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Mental Health and Substance Use Disorders among Foster Youth Transitioning to Adulthood: Past Research and Future Directions

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Abstract

At a time when there is increasing attention being given to systematically integrating the well-being of children with the goals of safety and permanence in child welfare, little is known about the psychosocial functioning of foster youth transitioning to adulthood from substitute care. This article systematically reviews 17 peer-reviewed articles and/or research reports to identify lifetime and past year prevalence rates of mental health disorders and service utilization. At ages 17 or 18, foster youth are 2 to 4 times more likely to suffer from lifetime and/or past year mental health disorders compared to transition aged youth in the general population. Findings show that mental health service use declines at ages when the prevalence rate of mental health disorders is peaking. The findings of this review suggest the need to focus future efforts in three main areas: 1) Setting a common research agenda for the study of mental health and service use; 2) Routine screening and empirically supported treatments; and 3) Integration and planning between child and adult mental health service systems.

Search terms

Aging out foster youth; transition aged foster youth; mental health disorders; alcohol and substance use disorders; prevalence rates of lifetime and past year psychiatric disorders; mental health services

Children and youth placed into substitute care experience numerous challenges in psychosocial functioning. They score higher on standardized measures of emotional and behavioral problems than same aged peers in the general population (Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Halfon, Mendonca, & Berkowitz, 1995; Horowitz, Simms, & Farrington, 1994; Landsverk & Garland, 1999; Leslie et al., 2000; Trupin, Tarico, Low, Jemelka, & McClellan, 1993); they have mental health conditions at twice the rate as

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same aged children receiving aid from Supplemental Security Income (SSI) (dosReis, Zito, Safer, & Soeken, 2001); and they represent a large percentage of users of mental health services even though they make up a small proportion of the overall population that is eligible (Halfon, Berkowitz, & Klee, 1992; Harman, Childs, & Kelleher, 2000; Takayama, Bergman, & Connell, 1994).

Less is known about the psychosocial functioning of foster youth transitioning to adulthood. Information about foster youth and the prevalence of health, mental health, and developmental conditions in adulthood has only accumulated in the past several years (Courtney, Terao, & Bost, 2004; Courtney & Dworsky, 2006; Hill, Lightfoot, & Kimball, 2010; Kushel, Yen, Gee, & Courtney, 2007; Narendorf & McMillen, 2010; Needell, Cuccaro-Alamin, Brookhart, Jackman, & Shlonsky, 2002; Raghavan & McMillen, 2008). Several areas, which are arguably central to well-being, such as physical health and substance use, remain poorly understood (Courtney & Heuring, 2005). Although several studies shed light on mental health and service use (Barth, 1990; Courtney, Piliavin, Grogan-Kaylor, & Nesmith, 2001), few have used a diagnostic assessment that is capable of making precise clinical diagnoses which are necessary to determine need. Limited information concerning common dimensions of mental health, such as the age of onset, severity, and co-occurrence with other conditions, further obscures understanding of the ways in which mental health contributes to risks in adulthood.

A lack of current and comprehensive information about the psychosocial functioning of foster youth transitioning to adulthood presents a significant gap in the existing knowledge base with relevance to prevention and intervention. The transition to adulthood is increasingly being considered as a unique “window of opportunity” for altering developmental trajectories (Masten, 2006; Masten, Obradovi , & Burt, 2006; Schulenberg, Sameroff, & Cicchetti, 2004). Advances in developmental neuroscience and developmental psychology are building a persuasive case for new ways of thinking about catalysts for change in adolescence and adulthood (Tough, 2012). Findings suggest that parts of the brain develop well into the twenties, and lead to improved competence in executive functioning, including attention, memory, self-regulation, and future planning (Blakemore & Choudhury, 2006; Dahl, 2004; Steinberg et al., 2009). It may then follow that well-specified programs in adolescence and early adulthood hold promise for optimizing health and development when they are integrated within the larger goals of child welfare and other systems of care. Active responses to these developments require a new paradigm for conceptualizing the meaning of safety, permanence and well-being for adolescents and transition aged youth. In the interest of providing guidance for future research, intervention development, and programming, we review the research on foster youth transitioning to adulthood and mental health in the context of evolving developments in independent living policy in the United States and the growing importance of developmental transitions in directing the life course.

