing group outcomes not identified in this study. In addition, a significant amount of data cleaning, inspecting, managing, merging, and removal of duplicates was required. Due to the singular state of location of the population, the overall findings may have limited contribution to foster care youth in other Wraparound programs. However, due to the lack of program outcomes research, these findings prove beneficial to this expanding knowledge base and may serve as an effective evaluation to inform practice in and outside of the State of Missouri.

Procedures and Data Source

A collaborative research agreement was created following submission of an application to conduct research through the Missouri Department of Children and Family Services. Once the application was approved through the state of Missouri, the researcher entered into a data use agreement with CPP to allow access to previously collected data files after being deidentified. A copy of the Data Transfer and Use Agreement is found in

Appendix B. Institutional Review Board (IRB) approval was granted prior to data access and analysis.

Multiple datasets were identified as containing variables of interest required for analyses. The data were deidentified using a randomized multiplier on the DCN known only to the CPP staff member who completed the deidentification of the data. The databases in their original collection form were separate excel spreadsheets available through encrypted files and password protected sharing with the research team. The data were shared in five separate files pertaining to the different data collection tools used through CPP. Data used for this analysis was provided through excel workbooks and included LS-1 forms, Intake Logs, Medication Logs and Biopsychosocial assessments. The LS-1 data includes the comprehensive tracking of the foster care youth currently involved in care and included monthly excel workbooks from 2017-2022 with a total of 60 workbooks. The New intake log was a singular workbook including data on youth in CPP from October 2020 to August 2023. The Psychotropic medication logs are provided periodically throughout the year and included 10 excel workbooks with multiple sheets of data in each spanning from July 2018-October 2022. The LS-1 data captured the majority of the variable data and were merged to create a master excel database. The data from the Psychotropic medication logs were merged with the LS-1 data after variables on the psychotropic medication were bundled into range groups and duplicates were omitted to provide continuous individual level data for each participant. LS-1 data were bundled to align with the available Medication Logs to align existing data prior to the date of completion of the individuals Mediation Log. For example, to capture potential time points of evaluation, LS-1 data from October 2017 through June 2018 were merged at the

point of the Psychotropic Medication Log data were collected. This was repeated for each stretch of LS-1 data until the time of next Psychotropic Medication assessment time point. The data from the Biopsychosocial assessments was used to create an additional database that was then merged to provide a singular excel document to upload for the analysis with SPSS software. All datasets were inspected for completeness and duplicity and then merged based on the client's randomized identification number (PID) and date of assessment. Data were coded appropriately for merging, and a single database was created for use for data analysis. LS-1 dates were linked with medication log dates using the closest date available that occurred prior to the LS-1 assessment. All data were merged using SPSS Version 27.0 (IBM, 2020). Once merged, descriptive analysis and frequencies were run to ensure no data loss on transfer. Data were removed if there was no valid identification number identified and duplicate data were removed based on PID and date of entry into the foster care system. Data requirements are met through the data use agreement through the researching institutions IRB, third party collaborative, and the state of Missouri. No additional consent was needed for this research.

Setting and Sample

The research sample was selected from a retrospective group of foster care youth in a single program with oversight of 5 counties in a single Midwest State. Across all datasets, 13,646 unique points of data were available on a total of 2,146 foster care youths. Data were cleaned and merged across those who received care from October 1st, 20017 to September 30th, 2022. The total sample size for individual level data for this study was determined by those who met the following inclusion/exclusion criteria. Inclusion criteria for Aim 1 is any youth with completed initial intake assessment during

study period. The sample size was determined after duplicate data and incomplete individual level data were removed. The final sample size for Aim 1 equaled 2,146 participants. Any of the study population with data collected on the individual level at a second interval assessment point was utilized for Aim 2. The actual sample size (n = 1444) represented 67% of this study sample. The sample population includes all youth ages 0-18 years of age from October 1st, 2017 to September 30th, 2022 who had a completed intake into the system represented by completed intake forms. Exclusion criteria were any youth that did not have completed intake forms. These forms are identified as the LS1 and New Intake Log and a copy of each can be found in Appendix A.

The researcher supports Aim 2 through a temporal comparative analysis of the selected population of foster care youth at different points throughout the WAW program and identified research population specific variables of well-being in those on psychotropic medications. The total number of cases used for analysis depended upon the data available for each variable. For Aim 2(a) there were 1234 youth with data regarding medical home and PPP. For Aim 2 (b) there were 549 youth with data regarding psychological evaluation, and for Aim 2(c) there were only 35 individuals with data regarding IEP. Comparative analysis of the youth at different points in the WAW program aimed to identify the association of comprehensive care to identified well-being domains. For this population, the LS1, New Intake Log and Psychotropic Medication logs are routinely collected through Missouri State Children's Division to track foster youth involved in the WAW program by the Children's Permanency Partnership.

Data Utilization

The data collection includes data for stratification of the sample population based on the sociodemographic variables at the individual level. In Aim 1 the sociodemographic variables outlined in this section were collected and the association of the variable was made to the presence of psychotropic medications prescribed.

To support Aim 2 the variables outlined in this section were collected and are identified in Table 1 including the well-being domain they represent. These domains of well-being include physical health and development, social functioning, behavioral and emotional functioning, and cognitive development. These align with the domains of well-being laid out by the ACF correlate to the biopsychosocial treatment recommended by the AACAP and are adapted from the framework of resilience (American Academy of Child and Adolescent Psychiatry, 2012; Lou et al., 2008). The idea of well-being for this research is objectively measured by the presence, or absence, of the variables in all four domains of well-being as defined here. A table of the definitions with their corresponding well-being domain can be found in Table 1.

Variables of Interest

Sociodemographic

Age. Age is identified at the time of intake as identified on the LS1 as date of birth. Age is calculated and a new column created based on date of birth subtracted from the date of LS1 completion.

Race. Race is identified at the time of intake on the LS1 form as categorical race for the individual foster child. Race is defined as White, African American, American Indian/Alaskan Native, and Multiracial.

Sex. Sex is identified at the time of intake on the LS1 form categorically as male/female/other.

Zip code. Zip code is identified as the primary residence of the foster care youth at the time of intake.

Physical Health and Development Domain

Presence of Comprehensive Post Placement Physical (PPP). PPP is identified on the LS1 as 30-day HCY. Response is recorded as yes or no. It is a measure of the presence or absence of a comprehensive medical examination within 30 days of entering into the child welfare system.

Presence of a Medical Home. Presence of Medical Home is identified on the WAW New Intake Log. Response is recorded as yes or no.

Range of BMI. Range of BMI is calculated by height and weight data on the WAW Psychotropic Medications Form. Height and weight variables were inspected and corrected as needed to ensure values reported in imperial measurement (pounds and inches). Height and weight variables were then utilized to compute a new variable for BMI using the following formula (weight in pounds / (height in inches * height in inches) * 703) through SPSS compute variable function. The range for BMI is an accepted measure within the United States to determine if an individual is under or overweight. Based on CDC classifications, normal range BMI is 18.5-24.9kg/m2. Overweight is 25-29.8kg/m2 and obese is >30 kg/m2.

Social Functioning Domain

Number of Placements. Number of Placements is identified on the LS1 and defined as the number of times the placement changes for the individual foster child. A placement change occurs any time a child moves from one physical residence to the next, including foster homes, kinship homes, residential treatment, or group homes.

Behavioral and Emotional Functioning Domain

Presence of Psychological Evaluation. Presence of Psychological Evaluation is identified on the WAW Psychotropic Medication Form. It is defined as the presence of a psychological evaluation documented by a provider. Response is recorded as yes/no.

Range of Psychotropic Medications Prescribed. Range of Psychotropic Medications is identified on the WAW Psychotropic Medication Form. Response is no medications prescribed, 1-2 medications prescribed, 3-4 medications prescribed and 5+ medications prescribed.

Cognitive Functioning Domain

Presence of Mental Health Diagnosis(es). Presence of Mental Health Diagnosis(es) is identified on WAW Psychotropic Medication Form. It is defined as the presence, or absence, of mental health diagnosis(es) in foster care youth. Response is yes for any of the following diagnoses: ADHD, Post Traumatic Stress Disorder (PTSD), Bipolar Disorder, Major Depressive Disorder, Autism Spectrum Disorder, Anxiety, Mood/Conduct Disorders (Disruptive Mood Dysregulation, Conduct Disorder, Affective Disorder, Oppositional Defiant Disorder), Sleep Disorder, Borderline Personality Disorder and Reactive Attachment Disorder). Diagnosis(es) are collected on the Psychotropic Medication Form.

Presence of an Individualized Education Program (IEP). Presence of an IEP is identified on the Biopsychosocial Assessment form. It is defined as the presence, or absence, of an IEP. Response is recorded as yes/no. Type of IEP was recorded as for learning, behaviors, or both.

Analysis

The data were merged and limited to a data set that provided continuity on individual level data throughout the different data collection forms. An excel spreadsheet was used for data merging and merged data were made ready for analytic software upload. Data were analyzed with the use of SPSS software. Individual duplicate data were removed through true/false syntax in excel. Height and weight were converted to imperial measurements and an additional column was added to calculate BMI based on standardized calculation for height and weight.

To support Aim 1, the association of the sociodemographic factors at the time of intake into the WAW program with psychotropic medications prescribed to foster care youth was identified. The association was determined through a preliminary data analysis of descriptive frequencies, means and standard deviations between the groups of foster care youth. Data were then stratified to examine the associations in a stepwise linear regression to identify predictive values to psychotropic medication prescribing. For this analysis, the independent variables include age, sex, race, zip code, previous medical home, and BMI; dependent variables are the presence of psychotropic medications prescribed based on the presence of any range of medications prescribed.

For Aim 2, the researcher utilized a subset of the larger population including only those foster care youth that had multiple intakes over the course of the data collection period. A minimum of two separate timepoints of completed data are needed for comparison. Aim 2(a) identifies the association of the presence of protective factors of PPP and medical home on individual well-being. A group comparison between those with PPP (yes/no) and those with medical home (yes/no) was completed using independent sample *t* tests for the outcome measures of range of BMI and number of placements. Aim 2(b) identifies the association of the presence of the protective factor psychological evaluation on psychotropic medication prescribing to foster care youth. An independent *t* test was used to analyze the groups; identified as those who received psychological evaluation and those who did not receive psychological evaluation. Aim 2(c) identifies the association of presence of mental health diagnoses with presence of an IEP. Chi-squared and descriptive analysis was used to identify the percentage of foster care youth that qualify for IEP based on diagnosis and of those with an IEP present.

The researcher intends through this data analysis to demonstrate the significance of protective factors on domains of well-being for foster care youth. Based on outcomes from other Wraparound care models, the researcher hypothesizes that the presence of a PPP, a medical home, increased psychological evaluations and presence of mental health diagnosis(es) will positively influence the range of BMI, decrease the number of placements, decrease the range of psychotropic medications, and increase the presence of an IEP for foster care youth in this WAW program.

Chapter 4: Study Findings

Preliminary Data Analyses and Demographic Characteristics

The initial merged data set included 13,646 individual data collection points from 2,146 youths. Age data is dispersed from 0 to 21 years of age and is representative of the age at the time of data collection. The mean age of the sample is 7.81years. The sex data is representative of sex assigned at birth and included 44% females and 43.4% males with 12.7% of participants missing data. Caucasian race was identified for 48.8% of participants, African American by 30.4%, and Multiracial by 2.2%, with 18.3% missing race data. The descriptive statistics for the study population can be found in Table 3 and is representative of foster care youth in the state of Missouri followed by CPP from October 2017 to September 2022. The zip code data on this table is presented at the county level and is representative of the county of residence at the time of initial custody. 34.5% were from Jefferson County, 22.2% from St. Louis City, 18.3% from St. Louis County, 6.5 % from St. Charles County and 5.9% from Washington County. St. Francois County is included; however, the n was insignificant. The mean BMI for study population is 24±7.97 and mean placement count is 3.13±3.49. The range of psychotropic medication in this study were 41.1%(n=882) with 1-2 psychotropic medications prescribed, 19.1% (n=409) with 3-4 psychotropic medications prescribed, and 7.1% (n=153) had 5 or more psychotropic medications prescribed. The overall percentage of youths in this study that were prescribed psychotropic medication was 67.3%. The percentage of the youth per county with psychotropic medications prescribed is 87% of youth from St. Louis County, 68% of youth from St. Charles County, 62% of youth from

Jefferson County, 58% of youths from Washington County, and 55% of youths from St. Louis City.

When examining how variables of interest are related, differences in psychotropic medication prescribing were investigated across age, sex, and race/ethnic background. The mean age of those prescribed psychotropic medications in this analysis is 12.32 years (SD±4.09). Male gender was consistently higher in all ranges of medications prescribed, accounting for 51% of those prescribed 1-2 psychotropic medications, 59% of those with 2-3 psychotropic medications prescribed and 55% of those prescribed 5+ psychotropic medications. White race represents the majority for each range of psychotropic medication prescribed, representing 58% of those prescribed 1-2 psychotropic medications, 55% of those prescribed 3-4 medications, and 65% of those prescribed 5+ psychotropic medications. African Americans represent the next highest group, accounting for 41% of those prescribed 1-2 psychotropic medications, 44% for those prescribed 3-4 psychotropic medications and 34% of those prescribed 5+ psychotropic medications.

To determine correlation of the variables used in this study, a bivariate correlation was run, and results are available in Table 4. Pearson correlation coefficient was computed to determine the relationship between the psychotropic medications and age, race, sex, zip code, presence of medical home and BMI. Significance is determined at p value <.05. A significant correlation is seen for age, [r(1704)=.530, p<.001], sex [r(1704)=.008, p<.001] and BMI [r(1111)=.227, p<.001].

Aim 1 Analysis

The analysis for **Aim 1 examined the association of sociodemographic factors (age, sex, race, zip code), presence of medical home and BMI at the time of intake into the WAW program with psychotropic medication prescribing.** A multivariate stepwise linear regression analysis was completed and cases with missing data were removed automatically through the analysis in a listwise fashion. This identified 16.3% of variance in psychotropic medication prescribing can be attributed to the variables age, race, sex, zip code, presence of medical home, and BMI [$F(6,146)=4.751$, $p<.001$, $R^2=.163$]. These combined variables have a statistically significant association to psychotropic medication prescribing. The output from this analysis is available in Table 5. Individual variable significance was identified by a $p<.05$. A significant variance in psychotropic medication prescribing is due to the variables age ($p=.016$) and BMI ($p=.031$). No significant change is seen in psychotropic medication prescribing due to zip code ($p=.742$). Correlations were not made for race, sex, and presence of medical home due to noncontinuous measures.

Aim 2(a) Analysis

For Aim 2 (a) two independent t-tests were completed to **identify the association of the presence of a PPP and a medical home with range of BMI and the number of placements for foster care youth.** The initial independent t-test was used to identify if presence of PPP led to difference in BMI and number of placements. There is no statistically significant difference in BMI between those with presence of PPP and those without presence of PPP [$t(1109)=1.09$, $p=.14$]. The BMI for the PPP group (M=23.89; SD=7.87) was lower, however not statistically significant and for those without PPP (M=24.65; SD=8.53). There is a statistically significant difference between those with

and without PPP on the number of placements, with those who have had a PPP experiencing an average of 1.78 more placements than those without PPP [$t(3786.18)=-38.36$, $p<.001$]. This output table is found in Table 6. The mean placement count for those with a PPP was 3.24 (SD=3.57) and for those without PPP 1.46 (SD=.66). For the second independent t-test the presence of a medical home was looked at with regard to change in BMI and number of placements. For the presence of a medical home there is a statistically significant difference in BMI for those with a medical home versus those without [$t(53.16)=-4.96$, $p< .001$]. The BMI for those with medical home was on average 27.70 kg/m2 (SD=8.48) versus those with no identified medical home on average 21.00 kg/m^2 (SD=4.82) with an average decrease in variation of BMI of 6.7kg/m2 for those without the presence of a medical home at the time of entry into WAW. There is a statistically significant difference in those with and without the presence of a medical home on the number of placements [$t(2645)=-6.16$, $p<.001$). The number of placements of those with presence of medical home (M=2.32; SD 1.62) and those without presence of medical home (M=1.95; SD=1.42) This output is available in Table 7.

Aim 2(b) Analysis

For Aim 2(b) an independent t-test was performed to **identify the association of the presence of psychological evaluations with the range of psychotropic medications prescribed to foster care youth.** The association was statistically significant with those not receiving psychological evaluations prescribed .73 less psychotropic medications [$t(1901)=-17.882$, $p<.001$). Those with psychological evaluation present (M=2.65; SD=.74) had on average .73 more psychotropic medications

prescribed than those without psychological evaluation (M=1.92; SD=.832). The output for this test is available in Table 8. To further understand the change in range of psychotropic medications, descriptive statistics were applied and showed that the number of foster care youth prescribed psychotropic medications was 67.3% (n=1444). The presence of psychological evaluations was identified in 38% (n=549) of those prescribed psychotropic medications. Of those that received a psychological evaluation, 22% received repeat evaluation and were assessed for changes in the range of psychotropic medications prescribed. There was an increase in range of psychotropic medications prescribed in 22.7% (n=27) of foster care youth, a decrease in the range of psychotropic medications prescribed in 13.4% (n=16) of foster care youth, and no change in the range of psychotropic medications prescribed in 63.9% (n=76) of foster care youth.

Aim 2(c) Analysis

The final analysis for Aim 2(c) was to **determine if the establishment of mental health diagnosis was associated with an IEP.** For this analysis chi-square analysis was completed. The diagnoses present that identified the foster care youth eligible for and IEP included ADHD, Post Traumatic Stress Disorder (PTSD), Bipolar Disorder, Major Depressive Disorder, Autism Spectrum Disorder, Anxiety, Disruptive Mood Dysregulation Disorder, Conduct Disorder, Affective Disorder and Oppositional Defiant Disorder. The data set was limited to those foster care youth that had information available regarding IEP. For this evaluation n=35 and is limited to those youths that had a completed biopsychosocial assessment. Of this subgroup, 77% (*n*=27) had an IEP present. The chi-square analysis identified no relationship between diagnosis and presence of IEP, ($x^2(1,n=130=1.68$, $p=.196$). Of the sample of youth with an IEP, 93% had

the presence of diagnosis consistent with need for IEP. There was a small percentage, 6.6%, that had an IEP present without a specific diagnosis identified. Of those without the presence of IEP, 22.6% were identified to have a diagnosis that made them eligible for the presence of an IEP. There was insufficient data on type of IEP and diagnosis to determine if an IEP for learning, behavior or both was present and aligned with diagnoses.

These analyses create the preliminary outcomes data for CPP in regard to the protective and risk factors that are present for foster care youth. The interpretation and discussion of these results will provide an understanding of the clinical implications of this research.

Chapter 5: Discussion

Findings from this analysis contribute to the current understanding of the risk and protective factors to well-being in foster care youth in this WAW program. The identification of the characteristics of the individual youth provides a greater understanding of the strengths and needs of each child and provides a framework to promote well-being. The key findings for each analysis are summarized here, including the limitations of the study, future directions for research and the clinical implications of the research.

Discussion of Key Findings:

The analysis of the association of psychotropic medication prescribing with age, sex, race, zip code, BMI, and presence of medical home, Aim 1 of this research, reported variability in the association for each. Caucasian race is also predictive of any type of psychotropic medication prescribed and African American are more likely to be prescribed antipsychotics (Bozzi et al., 2022; Candon et al., 2021). The data for this analysis is limited to the presence and range of psychotropic medications prescribed with no data regarding drug class which limits the ability to make comparisons to previous findings. The association of these variables with a specific class of medication would provide additional insight into individual risks.

Consistent with previous research, age 12 years and older and male sex were identified as predictive variables of psychotropic medication prescribing in this program of care. Previous research which has estimated that children 5 years of age and younger compromise the smallest proportion of foster care youth prescribed psychotropic

medications with prescribing rates increasing after 10 years of age (Antoniou et al., 2023; Kim et al., 2021). These findings emphasize the need for ongoing medication oversight for all ages and highlights the young age at which these medications are started. Previous research has shown that, even though the significance of psychotropic medication prescribing increases at older ages, there is still a gradual increase in prescribing that starts as young as 3 years of age (dosReis et al., 2014). Unfortunately, the data available for the current analysis provided no information about the age of onset of medications prescribed and the association with long term use.

Findings related to sex in this study are also consistent with previous research, which suggest adolescent males are predictive of any psychotropic medication prescribing, and females are predictive of antidepressant prescribing (dosReis et al., 2016; Zito et al., 2021). Previous research has demonstrated sex variation by drug class, however, drug class for participants was outside the scope of the current study. The variable sex, although significant, does not provide information on what that significance means in practice. Lack of drug classification in this research limits the ability to compare findings to previous work. Females have previously been shown to have higher rates of antidepressant and anxiolytic medications prescribed with males demonstrating higher rates of stimulant and antipsychotic medication prescribed (Antoniou et al., 2023; Zito et al., 2021). These findings are significant to understanding the resources needed to support safe medication practices. Medication oversight needs to be tailored to the medications that are prescribed, and although sex is a predictor of medication prescribing, more information is needed to apply to clinical practice.

Race was not found to be significantly associated with the number of psychotropic medications prescribed in this study. Previous research has demonstrated overall lower psychotropic medication prescribing in minority populations, however, demonstrated higher rates of prescribing specific classes of medications, specifically antipsychotics, to minorities with a diagnosis of unruly behaviors and conduct disorders (Antoniou et al., 2023; Armstrong-Hoskowitz et al., 2020; Candon et al., 2021). Medication classification was beyond the scope of the current research making drug class and race predictions unavailable . Caucasian race is identified more frequently in those prescribed psychotropic medications in this study; however, the association is not significant.

This research found no significance in the association between zip code and prescribing of psychotropic medication. County level associations with prescribing rates identify the highest prescribing rates in youth from St. Louis County at the time of intake and the lowest prescribing rates in youth from St. Louis City at the time of intake. The findings are not significant enough to make assumptions based on county of residence to psychotropic medication prescribing. Additional comparison to geographic coding from census classifications of area by zip code would provide insight into the rural versus urban prescribing practices and could bring additional insight into the association with medical home. Previous research has demonstrated an association of prescribing of certain medications based on socioeconomic data and have associated lower income neighborhoods with higher rates of antipsychotic medication prescribing (Antoniou et al., 2023). Lack of classification of medications prescribed limited comparison of current research findings.

BMI was associated with psychotropic medication prescribing in this study. This positive correlation identifies an additional risk factor for those youth that are prescribed psychotropic medications. Higher BMI is associated with a higher risk for negative health care outcomes. Previous research findings for BMI report foster care youth, specifically for those in residential placement, have a higher prevalence of obesity, however, there is no data regarding associations to BMI at intake into the foster care system (Schneiderman et al., 2013). Identification of elevated BMI provides an opportunity to define the individual risk related to medication prescribing and other physical and mental health issues. Earlier identification of rising BMI allows for target interventions to prevent continued progression to obese range.

Medical home has been identified throughout research as a protective factor and presence of medical home at intake is associated with other predictor variables but was not predictive of psychotropic medications being prescribed. The association of medical home is further discussed with the analysis of Aim 2.