Background

The many challenges faced by foster youth making the transition from of out-of-home care to independent adulthood are well documented (Barth, 1990; Cook, 1991; Courtney et al., 2001; Festinger, 1983; Goerge et al., 2002; Needell et al., 2002; Reilly, 2003). To better support the transition to adulthood, Congress has amended the Social Security Act three times in the past three decades. The Fostering Connections to Success and Increasing Adoptions Act of 2008 (P.L. 110-351) represents a fundamental shift away from the goal of preparing foster youth for independence towards the promotion of protective scaffolding that is necessary for any young adult to achieve success (Courtney & Society for Research in Child Development, 2009). Persistent challenges lie in the low number of states that have taken up the option to extend the age through which youth can remain in care and a lack of

evidence supporting existing approaches aimed at improving outcomes (Courtney, Zinn, Koralek, & Bess, 2011; Courtney, Zinn, Johnson, & Malm, 2011; Montgomery, Donkoh, & Underhill, 2006; U.S. Department of Health and Human Services, 2008a; U.S. Department of Health and Human Services, 2008b).

One factor contributing to poor prospects during the transition to adulthood may be related to a high prevalence of mental health conditions (Courtney & Hughes, 2006). In one investigation of homelessness following discharge from substitute care, foster youth living in continuously unstable living situations were three to four times more likely to suffer from emotional and behavioral disorders than those living in stable situations (Fowler, Toro, & Miles, 2009). In another prospective study, the time to arrest was shorter for those foster youth with an alcohol or drug abuse diagnosis than for those without a diagnosis (Cusick, Havlicek, & Courtney, 2012). A large body of research in community-based samples finds the risk of experiencing negative outcomes during the transition to adulthood is greater for adolescents with mental health disorders or heavy substance abuse or dependence (Griffin, Ramchand, Edelen, McCaffrey, & Morral, 2011; Jayakody, Danziger, & Kessler, 1998; Kandel, Davies, Karus, & Yamaguchi, 1986; Vander Stoep et al., 2000). Understanding the match between the needs of young adults with mental health conditions and the social roles and contexts that are afforded to them in the transition to adulthood is likely critical to understanding the power of developmental transitions in improving adaptation and well-being (Schulenberg et al., 2004).

Studies find that many foster youth enter adulthood behind their peers in education and other markers of development (Courtney et al., 2001; Keller, Cusick, & Courtney, 2007). These delays can powerfully undermine developmental readiness for adulthood and set the stage for the occurrence of other negative events when the safety net is time limited. For youth with a mental health condition, the stressors that come with the onset of new social roles and contexts during the transition to adulthood may exacerbate the ability to cope and become a barrier to participating fully in the developmental tasks of adulthood without supports.

Child welfare systems have long been considered to be important gateways to supportive services for individuals exhibiting emotional and behavioral problems (Landsverk & Garland, 1999; Leslie, Hurlburt, Landsverk, Barth, & Slymen, 2004). When asked, transition aged foster youth and service providers report feeling uninformed about mental health and mental health service options (California Youth Connection, 2000; Havlicek, McMillen, Fedoravicius, McNelly, & Robinson, 2012; Narendorf, Fedoravicius, McMillen, McNelly, & Robinson, 2011). At a developmental time when the prevalence rates of mental health and substance use disorders in the general population are peaking (Chen & Kandel, 1995; Johnston, O'Malley, Bachman, & Schulenberg, 2002), studies find steep drop off in mental health service use (McMillen & Raghavan, 2008; Needell et al., 2002).