The associations for the Aim 2 analysis identified variable associations between PPP and medical home to BMI and number of placements. The presence of a PPP had no association to BMI. This association may change over time, however multiple data points for BMI were not available for comparison. The number of those identified as having a PPP was greater, therefore providing more data for those with PPP present and may have contributed to the overall findings. BMI was reported in 956 subjects with presence of PPP and only 155 subjects without PPP identified had a BMI recorded. There is, however, an identified positive association with those youth who enter WAW with a higher BMI, with these youths more likely to be prescribed psychotropic medications,

however, lack of BMI data prevents comparison of BMI at different times in their care. BMI was found to have a positive correlation to the presence of a medical home with a mean increase of 6.70kg/m2. The best treatment for obesity is prevention, however those youth who had an identified medical home prior to coming into the welfare system, were not afforded the protective factor that is provided by a medical home and preventative care. This is inconsistent with previous research that finds Wraparound models of care positively influence health outcomes (Boel-Studt et al., 2020; Bozi et al., 2022). A higher BMI can negatively influence health outcomes and provides additional risk to prescribing psychotropic medications than those with normal BMI (Patton et al., 2019; Schneiderman et al., 2013).

Identification of factors that can impact the number of placements can provide significant benefit to the foster care youth. This analysis, however, failed to identify PPP or medical home as a significant factor to decreasing the number of placements These associations failed to show a correlation to protective factors in ongoing care. The protective factors that the previous medical home provides are no longer sustained once a part of the foster care system, and these protective factors need to be reestablished. Access to ongoing care, like presence of a PPP, did not demonstrate the protective factors assumed from ongoing care. The PPP offers support and access to ongoing care for the foster care youth and their family, potentially minimizing the risk for displacement, however these were not found in this study population. The connection to care provides access to resources in the environment of the child and promotes resilience in the youth. More research regarding this correlation is needed as previous research has also shown support for the benefits of preventative care on overall health outcomes and well-being

(Alwash et al., 2022; Kim et al., 2021). The limited data available on individual long-term care may have contributed to the lack of significance PPP and ongoing care has on foster care youth.

When examining Aim 2(b), the presence of psychological evaluations was associated with the number of medications prescribed. The use of psychological evaluations was predicted to decrease the number of medications prescribed, and the finding support this with a mean decrease in the number of psychotropic medications prescribed . Previous findings have reported a decrease in the number of medications prescribed with an increase in overall functioning in those that utilized psychological support services, however, these findings were not reproduced in this population (Leathers et al., 2021). This associated decrease in rate of prescribing could be better defined with more data collection points. The reported use of services was limited to the dates on a single intake and it is unclear if there was additional utilization of support services between the dates that were captured for tracking purposes. This analysis would also be strengthened by understanding the actual number of evaluations for each youth and the number of medications prescribed with each evaluation.

The current analysis is consistent with previous findings on overall utilization of psychological services, identifying less frequent use of services than expected based on the percentage of youth prescribed psychotropic medication and the current prescribing guidelines (American Academy of Adolescent and Child Psychiatry, 2023). For the youth in WAW, however, more than half of the youths that received an initial psychological evaluation, had repeat services documented. This rate of ongoing utilization varies throughout the literature, with reported ranges from 7%-75% depending on the

population studied (Antoniou et al., 2023; Barnett et al., 2019; dosReis et al., 2016; Kim et al., 2021). Repeated use of psychological services is associated with better health outcomes and this WAW program demonstrates increased access to ongoing care for youth involved in this program.

The final analysis for Aim 2(c) did not support a positive association between diagnosis and presence of an IEP. The use of IEP is not significantly associated with presence of diagnosis; however, IEP use was identified in the majority of youth who were deemed eligible. The sample size for this analysis was a limited number of the overall population and may have contributed to lack of significant findings. IEP use has been explored as a tool to support trauma informed care for youths on psychotropic medications and the WAW program facilitates access to this education supportive services (Sadin, 2022). The current literature identifies the importance of IEP use for different diagnoses and the importance of trauma informed creation, however, there is a lack of research that explores IEP use specifically in foster care youth and the impact on their educational outcomes. The focus of well-being for foster care youth has been on immediate safety, and as we expand the strengths-based model of care to encompass all domains of well-being, the specific impact of IEP use in this population needs to be explored further.

These research findings only partially support the proposed model of well-being defined for this research, however, provide significant contributions to the outcomes for this WAW program of care. The protective factors that are provided through the WAW program demonstrate increased access to care. Although there was not an identified measurable improvement through BMI or decrease in number of placements, the

establishment of care was demonstrated in the majority of subjects with 91% of subjects receiving care through a PPPs. The psychological care that is received by the subjects in WAW also demonstrates protection by a reported decrease in number of psychotropic medications and repeated access to psychological services once services were initiated. These protective factors over time may diminish the effect of the risk factors foster care placement puts on overall well-being. Further analysis is needed to identify the reproducibility of these findings in the current WAW program and to provide strength for the generalization of these findings to other foster care youth.

Limitations

The results of this study provide a preliminary assessment of the outcomes of those in the WAW program; however, outcomes are limited due to challenging data availability and management, significant amounts of missing data, and the lack of continued repeated measurements on the individual level that are transferable across the various domains of well-being. The data collection methods that are used to monitor and assess foster care youth are for tracking purposes and were not designed for research or evaluation intent. Therefore, consistent, repeated, and measurable data is difficult to collect. The outcome data for this analysis were pulled from multiple databases with varying data collection tools, varying degrees of completeness, and significant inconsistency in reporting (i.e., missingness). The required data needed for each analysis was self-limited due to missing or incomplete data reducing the number of youths analyzed and limiting the overall generalizability of the analysis. This not only limits the ability to identify measurable outcomes within the group but makes comparison to other models of care difficult. Another limitation to this data is that the ability to receive care

may have been impacted by the Coronavirus pandemic. The data set spans prior to onset of the pandemic, however, the impact of the pandemic is unknown on the data collection, reporting, and overall access to care.

Future Directions

The benefits of WAW are demonstrated in this analysis, however, its significance to the foster care population overall could be improved with continued analysis of these outcomes. A prospective study on foster care youth in the WAW program that measures specific outcomes over time could provide a greater understanding of the strength of these associations and the long-term impact on health outcomes. Ongoing information regarding sociodemographic variables regarding risk factors like psychotropic medication prescribing practices, types of medications and repeated BMI measurements, as well as protective factors like occurrence data of ongoing medical and psychological care, provide a framework to monitor programmatic impact on the individual foster care child.

Current data collection strategies provide limited ability to make data readily shared or analyzed. Specific data collection methods are recommended but not mandated by federal or state guidelines leaving great variability. The caseworkers that often collect that data for tracking purposes require additional support to ensure consistency in data collection and reporting. Previous research has demonstrated that caseworkers indicate time and lack of training as barriers to meeting any goals outside of the basic safety needs of foster care youth (Hughes et al., 2020; Leathers et al., 2021). Programmatic oversight should include an ability to easily share and retrieve data. This research could be used to develop a framework for data collection to track outcomes of well-being and could be adapted from the current tracking tools in child welfare reporting. This type of data

capture would require a technology understanding not necessarily required for the role of a caseworker, therefore, program creation needs to identify technology support not only during program creation, but for ongoing data collection and analysis.

Clinical Implications

The oversight of care for foster care youth is a complicated process that includes multiple, and often changing, parts. Facilitation of access to care and medication management are critical components of care. This research provides support for the WAW program to provide access, continuity, and oversight to the foster care population. These findings can be utilized to provide ongoing support for program development and provide support for variables to measure program outcomes in this, and potentially other Wraparound models of care. This type of structured program that encompasses the care received needs to provide ongoing data to measure not only program outcomes but allow for improved continuity in care aimed at improving the individual foster care youth's well-being.

Conclusion

Foster care youth deserve a model of care that identifies the risk and protective factors to their well-being. WAW represents this model for foster care youth in five counties in Missouri. Identifying the risk and protective factors provides a comprehensive framework of support for the foster care youth, the caseworkers, and the foster families that provide the day-to-day oversight of care. Youth placed in foster care experience a disruption to their environment by entering into the child welfare system. Understanding what systems were in place at the time of removal from the home contributes to the

development of an individualized strengths-based model of comprehensive care. The theoretical framework for this research explores the environmental influences that can affect the balance of protective and risk factors that exist for foster care youth and supports the individual's strength. Concepts from the fields of social work and psychology provide the framework that identifies the benefits of WAW on individual outcomes and define the measurable components of well-being.

This research supports the use of strengths-based models of care by identifying the significance of individual risk and protective factors present as the youth enters into foster care. Assessment of these characteristics provides the baseline understanding of comprehensive needs for ongoing care. The risk factors for psychotropic medications prescribed as the youth enters into this comprehensive program include increasing age, male sex, and higher reported BMI. Protective factors from the WAW program for those prescribed psychotropic medications were identified as presence of and ongoing psychological evaluations. Youth in the WAW program did not demonstrate improved outcomes in care as measured by BMI and number of placements, however, did demonstrate access to psychological care decreased psychotropic medications prescribed and increased utilization of ongoing psychological care once services were initiated. These protective factors have been associated with improved health outcomes and are made accessible to youths as a part of the WAW model of care. Although further research is needed to identify the ongoing validity of these findings in the WAW program, this data provides an initial assessment of the individual benefits that are provided from this model of care.

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Table 1: Variable Definitions

Variable	Theoretical Definition	Operational Definition	Well-Being Outcome	Resilience Framework Concept
Presence of post-placement physical (PPP)	Comprehensive medical examination by a provider specialized in care of pediatric patients	The presence or absence of individual foster child's completion of a comprehensive physical within 30 days of placement into custody	Physical Health and Development Social Functioning	Protective
Presence of medical home	Comprehensive, holistic, person-centered, team-driven approach to service delivery	The identification of a medical home at the intake into county custody	Physical Health and Development	Protective
Range of body mass index (BMI)	Child's weight in pounds and height in inches calculated to equal BMI as measured in kg/m2. (weight in pounds / (height in inches * height in inches) * 703)	The calculation of the individual's BMI that occurs at the intake into county custody.	Physical Health and Development	Risk
Number of placements	The number of times that a child changes residence while in county custody	The number of placements noted in the individual record	Social Functioning	Risk
Presence of psychological evaluation(s)	Comprehensive psychological evaluation by a provider specialized in the mental health of pediatric patients	The individual	Behavioral/ Emotional Functioning	Protective
Range of psychotropic medications	Specific range of medications prescribed with intent to affect behavior, mood, thoughts, or perceptions.	The range of psychotropic medications an individual is prescribed aligning with 1 of 4 groups (1=none, 2=1-2 medications prescribed, 3=3-4 medications prescribed, 4=5+ medications prescribed	Behavioral/ Emotional Functioning	Risk
Presence mental health diagnosis(es)	Specific diagnosis for child including ADHD, PTSD, Bipolar DO, Major Depressive DO, Autism Spectrum DO, Anxiety, Mood/Conduct DO (Disruptive Mood Dysregulation, Conduct DO,	The number of individual diagnoses for the child at the time of intake into county custody and any documented follow up visit (PPP	Cognitive Functioning	Protective

	Affective DO, ODD), Sleep Disorder, Borderline Personality DO, Reactive Attachment DO).	or psychological evaluation)		
Presence of individualized education plan (IEP)	School based plan for special education instructions, supports and services needed to thrive in school	Identification of an IEP that supports the educational and behavioral needs of the youth noted at intake into county custody or documented at any follow up visits (PPP or psychological evaluation)	Cognitive Functioning	Protective

Table 2: Comprehensive Review of Literature for Variable Related to Foster Care Youth on Psychotropic Medications

Source	Study Aim	Study Population	Methodology	Level of Evidence	Major Findings
Ahn & Putnam-Hornstein (2021)	Identify risks associated with exiting care without permanency. Specifically, the authors identify an algorithmic decision aid to identify foster care youth at risk for aging out without permanency	Youth born between 1991-2000 who spent at least 1 day in foster care under California's Child Welfare Services between 12- and 14-year-old, n=78,136	Secondary data analysis of child welfare services database in California spanning 28 years of data	Level IV	Youth without permanency are more likely to experience housing instability and homelessness, barriers to healthcare access, difficulties in higher education, earlier pregnancy rates and increased physical and mental health issues than peers. A greater percentage African American foster youth are without permanency (White 36.6%; **African American 48.5%;** Hispanic/Latino 35.3%; Asian/Pacific Islander 30.8%; Native American 42.1%; Missing 48.8%)
Alwash & Palusci (2022)	Identify the characteristics of those brought into custody for neglect, specifically medical neglect, and identify services provided and impact on recurrence of neglect	All children with reported medical neglect in the National Child Abuse and Neglect Data System (NCANDS) during 2012-2017, n=91,526	A cross-sectional design was used to identify factors associated with CPS referral to foster care and adoption services, and a longitudinal cohort design was used to assess recurrence within five years	Level IV	There were increased rates of recurrence of neglect in children who were 3–18 years old during their first report, were African American, or had medical problems. Decreased recurrence was associated with being White or having behavioral problems. Families with financial problems, utilizing public assistance, or who had caregivers with a physical disability or other unspecified medical problem had higher rates of recurrence. African American children are more likely to have recurrent neglect due to the contributing factors of poverty, lack of medical resources, geographical factors, institutional and individual racial bias and discrimination. Logistic regression models used to assess predictive value of variables. Variables included had $p \leq .05$

Antoniou, Mamdani, Gomes, McCormack, Kitchen, Gardner, Lunsky, Tradrous, Jurlink, Pajer & Penner (2023)	Identify to extent of geographic variability in prescription psychotropic dispensing to children and youth and identify the sociodemographic correlates of use	Children aged 0-24 that received psychotropic medication in 2018 in Ontario as identified by the Ontario Drug Benefit (ODB), n=306,470	Retrospective population-based analysis of claims using the Ontario Drug Benefit database, comorbidity and prevalence data from the Ontario Health Insurance Plan database, diagnostic data from hospital reporting databases and regional density estimations from registered provides	Level IV	Antipsychotic prescribing rates were inversely associated with neighborhood income and were highest in the lowest income neighborhoods of Ontario (17.3% vs. 26.0%; RR 0.72, 95% 0.70 to 0.75). Antipsychotics are primarily used for the management of non-psychotic disorders and externalizing symptoms in children and youth, require regular monitoring for adverse metabolic effects, and have been associated with an increased risk of death. Greater likelihood of diagnosis with conduct or oppositional defiance disorders among low-income African American and Hispanic American youth relative to non-Hispanic white children and youth.
Armstrong-Hoskowitz, Schmidt, Henderson, Nelson & Allen (2020)	Identify whether psychotropic medication use decreased delinquent behaviors and affected involvement in the juvenile justice system	A subset of the National Study of Child and Adolescent Well-Being of youth >8yo with >4 discrete time points (NSCAW), n=2,065	Longitudinal field study from the National Study of Child and Adolescent Well-being over 7 years through a	Level III	Current study used an archival dataset to investigate the role of psychotropic for reducing delinquency and subsequent court involvement for a group of high-risk adolescents and identified there was no protective effect of psychotropic medication treatment of at-risk youth against engagement in delinquent behaviors over a seven-year time span. Latent growth curve modeling demonstrated the medication group exerted no effect on initial delinquent acts by youth (p=.961).

			multi-institutional collaborative		
Barnett, Jankowski & Truman (2019)	Examine the implementation and clinical outcomes of a multiyear project installing 2 evidence-based practices for trauma-exposed youth in community agencies across the state of New Hampshire	11 districts in New Hampshire Division for Children, Youth and Families included n=292 trainees and n=363 youth in the NH DCYF system	Implementation research identifying pre and post treatment trauma symptoms reporting after evidence-based practice implemented	Level III	Youth had improvement in post-traumatic stress symptoms after implementation of evidence-based practices. Clinically significant change scores were chosen based on those used for similar posttraumatic stress disorder (PTSD) measures with similar number of items and rating scales. 59% demonstrated clinically meaningful improvements.
Bertram (2018)	Identify the perceptions of foster youth with mental health needs and their support teams in care-planning and decision making	Participants from a Missouri consortium for foster care youth, n-34	Concurrent embedded design of purposeful qualitative selective research with quantitative analysis self-assessment component	Level V	Wellbeing, permanency, increased inclusion of family and youth as more involved participants in Child Welfare case planning, future planning for older youth, and tighter oversight, especially around medication management, became priorities for care planning. Quantitative analysis of empowerment scores in the context of qualitative coding of interviews.
Bertram & McKanry (2022a)(2022b)	Identify child welfare staff's perceptions of psychotropic medication use and the level of trauma responsiveness	Private foster care consortium and public sector child welfare agency in Missouri, n=24	Mixed method research intervention with training for child welfare staff with pre and post training	Level V	Identification of barriers to implementation of training and support needed to develop comprehensive care programs from a programmatic perspective based on the six design principles for delivering effective professional development focusing on trauma informed care.

			testing of the staff		
Boel-Studt & Schelbe (2020)	Describe subsets of younger children served in Therapeutic Residential Care (TRC) based on purposes for placement, treatment options and outcomes	Children aged 10 and younger admitted to a TRC between 2007-2012 in a large not-for-profit child welfare organization in the Midwest. N=216	A three-step latent class model was used to estimate conditional effects of class membership on impairment at discharge, length of stay, and discharge placement. A content analysis of a randomly selected sample of case records from each class was used to explore placement processes	Level IV	TRC did improve outcomes. For the child welfare group impairment at discharge was statistically significant, $p<0.05$. This group was identified as defiant (90.7%) and impulsive (88.4%) with high rates of physical assaults (83.7%) and poor relational skills (83.7%). They have increased exposure to adverse events at rates 4-5 times higher than other classes in the study. Poly-victimization was most highly with 81.4% experiencing 2-4 forms of maltreatment,
Bozzi, Shah & dosReis (2022a)(2022b)	Investigate the association between clustering of adverse community factors with psychotropic medication use	Foster care youth aged 5-18 years old in the US in 2014 with Medicaid medical and pharmacy claims, n=4334 with US Census	A retrospective cross-sectional design was used to evaluate psychotropic medication use in	Level IV	Community adversity is inversely associated with psychotropic use, even though areas with high community adversity had the highest provider density. The disproportionate access to providers (i.e., low supply) in low community adversity clusters may explain the relatively higher use (i.e., high demand) of psychotropic medication. Over half of the children in the low community adversity cluster received psychotherapy, compared to 43% in the high community adversity cluster. Also, the greater number of removals among children in the high

	among children in foster care in one US state.	and Kids Count data	calendar year 2014 in relation to indicators of community adversity.		community adversity cluster likely led to disruption and discontinuity in care. This may explain the lower use of psychotropic medications. The association between psychotropic use and community adversity was significant (estimate,−2.35; *p*=0.01).
Branscum & Richards (2022)	Identify predictors of running away from foster care as well as the recent trends in the prevalence and predictors of running from care	Adoption and Foster Care Analysis and Reporting System (AFCARS) data on youth in foster care age 1-23 years old from 2010 and 2019, n=597,911	Longitudinal trend analysis of Foster Care Analysis and Reporting System from the National Child Abuse and Neglect Data System 2010-2019	Level IV	Race is the strongest predictor of running away; 64% are African American, p <00.1. Foster youth that run away are more likely to demonstrate substance use, behavior problems and increased number of placements, *p*<.001
Candon, Shen, Fadeyibi, Smith & Rothbard (2021)	Identify the prescribing patterns of antipsychotics in Medicaid enrolled youth	Antipsychotic prescription data in Philadelphia Pennsylvania in age </= 21 years old in 2014 and 2018, n=5253, n=2688	Retrospective analysis of administrative claims data for Medicaid in Pennsylvania 2014-2018	Level IV	While the raw number of antipsychotic prescriptions for unapproved indications fell between 2014 and 2018, the share of antipsychotic prescribing for unapproved indications increased for female, African American and Hispanic Americans. Of those on antipsychotics without approved indication 58.5% were African American and 35% were in foster care, p <0.001.
Casanueva , Smith, Ringeisen, Dolan, Testa & Burfeind (2020)	Identify the children in out of home care who may qualify for early intervention and special education services are not receiving them	The National Survey of Child and Adolescent Well-Being, sponsored by the Administration on Children and Families, is a nationally representative sample of	Secondary analysis of national survey data as well as direct data collection through assessments of youth	Level V	Young children placed in voluntary kinship care with developmental, cognitive, or language delays identified in NSCAW assessments are significantly less likely to have an IFSP (4%) than similar children placed in nonrelative foster care (22%). Among children 3 to 17 years old, those placed in voluntary kinship care with cognitive or academic needs are significantly less likely to have an IEP (22%) than similar children placed in nonrelative foster care (54%). It is especially important to note that across all types of placements, most children involved with the CWS who potentially need these

		children aged 0-17 years of age reported to child protective services. The survey collects data on a representative sample of the child protective services population by administering questionnaires and direct child assessments through face-to-face interactions with caseworkers, children, and caregivers.			critical services do not receive them. These findings are statistically significant with a $p<0.05$.
Curtis McMillen, Carter Narendorf, Robinson, Havlicek, Fedoravicius, Bertram & McNelly (2015)	Identify the feasibility of an inversion and programmatic implementation of intervention	US-based private welfare foster care agency youth, n=7	A mixed method study that selectively randomized participants to receive treatment foster home intervention versus treatment as usual	Level III	Comprehensive interventions are feasible for foster care youth and are increasingly likely when stakeholders are involved in the intervention development process. Community resources and psychiatric oversight are needed in programmatic development.

Davis, Lohr, Feygin, Creel, Jawad, Jones, Williams, Le, Trace & Pasquenza (2021)	Describe high-level psychotropic polypharmacy (HLPP) use in children receiving Kentucky Medicaid and those in foster care in 2017.	Youth aged 6-17 years old enrolled on Kentucky Medicaid in 2017, n=1,700	A secondary analysis of a dataset of diagnostic, pharmaceutical, and demographic information was compiled using Kentucky Medicaid enrollment and billing claims 2012-2017 enrollment and billing claims data from 1/1/2012 through 12/31/2017	Level IV	The practice of concomitant medication use continues to grow in the treatment of children on Medicaid and in foster care despite efforts to safeguard their use. There is a statistically significant difference, p=0.001, in the utilization of outpatient care with foster care youth receiving less outpatient care and also a significant increase in use of ER and hospital visits in foster care youth, $p<0.001$.
dosReis, Tai, Goffman, Lynch, Reeves & Shaw (2014)	Investigate changes in the prevalence of psychotropic medication use by age in foster care youth	Medicaid claims of Mid-Atlantic state in <6 years old in foster care in 2009-2011, n=1491	A retrospective analysis of data from Medicaid claims for mental health and pharmacy services was used to determine the prevalence of psychotropic	Level IV	Psychotropic medication use is reported in early preschool foster care youth and prevalence increases with age. Multiple medications use is noted in as young as 4 years of age. 58% of 5-year-old in this study were on psychotropic medications and 77% of this group were on multiple medications. The utilization psychotherapy is lower than expected based on prescribing practices. 80% of African Americans in this study were on medication and more than 2/3 of this group carry the diagnosis of disruptive behavior disorder.