Child welfare programming for adolescents with mental health disorders may also mean that placement instability and/or placement in atypical contexts is common. Although research identifies a risk of iatrogenic effects in interventions that congregate at-risk youth together (Dishion & Andrews, 1995), one study finds as many as 42 percent of foster youth entered adulthood from a congregate care setting (McMillen et al., 2004). Foster youth entering adulthood from a restrictive placement are vulnerable to a range of negative outcomes including criminal justice system involvement (Cusick, Havlicek, & Courtney, 2012) and unstable employment (Hooks & Courtney, 2011) - two events that play a role in establishing independence. Delineating the ways in which vulnerability is shaped by pre-existing conditions prior to placement into congregate care and/or characteristics that are specific to the congregate care is central to any response aimed at promoting well-being (Dmitrieva, Monahan, Cauffman, & Steinberg, 2012).

Perhaps the largest proximal influence on adaptive functioning in adulthood for foster youth with mental health conditions has to do with insufficient support from family members, extended family, and other adults during the transition to adulthood. Foster youth may have few adults to provide information, emotional support and coping, material assistance, or supervision. Should youth become disconnected during adulthood, they may be at greater risk for the occurrence of other adverse events, such as re-victimization and homelessness.

To develop understanding in an area where limited information currently exists, this article summarizes 17 articles and/or research reports reporting prevalence rates of lifetime and past year mental health disorders and mental health service use among foster youth who reach the age of majority in substitute care. Drawing from epidemiological investigations of mental health disorders and service utilization in the general population, three questions serve as a guide. First, what is the lifetime and past year prevalence rates of mental health and substance use disorders at ages 17 or 18? Second, what is the lifetime and past year prevalence rates of mental health and substance use disorders from ages 19 to ages 25 or 26? Third, what are the prevalence rates of mental health service use at the onset and during the transition to adulthood? In the next section, we review the methods by which this systematic review was conducted. A description of the studies and research reports is provided for the reader to clarify similarities and differences across studies.

METHODS

Study Selection

A multi-stage procedure was used to identify articles for inclusion. The first step in the literature review was to search academic, electronic databases of articles published between 1990 and 2012. The key words included: foster youth, aging out, older foster youth, youth leaving care, former foster youth, emancipated youth, and mental health, mental health problems, mental health disorders, DSM, psychiatric disorders, substance abuse disorder, mental health services, substance abuse treatment. These key words were applied in the following databases: CINHL, MEDLINE, ERIC, PSYCHINFO, Social Work Abstracts, and SOCINDEX with full text. The 65 abstracts that were found in these databases were reviewed by the authors.

From these abstracts, articles reporting on DSM-IV diagnoses and mental health service use were located and reviewed. Studies were included if they met the following criteria: 1) The sample turned 17 or 18 in substitute care; 2) The study collected information on lifetime and/or past year DSM-IV disorders using a standardized diagnostic assessment; 3) The study reported on mental health service use (i.e. ever and/or in past year); 4) The study was based on a sample in the U.S.; 5) The article or research report did not duplicate findings reported in another study.

Based on these inclusion criteria, only six articles were selected for review. To identify additional studies that met our criteria we conducted a search on Google Scholar using the same search terms. This search identified four reports and one article. Next, we reviewed reference lists of the eleven sources for additional reports or articles, and identified six additional reports or articles.

In total, seventeen articles or research reports were found to report the lifetime or past year prevalence of mental health disorders and/or rate of mental health service use. Of these articles, six are based on the Midwest study (Courtney et al., 2004; Courtney et al., 2005; Courtney et al., 2007; Courtney et al., 2010; Courtney et al., 2011; Keller, Salazar, & Courtney, 2010); four articles are based on the Voyages study (McMillen et al., 2004; McMillen et al., 2005; McMillen & Raghavan, 2009; Vaughn et al., 2007) and one article is

based on the Casey National Foster Care Alumni Study (Pecora, Jensen, Romanelli, Jackson, & Ortiz, 2009). When we uncovered multiple reports, we included the source that provided the most comprehensive description of mental health disorders. To illustrate, there were three sources reporting on rates of mental health disorder from the baseline data of the Midwest study (Courtney et al., 2004; Keller et al., 2010; Garcia & Courtney, 2011). A decision was made to include the peer-reviewed article by Keller et al. (2008) because this study used call-back information from the baseline sample of the Midwest study to generate new diagnostic information for depression and substance abuse.

Table 1 provides a summary of all seventeen articles and research reports along with the sample exclusion criteria and study limitations. Below we describe the studies and the measures of mental health and service use in greater detail.

Study Description

The Midwest Study of the Adult Functioning of Former Foster Youth (hereafter referred to as the Midwest study) is a longitudinal study that followed 732 foster youth making the transition to adulthood in Illinois, Iowa, and Wisconsin from ages 17 or 18 to age 26, with five waves of data collection (Courtney et al., 2004). The study participants entered foster care before their 16th birthday and the primary reason for their placement was not delinquency. At baseline, when participants were 17 or 18 years old, interviewers administered a computerized version of the lifetime Composite International Diagnostic Interview 2.1 or CIDI (World Health Organization, 1993). Only the modules for depression, dysthymia, PTSD, GAD, social phobia, alcohol abuse and dependence and other drug abuse or dependence were administered. Questions about mental health and substance treatment were drawn from the Add Health study (Udry, 2003), which generated comparisons with youth in the general population.

In the Midwest study, the full CIDI was administered at waves two and three. By the fourth wave, when the participants were 23 or 24 years of age, rates of lifetime mental health disorders were lower than those reported at wave one, leading the investigators to believe that the participants had learned to take the survey without having to answer questions from the CIDI (Courtney et al., 2010). By the fifth wave, only parts of the CIDI were administered to assess for past year rates of mental health disorders (Courtney et al., 2011).

As part of the Mental Health Service Use of Youth Leaving Foster Care (i.e. Voyages) study, McMillen and colleagues followed a sample of 406 foster youth who turned 17 and were under the supervision of child welfare officials in counties surrounding St. Louis, Missouri (McMillen et al., 2004) from December 2001 to June 2003. At baseline and the two-year follow-up, in-person interviews were conducted with participants at their place of residence. In between in-person interviews, quarterly telephone interviews were conducted with between 87 (wave 2) and 64 (wave 8) percent of study participants.

The researchers used the Diagnostic Interview Schedule (DIS) for DSM-IV disorders. (Reich, Welner, & Herjanic, 1997). The DIS, a precursor to the WHO's CIDI, was developed by the National Institute of Mental Health (NIMH) to standardize the measurement of mental illness for the Epidemiological Catchment Area study. The DIS has been used in several community-based epidemiological investigations, including Fast Track (Foster & Jones, 2005) and the Great Smokey Mountains study (Costello et al., 1996), and has moderate test-retest reliability and validity for lifetime and current diagnoses (Helzer, Spitznagel, & McEvoy, 1987). Post-traumatic Stress Disorder (PTSD), major depression, mania, attention deficit disorder/attention deficit and hyperactivity disorder (ADD/ADHD) oppositional defiant disorder (ODD), and conduct disorder were assessed at baseline. Alcohol and substance use were assessed using questions from the Diagnostic Interview

Schedule for Children (DISC-IV) along with modified portions of the DIS and the Comprehensive Addiction and Severity Index for Adolescents (CASI-A), a semi-structured clinical assessment that is designed to serve as a primary intake rather than a diagnostic tool (Meyers, 1991; Meyers, Thomas, McLellan, Jaeger, & Pettinati, 1995).

Service use in the Voyages study was assessed using the Service Assessment for Children and Adolescents (Stiffman et al., 2000). The SACA has been used in several investigations to assess the utilization of mental health and substance abuse services, including the Youth Mental Health Care in Public Service Systems study (Garland et al., 2001) and the National Survey of Child and Adolescent Well-Being study (Dowd, Kinsey, Wheelless, & Suresh, 2002).