			medication use		
dosReis, Tai, Camelo & Reeves (2016)	Describe state Medicaid implementation strategies for psychotropic monitoring targeted youth	National analysis of existing monitoring programs for psychotropic monitoring programs targeting youth, n=28	A mixed method comparative effectiveness study of 38 state Medicaid programs implemented with the intent of psychotropic medication oversight	Level IV	Oversight varies by state with several states focusing only on antipsychotic medications. Foster youth are prescribed antipsychotics at higher rates than other youth. Prescribing of antipsychotics is often for off label use and does not align with best prescribing practices outlined by the American Academy of Child and Adolescent Psychiatry. There is lack of drug monitoring, specifically for metabolic conditions associated with drug use. Age was associated with significant increase in odds of antipsychotic use with $p \leq .05$ and antidepressant use was a predictor of antipsychotic use with $p \leq .05$.
Graham, Pears, Kim, Bruce & Fisher (2018)	Identify the intervention effects of Kids In Transition to School (KITS) Program on children's stress neurobiology	Kindergarteners in non-kinship or kinship foster care from 87 schools in two counties, n=156	A randomized controlled study measuring the salivary cortisol and preschool readiness of the KITS intervention group to a foster care comparison group	Level III	Findings indicated that the KITS intervention demonstrated an effect on HPA axis functioning for children in foster care during the critical and potentially challenging transition into formal schooling, which subsequently led to better adjustment to school. As hypothesized, children in foster care who received the KITS intervention showed a steeper diurnal cortisol slope on the first day of school (relative to baseline) compared to children in foster care receiving services as usual, p-.012
Hambrick, Oppenheim-Weller, N'Zi & Taussing (2016)	Identify what the literature reports for s guiding this review were: (1) Which “possibly efficacious” interventions	A literature review of peer reviewed empirical studies of possibly efficacious interventions	A comprehensive literature was completed and included foster care,	Level V	Research support found for 10 interventions that had been evaluated in foster care youth and found that the service systems in which children in foster care receive mental Health treatments are as diverse and complex as the clinical problems children in foster care face. Continued rigorous intervention research for children in foster care is critical, alongside equally rigorous research regarding how to

	have been evaluated with foster populations in outpatient settings, and what are their characteristics? (2) What is the status of the empirical support for these interventions? (3) What are the outcomes, and what subgroup/moderator analyses of outcomes have been conducted? And (4) What are the enrollment, retention, and attendance rates for these interventions? A narrative systematic review of the literature was employed to answer these questions.	delivered to 0- to 12-year-old children in foster care. Additional inclusion criteria included: (1) Intervention evidenced at least one positive child mental health outcome for children in foster care; (2) Intervention could be delivered in-home or in outpatient/community settings; (3) Intervention was not solely enhanced foster care or wraparound services (as defined by having at least one specific therapeutic component unique to the intervention); (4) Outcomes or engagement rates were measured	kin care, relative care, and out of home care that received an intervention, treatment, therapy or training		implement these interventions effectively. With ongoing research with this population, the hope is that future studies evaluating the utility of community-based mental Health services for children in foster care will show that indeed, receipt of services is beneficial for children in foster care.

		post-intervention, (5) Article reported on an evaluation of an intervention's efficacy or effectiveness (e.g., it was not a program evaluation); (6) Intervention could be delivered in English. N=10			
Kim, Barnhart, Garcia, Jung & Wu (2021)	Identify characteristics to predict utilization and dosage of mental health services and identify if these change over time in youth in the child welfare system	Child Welfare Service involved youth aged 13-17 years old in 2003-2005 and 2012-2014 in large mid-Atlantic city, n=5933; n=2389	A secondary analysis of administrative data on child welfare service involving youth in a Mid-Atlantic city was completed to identify whether rates and predictors of mental health services use in two cohorts has changed over the ten-year span.	Level IV	Mental health service utilization increased more than twofold between the two cohorts of child welfare service involving youth, $p<.001$. A negative correlation was noted with African Americans and mental health services with a decrease in utilization between cohorts, although findings were not significant. Placement instability is positively correlated with mental health assessment, however, is also associated with disruption in on going use, $p<0.05$.

Leathers, Vande Voort & Melka Kaffer (2021)	Identify the types of mental health services and psychotropic medications provided to children with increased risk of multiple placement changes	Children placed in a foster home age 8-24 years old identified as high risk for moves in Illinois, n=167	Descriptive analysis of interviews from randomly selected foster parents in a single state caring for who had multiple placement changes or met high risk for placement change criteria.	Level IV	The population study reported mental health diagnosis in two-thirds of those in the study and overall higher rates of severe and persistent mental health disorders. 28% reported diagnosis with persistent functional impairment indicating impact on well-being. Mental health diagnosis is associated with high use of psychotherapy with 90% of those with a diagnosis enrolled in therapy. IEP use is identified in over a third of children with a mental health diagnosis. A mental health diagnosis led to medication use in 94.7% of the population and over 20% of the antipsychotic medication use was for off label use
Muentner, Stone, Davis & Shlafer (2022)	Describe the prevalence and characteristics of youth at the intersection of parental incarceration and foster care	2019 Minnesota Student Survey of eighth, ninth and eleventh grades age 12-19 years old , n=112, 157, foster care n=3140	Descriptive analysis of the interaction between parental incarceration and foster care as predictors of youth mental health symptoms, diagnosis and treatment from data provided through the Minnesota Student Survey in the	Level IV	Both parental incarceration and foster care were separately linked with poor mental health, yet experiencing both was associated with higher odds of anxiety, depression, self-injury, suicidal ideation, suicide attempt, diagnosis, and treatment. Youth with proximal multiplicative exposure (recent foster care and current parental incarceration) reported the most adverse mental health symptoms, $p<0.001$

			2019 survey cycle		
Olsen, Benjamin, Azman, Kellog, Pullman, Suter & Bruns (2021)	Conduct meta-analysis of Wraparound focused on outcome evaluations	Studies on youth aged 3-21 years old that examined outcomes addressed by Wraparound using an experimental or quasi-experimental design published after 1991, n=17 articles	Meta-analysis of estimated effects on youth outcomes including symptoms, functioning, school, juvenile justice, residential placements and cost of Wraparound care.	Level I	A small but statistically significant effect for combined outcomes that favored the youth with Severe Emotional Disorders (SED) enrolled in Wraparound care. Effects of Wraparound care correlated to costs (p<.001), residential outcomes (p=.001) and school functioning (p=.007).
Osei & Gorey (2021)	Identify the impact of positive (protective) and negative (risk) influences and moderators of youths in group homes	Youth in group home care in the Ontario age 10-17 years old 2012-2013 and 2015-2016, n=875; n=182	Retrospective cohort analysis of data from the Ontario Looking after Children (OnLAC) database over three years to identify the influence of positive (protective) and negative (risk) peer influences in youth with	Level III	Peer influences are a predictor of risk or protection. Conduct disorders are most often associated with highest risks. More resourceful and higher income neighborhoods demonstrated protection over risky peer influences while low-income neighborhoods presented as a risk with the highest risk peer influences with a p<.05. Associations with positive peer influence was protective in high- and low-income neighborhood groups, p<0.5

			conduct problems residing in group homes and the ability of neighborhood income to moderate that relationship.		
Patton, Liu, Adelson & Lucenko (2019)	Identify the association of childhood adversity and health care costs	Youth enrolled in Medicaid in Washington State age 12-17 years old with a least one biological parent identified through administrative records July 2014-June 2015, n=181,176	A retrospective secondary analysis of data from the Department of Social and Health Services, Health Care Authority, State Patrol, Administrative Office of the Courts, Department of Corrections and the Department of Health to identify the significance of specific childhood adversities on	Level IV	Among the social determinants examined, child maltreatment, out-of-home placement, and placement instability had the largest cost impact to the Medicaid system (p<.001). These experiences were associated with higher use of behavioral health services, even when controlling for pre-existing behavioral health conditions. This study found that the adolescents with the highest health care costs tended to experience more parental acute childhood experiences (ACEs) compared to adolescents with lower expenses, which mirrors prior research demonstrating that more adverse experiences lead to a greater likelihood of negative health outcomes. The adolescents with the highest health care costs were 1.4-2.0 times more likely to have experienced at least five parent risk factors than the lower deciles, and 1.4-1.9 times more likely to have experienced abuse or neglect or 5 + out-of-home placements. Logistic regression used with p<0.001.

			health care costs		
Penarrubia, Navarro, Palacios & Fenollar-Cortes (2021)	Identify the association of placement variables with the cognitive and executive performance in foster care youth with ADHD	Youth aged 6-12 years old with diagnosis of ADHD in Spain, n=102, foster care n=59)	A case-controlled comparison of testing from the neuropsychological assessment of executive function in foster care youth and non-foster care youth	Level III	Children in foster care obtained lower scores in the general ability index than the control group after controlling the age at assessment. Foster care group was significantly different in symptoms and general ability index, p=0.018;p=0.036. However, no differences were found in executive processes. Regarding placement factors, children with shorter exposure to adversities in their birth families and more time in foster care showed better executive performance. Professionals should consider the placement history of children in foster care and its influence on their symptomatology and cognitive capacities.
Schneiderman, Arnold Clark, Smith, Duan & Fuentes (2013)	Identify the prevalence of obesity in foster care youth in California	Youth aged 2-19 years old in permanent Los Angelos County Division of Children and Family Services receiving care at Community-Based Assessment and Treatment Center 2006-2010, n=312	Secondary data analysis of the relationship of obesity to long term foster care and to establish the prevalence and sociodemographic variables of obesity in youth in foster care from a Community-Based Assessment and Treatment	Level IV	This study found that the prevalence of overweight and obesity in a sample of primarily Hispanic children in long term foster care was higher than a nationally representative sample and also higher compared to a study of children at their initial entry into foster care. Current findings compared to National Health and Nutrition Examination Survey (NHANES) Obesity: 23.4% current study vs. 16.9% in the NHANES; overweight/obesity: 39.7% in current vs. 31.7 in the NHANES.

			Center (CATC).		
Schurer Coldiron, Bruns & Quick (2017)	Aim to (1) thematically categorize Wraparound publications by study foci, purpose, research design, measures, and rigor; (2) synthesize and describe any patterns or trends in research studies and findings over time; (3) highlight potential implications from the existing research; and (4) identify needed areas of further study	A keyword search was performed with terms such as (Wraparound) AND ("Wrap-Around" OR "Wrap Around") AND (Wraparound Services) AND (Wraparound Process) AND (Intensive Community-based Services) AND (Intensive Care Management. N=206	A comprehensive literature review occurred July 2014 to March 2015 on literature published 1986-2014.	Level V	Given Wraparound's status as a flexible "operating system" for youth with many types of behavioral health and other needs, development and pilot testing of Wraparound variants could be extremely useful, allowing for change and adaptations to specific contexts on an ongoing basis in the context of small-scale or even large-scale implementation. The review showed that 14 of the 22 controlled studies found at least some evidence that favored use of Wraparound, and none found better outcomes for the comparison or treatment as usual.
Spinelli, Bruckner & Kisiel (2021)	Describe the frequency and distribution of trauma experiences (TEs) among Transition Age Youth (TAY) in the child welfare system in Illinois	Youth aged 14-21 years old in the care of Illinois Department of Children and Family Services and in out of home care >1 year, n=3,324	A retrospective secondary analysis of the Child and Adolescent Needs and Strengths (CANS) assessment	Level IV	Findings indicate TEs were highly prevalent among TAY in this sample. Overall, the findings from this study confirm anticipated patterns of trauma and associated outcomes for TAY. African American children had higher rates of exposure to community and school violence ($p<0.05$), neglect ($p<0.05$), emotional abuse ($p<0.01$), and being a witness or victim to criminal activity ($p<0.01$).

			completed on youth during their time under care of the Illinois Department of Child and Family Services to identify the frequency and distribution of different types of TE among TAY in relation to sociodemographic variables.		
Tai, Lee, Onukwugha, Zito, Reeves & dosReis (2018)	Examine the impact of the care management entity model on use of acute psychiatric services one year after discharge from the care management	Youths aged 20 years and younger at time of enrollment onto care management entity from December 2009 to December 2013. N=2,814	A retrospective cohort study that used a pre-post design to examine the impact of the care management entity model on clinical outcomes among youths with severe mental or behavioral conditions.	Level IV	A coordinated care model was associated with a lower likelihood of the use of any psychiatric ED visits and hospitalizations within a year after youths were discharged from the program ($p<0.001$)