The Casey National Foster Care Alumni Study (hereafter referred to as Casey National study) examined outcomes of 1,087 Casey Family Program alumni between the ages of 20–51 years who were in foster care as adolescents for at least one year between 1966 and 1998 (Pecora et al., 2009). These foster youth received foster care services from Casey Family Programs located in 23 sites across 13 states for a minimum of 12 months and were discharged at least one year before the interview. Sixty-eight percent of the sample reached the age of majority in substitute care. The remaining youth were placed in other permanent living arrangements, such as adoption or guardianship. Therefore, the findings should be interpreted carefully. The Casey National study relied on version 3.0 of the CIDI to assess for the presence of a mental health disorder. The modules administered include panic disorder, generalized anxiety disorder, social phobia, posttraumatic stress disorder (PTSD), major depression, and substance use disorders, including alcohol and other drug abuse, with or without dependence.

Several other studies have used state administrative records or caseworker reports to measure the mental health needs of aging out foster youth. Shin (2005) examined the need for and use of mental health services among 113 foster youth between the ages of 16 and 17 in one state. The sample excludes those youth who were placed into residential treatment. DSM-IV diagnoses and mental health service use were assessed using Medicaid claims data. The mental health disorders assessed by the International Classification of Diseases-Ninth Edition (ICD-9) include: conduct disorder, depressive disorder, adjustment disorder, anxiety disorder, ADHD, bipolar disorder, and schizophrenia. The need for mental health services was assessed using the Mental Health Inventory (MHI; Davies, Ware, et al., 1981).

By far the largest investigation of foster youth is that by Needell, Cucarro-Alamin, Brookhart, Jackman, & Schlonsky (2002). In this study of service use, the child welfare administrative records of 11,060 youth in California who exited substitute care between 1992 and 1997 were linked with records from the Department of Mental Health to examine mental health need and receipt of services. Data were linked for 53 percent of the sample (n=6002). Of these, 5,695 youth received mental health services prior to emancipation.

Before 2004, there are four studies that provide information about mental health or substance abuse services (Barth, 1990; Courtney et al., 2001; Festinger, 1983; Jones & Moses, 1984) and none of these studies assess for the presence of a mental health disorder using a clinical face-to-face assessment and/or standardized, diagnostic instrument. After 2004, Raghavan & McMillen (2008) were the first to report in-depth information on the use of medications even though the use of psychotropic medication for children and youth served in public systems of care are known to be high (U.S. GAO, 2011; Raghavan & McMillen, 2008). More recently, Shook and colleagues used administrative data to retrospectively follow service use across multiple systems including mental health, substance abuse, juvenile justice and employment training for 1,361 youth who aged out of

care in one county (Shook et al., 2011). This was the first study to document cross system use among this population.

Below, the findings from this review are discussed. These findings are organized to distinguish estimated lifetime and past year prevalence rates of mental health disorders at ages 17 or 18 from those at ages 19 and older. When possible we provide comparisons of DSM-IV diagnoses to same aged youth or young adults in the general population. We only include general population estimates from epidemiological studies from the United States.

RESULTS

Table 2 presents estimated lifetime and 12-month prevalence rates for mental health disorders at age 17 or 18. Information about the lifetime and past year rates of mental health disorders in the general population studies is provided in the far right hand corner of Table 2 for each lifetime and past year category. Lifetime prevalence rates of mental disorders in the U.S. for 17–18 year olds are from the National Comorbidity Survey Replication – Adolescent Supplement (NCS-A). The 12-month prevalence rates of mental health disorders in the U.S. for 17 to 18 year olds were downloaded from a recent article by Kessler, Avenevoli, Costello, et al. (2012).

Lifetime Prevalence

There are three studies that report a lifetime rate of any mental health disorder at age 17 or 18. The rate of any lifetime diagnosis ranges from a low of 61 percent (McMillen et al., 2005) to a high of 66 percent (Shin, 2005). No information about the severity of impairment is reported. Using the National Comorbidity Survey Replication (NCS-R) data, the lifetime rate of any mental health disorder among youth in the general population who are 17 or 18 is 57 percent (Merikangas et al., 2010). Among those identified as having a mental health disorder, 22 percent report severe distress or impairment.