Vreeland, Ebert, Kuhn, Gracey, Shaffer, Watson, Gruhn, Henry, Dickey, Siciliano, Anderson & Compass (2020)	Identify the utility of the Child and Adolescent Needs and Strengths (CANS) to identify characteristics associated with placement disruption.	Youth aged 5-19 years old in Tennessee state custody July 2012-June 2017 who had assessment within 30 days of first out of home placement, n=8,853	A retrospective secondary analysis of CANS assessment on youth that entered Tennessee state custody in a specified 5-year span to identify the risk for placement disruption based on child problem behaviors and age.	Level IV	Child externalizing problems ($p < .001$), school difficulties ($p < .001$), affect dysregulation ($p < .05$), and child age ($p < .001$) were significant independent predictors of number of lifetime placements. Providing training in the use of effective behavior management techniques for caregivers may be an important target for intervention to decrease placement disruptions for children in foster care.
Wu, Bruns, Tai, Lee, Raghavan & dosReis (2018)	Evaluate the association between receipt of coordinated care services (CCS) and psychotropic polypharmacy along with serious emotional and behavioral disorders.	All youth served in the Medicaid CSS from December 2009-May 2014. N=814	A quasi-experimental design comparing psychotropic polypharmacy between youths with serious emotional and behavioral disorders who were enrolled in CCS and youths with serious	Level IV	Polypharmacy was reduced by 28% from pre-CSS enrollment to post-CCS discharge, $p<0.001$

			emotional and behavioral disorders who received traditional mental health services (non-CCS)		
Zito, Pennap & Safer (2020)	Identify the pharmacoepidemiologic trends and patterns of antidepressant use in publicly insured use	Medicaid data from a single mid-Atlantic state on youth aged 0-19 years old from 8 selected years between 1987-2014 with psychotropic medication comparison data from 2007 and 2014, n=901,043	A longitudinal secondary analysis of Medicaid data from a mid-Atlantic state to examine changes in utilization of antidepressants based on cross-sectional annual prevalence data over a 28-year time span	Level IV	Total prevalence over the time period study, trends for antidepressant prescribing has a 14-fold increase with significant expansion in those on Medicaid. There was a noted shift to older children and predominance change to females. African American prescribing rates increased with the greatest increase seen in foster care youth. Foster care youth are 6 times more likely to receive an antidepressant.
Zito, Zhu & Safer (2021)	Identify the state of current literature regarding the inter-class psychotropic polypharmacy treatment in youth	PubMed literature review January 2000-December 2020 on papers with quantitative analysis on pediatric psychotropic inter-class	A comprehensive literature review from 2010-2020 on studies that identified pediatric psychotropic polypharmacy	Level I	Pediatric psychotropic polypharmacy effects substantially more children and adolescents today than was the case 20+ years ago. As many as 300,000 youth received 3 or more classes concomitantly in 2011–2016. The duration of concomitant use is relatively long, e.g., 69–89% of annual medicated days. Adverse event reports were associated with more complex regimens (3-class compared with 2-class concomitant regimens). Certain populations are at higher risk for polypharmacy including those who are in child welfare system.

		polypharmacy, n=35	to identify methods utilized for oversite		

Table 3: Descriptive Frequencies of WAW

Demographic Characteristics for Foster Care Youth	Total (*n*=2146) Total Prescribed Psychotropic Medication(*n*=1444)	
	M	***SD***
Age	7.81	5.77
Study Population	12.32	4.09
Medication Prescribed Group		
BMI	24.00	7.97
Study Population		
Medication Prescribed Group	23.27	6.74
	N	***%***
Sex		
Male	931	43.4%
Female	944	44%
Missing	271	12.7%
Race/Ethnicity		
White	1047	48.8%
African American/Black	652	30.4%
American Indian	8	0.4%
Asian/Pacific Islander	2	0.0%
Multiracial	45	2.1%
Missing	392	18.3%
County	740	34.5%
Jefferson County		
St. Charles County	138	6.5%
St. Francois County	2	0%
St. Louis City	393	18.3%
St. Louis County	476	22.2%
Washington County	126	5.9%
Missing	271	12.7%
Psychotropic Medications		
1-2	882	41.1%
3-4	409	19.1%
5+	153	7.1%
Total	1444	67.3%

Table 4: Bivariate Correlations

	1	2	3	4
1 Number of Psychotropic Medications	-			
2 Age	.53**	-		
3 Zip Code	.48**	-0.01	-	
4 BMI	.23**	.43**	0.06	-

Note: ** indicates significance at the <.01 level; * indicated significance at the <.05 level

Table 5: Regression Statistics

Regression Statistics	
Multiple R	.404
R Square	**.163**
Adjusted R Square	.129
Standard Error	.738
Sample Size	153

	Df	***SS***	***MS***	***F***	***p***
Regression	6	15.53	2.59	4.751	<.001
Residual	146	79.53	.545		
Total	152	95.06			

	Coefficients	***Standard Error***	***Beta***	***t***	***p***	***Lower 95%***	***Upper 95%***
intercept	-1.24	8.22		-0.15	0.88	-17.48	15.01
Age	**0.04**	**0.02**	**0.21**	**2.45**	**0.02**	**0.01**	**0.07**
Race	-0.04	0.06	-0.04	-0.56	0.56	-0.16	0.09
Sex	**-0.39**	**0.13**	**-0.25**	**-3.09**	**0.00**	**-0.65**	**-0.14**
Zip Code	0.00	0.00	0.03	0.33	0.74	0.00	0.00
Medical Home	-0.13	0.16	-0.07	-0.80	0.42	-0.44	0.18
BMI	**0.02**	**0.01**	**0.20**	**2.18**	**0.03**	**0.00**	**0.05**

Table 6: Independent Samples Test for Post Placement Physical

	Levene's Test for Equality of Variances		**t-test for Equality of Means**							
	F	*P*	*t*	*Df*	*Significance*		*Mean Difference*	*Std. Error Difference*	*95% Confidence Interval of the Difference*	
					One-Sided p	*Two-Sided p*			*Lower*	*Upper*
BMI*	3.40	0.07	1.09	1109.00	0.14	0.28	0.75	0.69	-0.60	2.10
Primary placement count**	178.94	<.001	-38.36	3786.18	<.001	<.001	-1.78	0.05	-1.87	-1.69

Note: Based on the Levene's Test for Equality of Variances * indicates Equal variances assumed and ** indicates Equal variances not assumed

Table 7: Independent Samples Test for Presence of Medical Home

	Levene's Test for Equality of Variances		**t-test for Equality of Means**							
	F	*P*	*t*	*Df*	*Significance*		*Mean Difference*	*Std. Error Difference*	*95% Confidence Interval of the Difference*	
					One-Sided p	*Two-Sided p*			*Lower*	*Upper*
BMI**	6.38	0.01	-4.96	53.16	<.001	<.001	-6.70	1.35	-9.41	-3.99
Primary placement count*	2.73	0.10	-6.16	2645.00	<.001	<.001	-0.37	0.06	-0.48	-0.25

Note: Based on the Levene's Test for Equality of Variances * indicates Equal variances assumed and ** indicates Equal variances not assumed

Table 8: Independent Samples Test for Presence of Psychological Evaluation

	Levene's Test for Equality of Variances		**t-test for Equality of Means**							
					Significance				*95% Confidence Interval of the Difference*	
	F	*P*	*t*	*Df*	*One-Sided p*	*Two-Sided p*	*Mean Difference*	*Std. Error Difference*	*Lower*	*Upper*
Number of Psychiatric Medications Prescribed	2.064	.151	-17.882	1901	<.001	<.001	-.730	.041	-.810	-.650