12-Month Prevalence

Next we examine the estimated 12-month prevalence rates of any mental health disorder. At age 17, McMillen et al. (2005) find that 37 percent of the sample have a past year mental health disorder. Among same aged youth in the National Comorbidity Study-Adolescent Supplement, the past year rate of any mental health disorders is 49 percent (Kessler et al., 2012).

Comorbidity

Comorbidity is defined as the co-occurrence of two or more mental health disorders. Only one study reports a lifetime estimate of comorbidity among foster youth transitioning to adulthood. At age 17, McMillen et al. (2005) describe the rate of homotypic comorbidity. They find 32 percent of the sample qualified as having more than one lifetime mental health disorder. Among 17–18 year olds in the general population, the lifetime rate of heterotypic comorbidity or having a mental health and substance use diagnosis is 26 percent (Merikangas et al., 2010).

Prevalence of PTSD

There are three studies that assess for the lifetime rate of PTSD. At age 17 or 18, the lifetime rate of PTSD ranges from a low of 14 percent (McMillen et al., 2005) to a high of 15 percent (T. E. Keller, Salazar, & Courtney, 2010). This is over twice the rate observed among a national sample of 17 or 18 year olds in the general population (Merikangas et al., 2010). It is also substantially higher than the 6 percent lifetime prevalence rate reported by (Kessler et al., 2005; Kessler et al., 2005; Kessler, Chiu, Demler, & Walters, 2005) based on a study of

18 to 29 year olds in the general population, and the 6 percent lifetime prevalence among 13–17 year olds in the general population (Kessler et al., 2011).

Past year prevalence rates of PTSD are more difficult to compare in the studies of foster youth transitioning to adulthood. Only one study reports a past year prevalence rate of PTSD at age 17 or 18. The past year rate of PTSD in the Voyages study is estimated to be 8 percent (McMillen et al., 2005). A past year prevalence rate of 8 percent is higher than that reported in the National Comorbidity Study-Adolescent Supplement (5 percent; Kessler et al., 2012).

Prevalence of Conduct Disorder

At age 17, the lifetime rate of conduct disorder ranges from a low of 40 percent (Shin, 2005) to a high of 47 percent (McMillen et al., 2005). The estimated lifetime prevalence of conduct disorder among individuals aged 17–18 in the U.S. is 10 percent (Merikangas et al., 2010).

Only one study of foster youth making the transition to adulthood reports a past year prevalence rate of conduct disorder among foster youth. McMillen et al. (2005) find that 17 percent of 17-year-olds in the VOYAGES study have a past year diagnosis of conduct disorder. Comparable rates of past year diagnoses in the general population is 7 percent (Kessler et al., 2012).

Prevalence of Substance Use Disorders

Two studies describe the lifetime rate of alcohol and other drug disorders at age 17 or 18 using a standardized diagnostic measure for assessing psychiatric disorders (Keller et al., 2010; Vaughn et al., 2007). Using the Midwest study data at baseline, (T. E. Keller et al., 2010) find a lifetime prevalence rate for alcohol abuse or dependence of 14 percent. The lifetime rate of alcohol abuse or dependence among foster youth is similar to the rate observed in one study of 17 or 18 year olds in the general population (14 percent; Merikangas et al., 2010).

For drug abuse or dependence, the lifetime rate at age 17 or 18 in the Midwest study sample is 7 percent (Keller et al., 2010). The lifetime rate of other drug abuse or dependence among 17 or 18 year olds in the general population is over three times higher (22 percent; Merikangas et al., 2010). The rate of any substance use disorder ranges from a low of 20 percent (Keller et al., 2010) to a high of 37 percent (Vaughn et al., 2007). The rate of any lifetime substance use disorder at age 17 or 18 in the general population is 22 percent (Merikangas et al., 2010).