Figure 1: PRISMA Diagram

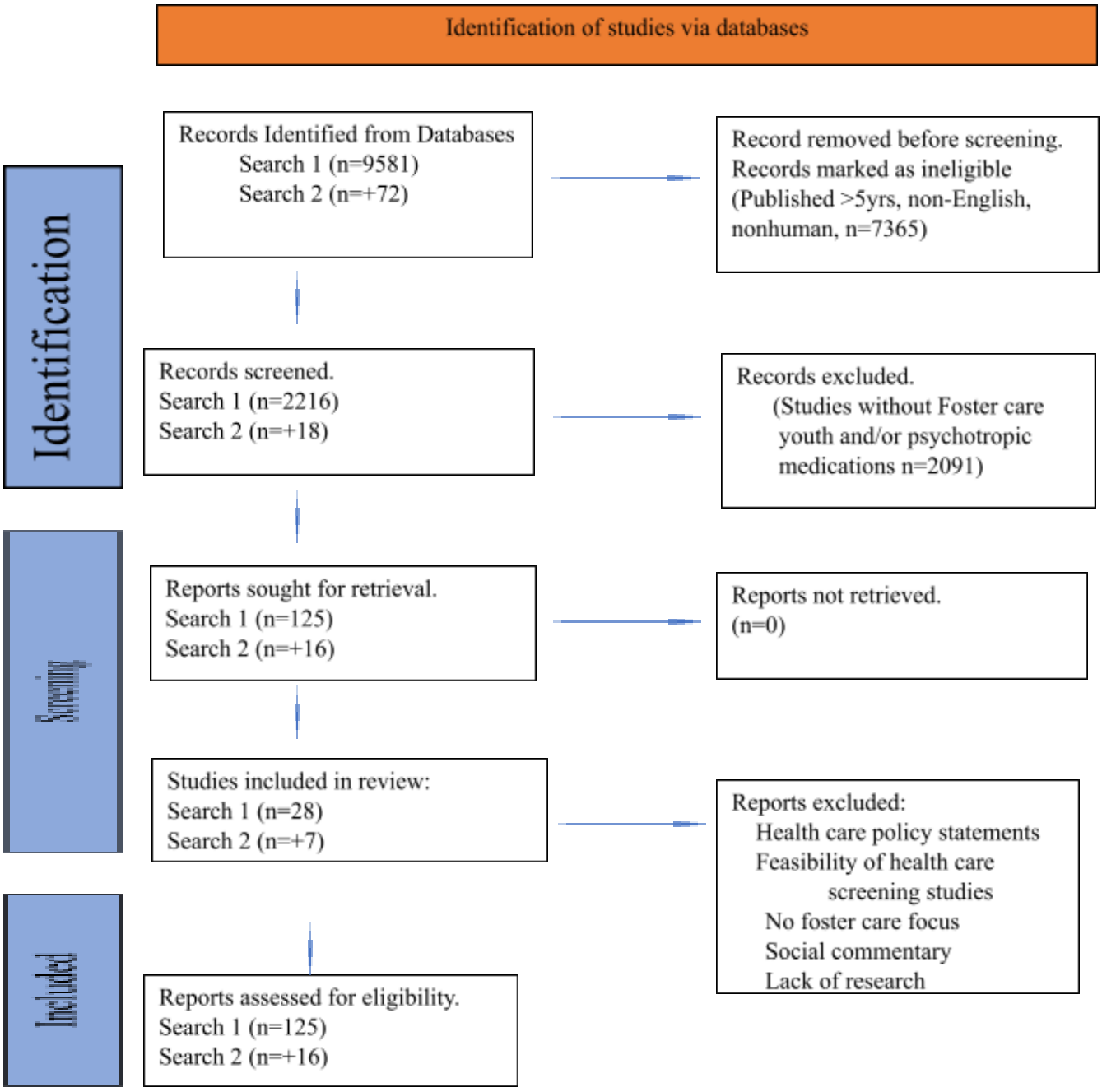
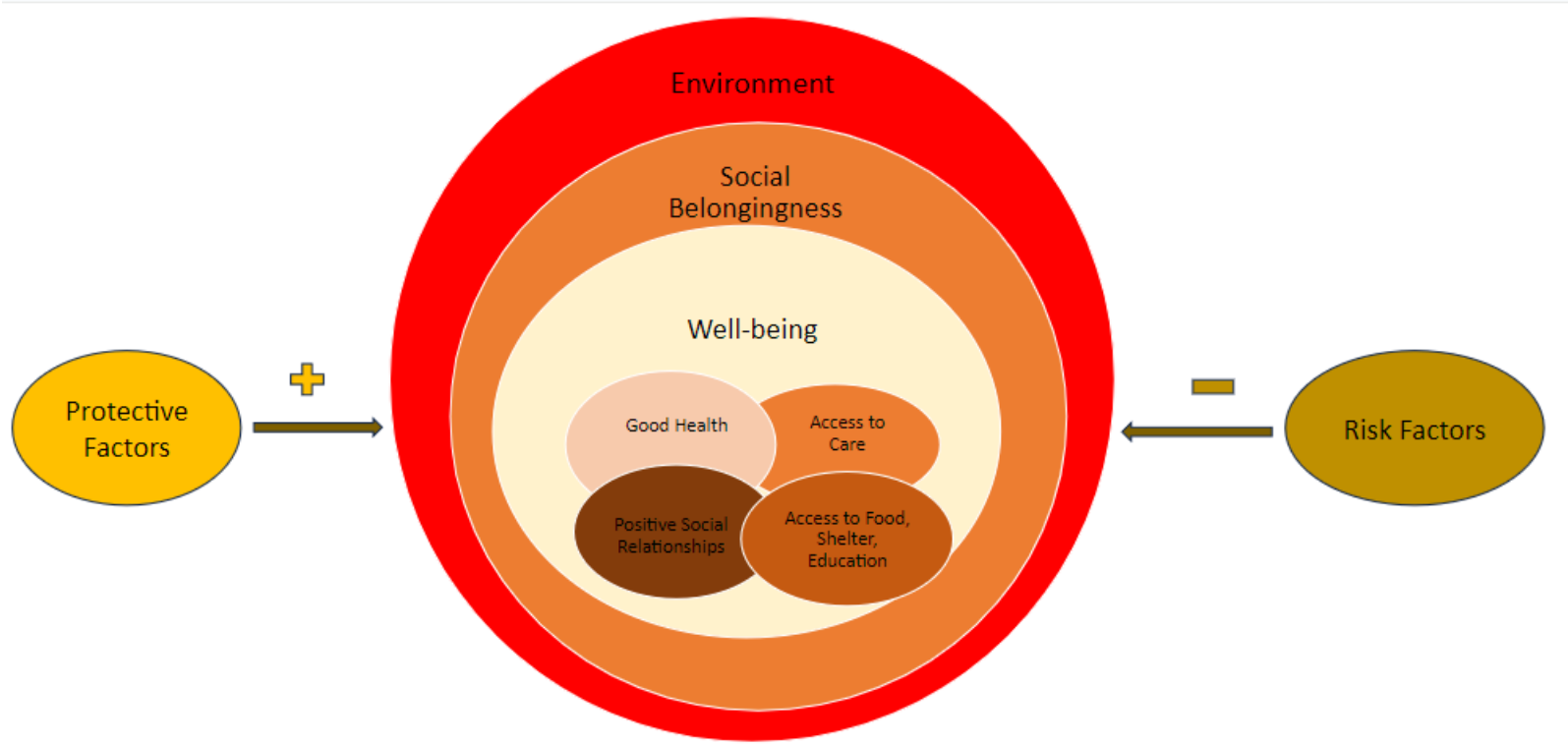
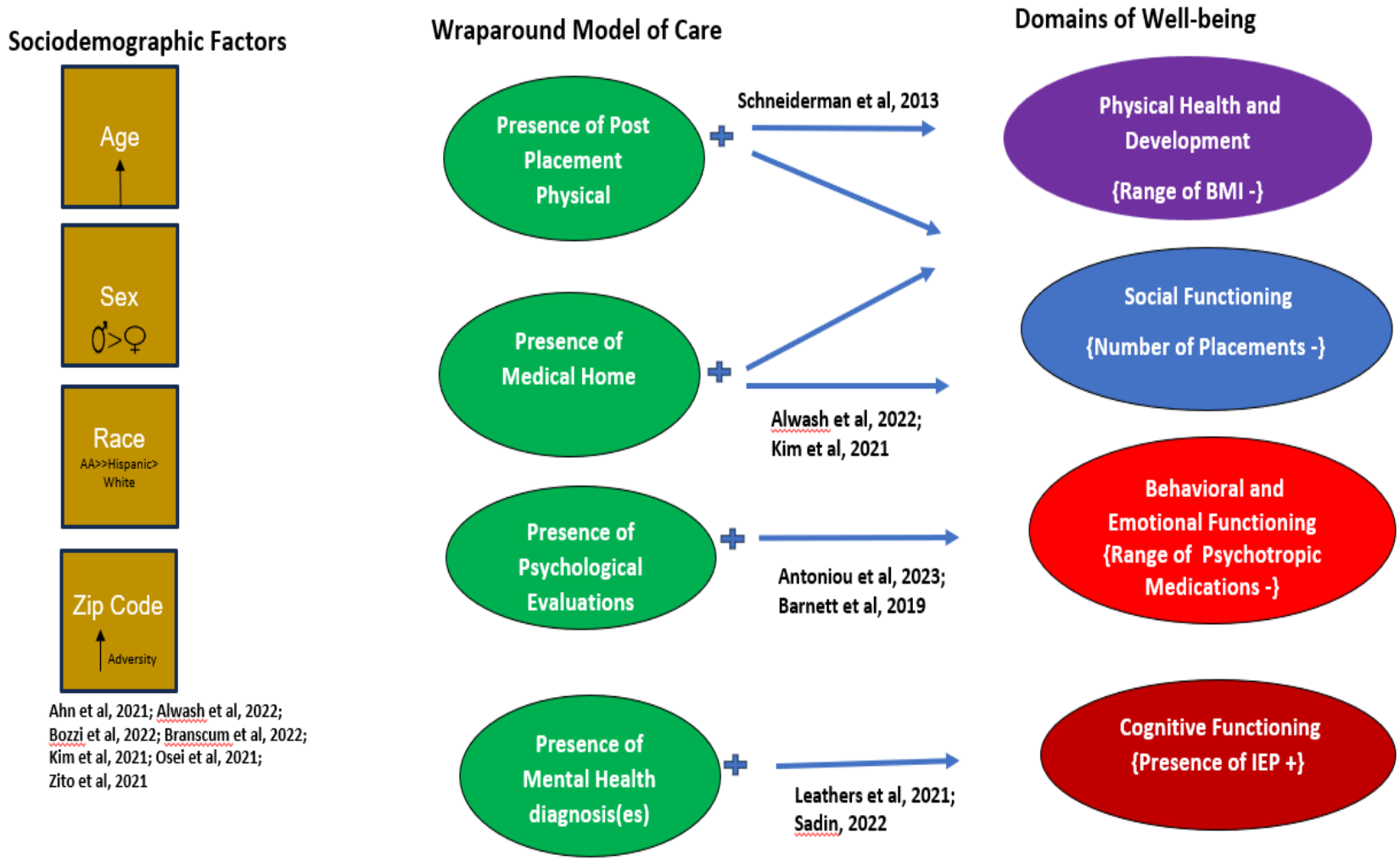


Figure 2: Theoretical Model of Well-being in Foster Care Youth



Bandura, A. (1997). Self-efficacy: The exercise of control. W H Freeman/Times Books/ Henry Holt & Co.
Deci, E. L., & Ryan, R. M. (1985). Intrinsic Motivation and Self-Determination in Human Behavior. New York, NY: Plenum. https://doi.org/10.1007/978-1-4899-2271-7
Lou, C., Anthony, E. K., Stone, S., Vu, C. M., & Austin, M. J. (2008). Assessing Child and Youth Weil-Being: Implications for Child Welfare Practice. Journal of Evidence-Based Social Work, 5(1–2), 91–133. https://doi.org/10.1300/J394v05n01_05

Figure 3: Conceptual Model of Well-Being in Foster Care Youth



*Sociodemographic factors associated with risk: increased age, male gender, African American or Hispanic Race, and zip code with increased adversity

*+/- represent protective and risk factors respectively, certain variables are dependent on value for classification

Appendix A: Forms

Copy of LS 1 Form:

REGION	CIRCUIT	CMCNTY	Agency CODE	FCCM Agency END	CMWRKR	SUPNAME	SERVCNTY	SWRKR	ID Number	DOB	AGE	RACE	NATIVE AMERICAN FLAG	HISPANIC	SEX	RELIGION	…	FPLTYPE	FDVN	Wrks	CASESTAT	JV Number	Res Circuit	Res Region	TRIBAL AFFILIATION

Copy of New Intake Log:

Youth Name	Reason entered care NOTES	DCN	DOB	LS-1	Initial Exam (72hr)	Actual 72hr	Timely/ overdue 72 hour	30-day HCY	Actual 30 day	Timely of Overdue 30 Day	Contact with CM/follow up	Medical Home	Follow Up Care Arrangements

Copy of WAW Psychotropic Meds All Teams:

0	Name of Youth	DCN	DOB	Age	Gender	Height	Weight	Prescribed Medication	Amount Prescribed	Frequency	Category of Med	Start Date	Reason Prescribed	Name of Prescribing Doctor	Dr. Phone number	Type of Doctor Prescribing	Last Psychological Eval	Case Manager	Agency	Supervisor	

Copy of Biopsychosocial Assessment:

Mental/ Medical Health and Trauma Summary

DATE:

Case Manager: **Supervisor**:

Youth Name: **DOB:** **DCN:**

Number of Placement Changes:

Location	Type of Placement	Dates	# of Days in Placement

Number of case manager changes:

Current Case Manager:

LS-1 Date:

Why child is in care:

Case goal:

Number of Psychiatric Hospitalizations (where, when and duration):

Residential Placements:

Psychiatrist: **Contact #:** **Duration:**

Current:

Current Mental Health Diagnosis:

Hx of Mental Health Diagnoses (*when, what were symptoms and who gave them****):***

Count	Diagnosis Type	Date	Symptom	Provider	Notes

*Notes:

Prescription Medications:

Current Prescribed Medications	Amount Prescribed	Start Date	Why prescribed

Are these medications working? How do you know (what changes occurred) ?:

How did we get to these medications (previously not working, etc.):

Psychological Evaluation Hx (and & Dr. Name (need a copy of most recent):

Current Symptoms/ Behaviors:

Hx of High-Risk Behaviors *(elopement, sexually acting out, aggression etc.)***:**

Trauma Hx:

Major life events affecting overall wellbeing:

Medical Diagnosis (When, where, who made it, one count unless noted):

Count	Diagnosis Type	Date	Symptom	Provider	Notes

Developmental information/ Hx and how do we know (meeting milestones on time, developmental disabilities, etc.):

Educational Hx (IQ, IEP, 504, etc.):

Other psychosocial interventions (Counseling, speech/occupational therapy, ABA, charting behaviors etc.):

Treatment and response:

Treatment Hx:

Adults in the child's life before and since being in care:

Child's Strengths:

Prepared by:
Christina Walker, BS
Quality Assurance Wellness Coordinator
Children's Permanency Partnership/ Family Forward

Copy of WAW Outcome Tracking:

Wrap Around Wellness Outcome Tracking					
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year end Averages
Psychotropic Medication					
1-2 Meds					
3-4 Meds					
5+ Meds					
Total Youth on at least 1 Psychotropic Medication					
Medically Fragile					
Prescribing Doctors (psychotropic meds)					
Pediatricians					
Pediatric Psychiatrists					
No Information					
All Psychotropic Medication by Age					
0-5 years					
6-12 years					
13-17 years					
18-21 years					
Deep Dives Started/ Completed					
5+ Medications					
0-5 years					
6-12 years					
13-17 years					
18-21 years					
Male					
Female					
Transgender, Gender Fluid, Questioning					
Metabolic Screening					
Left Care					
Reduction in Medication					
Breakdown of Diagnosis					

ADHD						
PTSD						
Bipolar Disorder						
Major Depressive Disorder						
Autism Spectrum Disorder						
Anxiety						
Mood/ Conduct Disorder (Disruptive Mood Dysregulation, Conduct Disorder, Affective, ODD)						
Sleep Disorder						
Borderline Personality Disorder						
RAD						
Level of Care						
Residential Treatment						
Therapeutic Foster Home						
Career Foster Home						
Behavioral Foster Home						
Traditional Foster Home						
Kinship Home						
Detention						
RUN						
Medical Outcomes						
Total Intakes						
Timely Initial Exams						
Missed Initial Exams						
Late Initial Exams						
CD Transfer-*(CD did not complete timely/#of late exams)*						
Child Exited Care before exam						
Total 30-day exams Due (30 day due during quarter)						
Timely 30-day Exam						
Missed 30-day Exam						
CD Transfer-(CD did not complete timely/#of late exams)						