In the Midwest study, past year rates of alcohol and other drug disorders appear to increase over time (Courtney et al., 2011). Table 3 describes the prevalence rates of alcohol and other drug disorders in the Midwest study from ages 19 to 26. The past year rate of alcohol abuse/dependence and other drug abuse/dependence at ages 19 and 21 is 8 percent/3 percent and 9 percent/3 percent respectively. At age 26, the past year rate of alcohol abuse/dependence and other drug abuse/dependence is 16 percent/13 percent and 23 percent/20 percent, respectively. This suggests that peak prevalence of substance use disorders may occur later for foster youth than in the general population, which tends to peak between ages 18 and 20, and gradually decline over time (Abuse, 2012). To illustrate further, the past 30 day use of illicit substances and past year alcohol dependence were 7- and 6-percent among adults 26 and older (Abuse, 2012). Kessler, Chiu et al., (2005) in a sample of 18–29 year olds, report past year rates of 3 percent and 1 percent and 0.4 percent for alcohol abuse/dependence and other drug abuse/dependence disorders, respectively.

Table 3 also reports the rates of mental health and substance abuse disorders within the past year among foster care alumni who were between the ages of 20–26 (n=318) at the time of the interview. While the Casey National Study does not provide data on whether rates change over time, these findings suggest that a significant proportion of young adults who were formerly placed in foster care are still in need of mental health and/or substance use services. An overwhelming 20-percent of the alumni participants met criteria for PTSD, almost one out of every five adults were diagnosed with at least one substance abuse disorder and nearly half of the sub-sample was diagnosed with at least one mental health disorder.

Mental Health Service Utilization

As youth make the transition into adulthood use of mental health services declines over time. In Table 4, the rates of service use among 17 or 18 year olds are found in the left hand columns and the rates of service use among 19 year olds or older are provided in the right hand columns. At age 17 or 18, lifetime rates of mental health service use range from a low of 50 percent (Shin, 2005) to a high of 94 percent (McMillen et al., 2004). Past year rates of mental health service use range from a low of 47 percent (Courtney et al., 2001) to a high of 83 percent (McMillen et al., 2004).

Two studies of foster youth transitioning to adulthood report past year rates of psychiatric hospitalization at ages 17 or 18. The rate of past year hospitalization ranges from a low of 7 percent (Courtney et al., 2004) to a high of 15 percent (McMillen et al., 2004). Similarly, these two studies report rates of past year alcohol or drug treatment at ages 17 or 18. The rate of past year substance treatment ranges from a low of 3 percent (McMillen et al., 2004) to a high of 14 percent (Courtney et al., 2004). From 1987 to 2008, the average annual rate of residential substance use treatment (2 percent) and other substance treatments (6 percent) has been low among high school seniors (Ilgen et al., 2011)

Over time, the Midwest study found a decrease in past year mental health service use from 36 percent at ages 17 or 18, 21 percent at age 19, and 10 percent at age 21. Similarly, using a reduced sample of all participants with interviews at ages 17 and 19 in the Voyages study, (McMillen & Raghavan, 2009) find that mental health service falls from 35 percent at age 17 to 10 percent at age 19. A pattern of decline in service use is similarly observed among transition-aged peers in the general population (Pottick, Bilder, Stoep, Warner, & Alvarez, 2008).

The Midwest study also observed a decline in psychotropic medication use. At age 17 or 18 there are 23 percent of youth that report using psychotropic medications in the past year (Courtney et al., 2004). By age 21, the rate of medication use (since last interview) dropped to 13 percent. There is a similar pattern of decline observed in medication use from 35 percent at age 17 to 13 percent at age 19 among foster youth in the Voyages study (McMillen et al., 2005).

Discussion

This review is the first to review the empirical research on the mental health functioning of foster youth transitioning to adulthood. The overall picture that emerges is that foster youth experience lifetime and past year rates of mental health disorders that are between 2 to 4 times higher than the general population of transition aged adults. Although mental health services could offer protective benefits, a sharp decline in mental health service use and medications is observed as foster youth transition to adulthood. These findings suggest the need to focus future attention in three main areas.