Child Exited Care before exam						
STOC Outcomes						
Initial Exams						
Transfer-CD did not complete						
CM did not notify placement to schedule						
Pediatrician availability						
Placement could not take youth						
FP forgot about appointment						
Child could not be located						
Other						
Have not received STOC						
30-Day Exams						
Transfer-CD did not complete						
CM did not notify placement to schedule						
Pediatrician availability						
Placement could not take youth						
FP forgot about appointment						
Child could not be located						
Other						
Have not received STOC						
Average LOT to receive STOC						
Meetings						
Community Partners/ Engagement						
Medical Appointment Youth						
Consult Julie						

FST/ Care Planning Youth						
Deep Dive/ CM Consult						
QA Meetings						
Trainings						
Provided						
Attended						
Communication	(Some communication involves multiple subjects and both internal/external communication methods). This is additional to any communication related to initial/30-day exams, deep dives, Medication tracking, etc.)					
Internal						
External						
Medication Management						
Informed Consent/ Policy Clarification						
Mental Health Management						
Medical Health Management						
Service Linkage and Referral						
FACES/Cyber Access						

Appendix B: DUA

Agreement ID:

FDP Data Transfer and Use Agreement ("Agreement")

Provider: Children's Permenancy Partnership	Recipient: University of Missouri - St. Louis
Provider Scientist Name: Email:	Recipient Scientist Name: Kimberly B. Werner Email: wernerk@umsl.edu
Agreement Term Start Date: Date of last signature below End Date: Three (3) Years after the Start Date	Project Title: Sociodemographic and psychosocial determinants of well being in youth in Attachment 2 Type: Limited Data Set

Terms and Conditions

1) Provider shall provide the data set described in Attachment 1 (the "Data") to Recipient for the research purpose set forth in Attachment 1 (the "Project"). Provider shall retain ownership of any rights it may have in the Data, and Recipient does not obtain any rights in the Data other than as set forth herein.

2) If applicable, reimbursement of any costs associated with the preparation, compilation, and transfer of the Data to the Recipient will be addressed in Attachment 1.

3) Recipient shall not use the Data except as authorized under this Agreement. The Data will be used solely to conduct the Project and solely by Recipient Scientist and Recipient's faculty, employees, fellows, students, and agents ("Recipient Personnel") and Collaborator Personnel (as defined in Attachment 3) that have a need to use, or provide a service in respect of, the Data in connection with the Project and whose obligations of use are consistent with the terms of this Agreement (collectively, "Authorized Persons").

4) Except as authorized under this Agreement or otherwise required by law, Recipient agrees to retain control over the Data and shall not disclose, release, sell, rent, lease, loan, or otherwise grant access to the Data to any third party, except Authorized Persons, without the prior written consent of Provider. Recipient agrees to establish appropriate administrative, technical, and physical safeguards to prevent unauthorized use of or access to the Data and comply with any other special requirements relating to safeguarding of the Data as may be set forth in Attachment 2.

5) Recipient agrees to use the Data in compliance with all applicable laws, rules, and regulations, as well as all professional standards applicable to such research.

6) Recipient is encouraged to make publicly available the results of the Project. Before Recipient submits a paper or abstract for publication or otherwise intends to publicly disclose information about the results of the Project, the Provider will have thirty (30) days from receipt to review proposed manuscripts and ten (10) days from receipt to review proposed abstracts to ensure that the Data is appropriately protected. Provider may request in writing that the proposed publication or other disclosure be delayed for up to thirty (30) additional days as necessary to protect proprietary information.

Agreement ID:

7) Recipient agrees to recognize the contribution of the Provider as the source of the Data in all written, visual, or oral public disclosures concerning Recipient's research using the Data, as appropriate in accordance with scholarly standards and any specific format that has been indicated in Attachment 1.

8) Unless terminated earlier in accordance with this section or extended via a modification in accordance with Section 13, this Agreement shall expire as of the End Date set forth above. Either party may terminate this Agreement with thirty (30) days written notice to the other party's Authorized Official as set forth below. Upon expiration or early termination of this Agreement, Recipient shall follow the disposition instructions provided in Attachment 1, provided, however, that Recipient may retain one (1) copy of the Data to the extent necessary to comply with the records retention requirements under any law, and for the purposes of research integrity and verification.

9) Except as provided below or prohibited by law, any Data delivered pursuant to this Agreement is understood to be provided "AS IS." PROVIDER MAKES NO REPRESENTATIONS AND EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR THAT THE USE OF THE DATA WILL NOT INFRINGE ANY PATENT, COPYRIGHT, TRADEMARK, OR OTHER PROPRIETARY RIGHTS. Notwithstanding, Provider, to the best of its knowledge and belief, has the right and authority to provide the Data to Recipient for use in the Project.

10) Except to the extent prohibited by law, the Recipient assumes all liability for damages which may arise from its use, storage, disclosure, or disposal of the Data. The Provider will not be liable to the Recipient for any loss, claim, or demand made by the Recipient, or made against the Recipient by any other party, due to or arising from the use of the Data by the Recipient, except to the extent permitted by law when caused by the gross negligence or willful misconduct of the Provider. No indemnification for any loss, claim, damage, or liability is intended or provided by either party under this Agreement.

11) Neither party shall use the other party's name, trademarks, or other logos in any publicity, advertising, or news release without the prior written approval of an authorized representative of that party. The parties agree that each party may disclose factual information regarding the existence and purpose of the relationship that is the subject of this Agreement for other purposes without written permission from the other party provided that any such statement shall accurately and appropriately describe the relationship of the parties and shall not in any manner imply endorsement by the other party whose name is being used.

12) Unless otherwise specified, this Agreement and the below listed Attachments embody the entire understanding between Provider and Recipient regarding the transfer of the Data to Recipient for the Project:

   I. Attachment 1: Project Specific Information
   II. Attachment 2: Data-specific Terms and Conditions
   III. Attachment 3: Identification of Permitted Collaborators (if any)

13) No modification or waiver of this Agreement shall be valid unless in writing and executed by duly-authorized representatives of both parties.

Agreement ID:

14) The undersigned Authorized Officials of Provider and Recipient expressly represent and affirm that the contents of any statements made herein are truthful and accurate and that they are duly authorized to sign this Agreement on behalf of their institution.

By an Authorized Official of Provider:	By an Authorized Official of Recipient:
_____ Date	_____ Date
Name:	Name: Kimberly Werner, PhD
Title:	Title: [illegible]
Contact Information for Formal Notices:	Contact Information for Formal Notices:
Name:	Name: Chris Spilling, PhD Vice Chancelor of Research
Address:	Address: 1 University Blvd St. Louis, Missouri 63121
Email:	Email: wernerk@umsl.edu
Phone:	Phone: 314-516-8421

Agreement ID:

Attachment 1
Data Transfer and Use Agreement
Project Specific Information

1. Description of Data:

The specific data that is requested and will be provided are variables to help identify overall child well being and associated biopsychosocial factors that are associated with well-being outcomes for children in the Foster Care system in Missouri. Data provided by Children's Permanency Placement (CPP) are secondary data that are already collected in the course of normal care. Data will include the following human subject data: medical record number for merging datasets, demographic characteristics, the number of foster home/residential placements per child, length of time in placement, post placement physical examination completed, use of a medical home, completion of psychological evaluation, number of psychotropic medications, mental health diagnosis, level of care of the child, body mass index and zip code. The data to be provided was collected under normal care and reporting through the Missouri Children's Division and CPP under the Wrap Around Wellness program implemented under the leadership Dr Julie Bertram and Alisha Acosta. The data collected from 1/1/2017-12/31/2022 will be used for this analysis. There are approximately 600 children annually in Missouri Foster Care that are followed by CPP and are included in the data sets requested for this research.

2. Description of Project:

The purpose of this study is to identify the variables that promote well-being in youth in foster care in Missouri by evaluating the outcomes of the Wrap Around Wellness Program created and directed by Dr. Julie Bertram and Alisha Acosta. The data recipient(s) of this agreement will perform secondary analysis of a limited dataset collected on youth in foster care by Children's Permanency Partnership (CPP). Data collected 2017-2022 is requested for this analysis. Data will be received from CPP in a limited dataset format and under terms of this data use agreement as well as a business associate agreement to protect client data. The current data is available in excel data sets. All data transfer and storage is outlined below. Data sets are requested without client name, but to include medical record number (DCN) to allow individual level data tracking through data sets. Once data bases are merged, data will be de-identified for the analysis and identifying information will be destroyed per disposition agreement outlined below.

The data requested (described above) are variables that align with the well-being indicators defined by the KIDS COUNT Data sponsored by the U.S. Department of Health and Human Services Administration for Children and Families. The KIDS COUNT data set will serve as the national standard for the Wrap Around Wellness outcomes. Additional federally available data (e.g. US Census data) will be linked to this dataset to include consideration of the geographic and larger community factors as potential predictors of well-being in this population. Regression analyses of this data will be completed to identify individual level and community level variables that promote well-being in youth that received services through CPP and the the Wrap Around Wellness Program.

3. Provider Support and Data Transmission:

Provider shall transmit the Data to Recipient: (select one) ☑ electronically or ☐ by mail to:

Name:	Kimberly Werner, PhD
Address:	1 University Blvd
Email:	wernerk@umsl.edu
Phone:	314-516-8421

Agreement ID:

Upon execution of this Agreement, Provider shall send any specific instructions necessary to complete the transfer of the Data to the contact person listed above, if not already included below in this section of Attachment 1.

Data will be shared from the Provider to the Recipient via a secure, password protected, and UMSL approved cloud based drive. No data will be returned or shared from the Recipient to the Provider - this is a one way data use agreement. Data will be provided in the format of excel worksheets (i.e., .csv, .xls, .xlsx files) and will include detailed pertaining to the operationalization of variables and data dictionary, as available. If there are revisions or clarification to understand the data structure required, the Recipient will request a meeting with the Provider and, if required, additional/revised data will be shared via the initially describe method.

4. Reimbursement of Costs:

☑ None

☐ As governed by a separate written agreement between the parties
Reimbursement Agreement Reference # (if required):
_____

☐ As set forth herein:

5. Disposition Requirements upon the termination or expiration of the Agreement:

It is the understanding of the Provider and Recipient that all identifiable data (i.e DCN) will be removed from the data once the datasets are merged and prior to any linkage with other open data sets. The Recipient is permitted to link the Data with other open access data sets, only after the data from the Provider has been de-identified.

Prior to the expiration of this Agreement, the data set will be deleted or destroyed. The terms of this Agreement can be changed only by a written modification to the agreement by the agency signatories (or their designated representatives) to this Agreement or by the parties adopting a new agreement in place of this Agreement.

This Agreement may be terminated by either party at any time for any reason upon 30 days written notice. Upon such notice, the Provider will notify the Requester to destroy or securely return such data at Requestor's expense using the same procedures detailed in the

Agreement ID:

Attachment 3
Data Transfer and Use Agreement
Identification of Permitted Collaborators (if any)

For all purposes of this Agreement, the definition of "Collaborator Personnel" checked below will pertain:

☐ "Collaborator Personnel" means: None. No collaborators are permitted on the Project.

-OR-

☑ "Collaborator Personnel" means as set forth below and agreed upon between the Parties:

"Collaborator Personnel" means: faculty, employees, fellows, or students of an academic institution, which institution (i) has agreed to collaborate in the Project, (ii) has faculty, employees, fellows, or students of an academic institution who have a need to use or provide a service in respect of the Data in connection with its collaboration in the Project, and (iii) has been made aware of the terms of this Agreement and agreed to comply, and to cause its personnel to comply, with such terms.

Collaborator Personnel will include:

Ann Stratton, APRN, CNP
University of Missouri-St. Louis

Julie Bertam, PhD
University of Missouri-St. Louis