Setting a common research agenda

One unmistakable conclusion of this review is that knowledge of mental health and substance use disorders should be systematically expanded in future research. Similar to major epidemiological investigations, the age and severity of symptoms should be reported. This would increase understanding of whether prevalence rates during the transition to adulthood represent a continuation of problems from childhood or adolescence, or represent the occurrence of new problems. Steps should be taken to standardize the indicators that describe any lifetime, past year, or co-occurrence of mental health disorders. Incorporating expertise from other fields may also be instrumental in guiding knowledge development in this area. For instance, because problematic alcohol use falls on a continuum and adolescents may not meet criteria for a disorder, studies that focus on alcohol use disorders in adolescence identify 'problematic alcohol use' as the occurrence of behaviors that meet criteria for one or two DSM-IV symptoms of alcohol dependence, but not an alcohol use disorder (Rohde, Lewinsohn, Kahler, Seeley, & Brown, 2001). Using this indicator, studies find that adolescents experiencing sub-levels of problematic alcohol use often require treatment (Rohde et al., 2001). Upcoming changes in the DSM-V may eliminate the substance abuse diagnosis by merging it with dependence and lowering the threshold to two or more symptoms (American Psychiatric Association, 2012), underscoring the need to incorporate expertise and changing developments into future research on foster youth and mental health.

Routine screening and empirically supported treatments

Lifetime and past year rates of PTSD and conduct disorder that are between 2 and 4 times higher than in the general population suggest a need for routine screening of common disorders. The public health costs of mental health disorders are high. In a recent study, the lower bound estimates of the costs of conduct disorder from ages 7 to 14 are as high as \$70,000 (Foster & Jones, 2005). Of concern for young adults are the serious social consequences of psychiatric impairment to educational attainment (Kessler, Foster, Saunders, & Stang, 1995) and occupational productivity (Kessler & Frank, 1997). Although several empirically supported interventions exist to treat behavioral disorders and PTSD and there is a substantial body of evidence supporting the effectiveness of parenting and family interventions for conduct problems (Chambless & Ollendick, 2001) and cognitive and behavioral interventions for trauma (Cohen, Mannarino, Deblinger, & Berliner, 2009; Cohen, Berliner, & Mannarino, 2010), specific information concerning the clinical decision making of foster youth who are without permanence is limited. For both the treatment of conduct disorders and childhood trauma, empirically supported interventions typically include a caregiver as an integral participant in treatment (Chamberlain & Reid, 1998; Ghosh Ippen, Harris, Van Horn, & Lieberman, 2011). In at least one study, participants who did not have a caregiver to receive the treatment experienced fewer benefits of the intervention (Chamberlain & Reid, 1991). More research is needed about the clinical interventions that are provided to older foster youth who are without permanence, and at a minimum, the clinical decisions that are made on their behalf.

The mixed findings with respect to substance use disorders at ages 17 or 18 are consistent with older studies (Courtney & Heuring, 2005). These findings highlight the lack of attention that has been given to DSM-IV alcohol and other drug disorders. The findings of this review along with the findings from several older studies, nevertheless, suggest cause for concern. For instance, in one study comparing substance use disorders among foster youth ages 13 to 18 served in five large service systems, past year diagnoses are less prevalent among child welfare system involved youth compared with youth served in other large service systems, but are nonetheless as high as 19 percent for a lifetime and 11 percent for a past year substance use disorder (Aarons, Brown, Hough, Garland, & Wood, 2001;

Aarons & Palinkas, 2007). Several older surveys of former foster youth additionally point to elevated rates of illicit substance use. In a convenience sample of foster youth in California, for instance, Barth (1990) reported that over half of the sample reported using street drugs since leaving foster care. More recently, Vaughn et al., (2007) find that almost half the sample reported using an illicit drug before age 17. Given that ninety percent of those who develop substance dependence in their lifetime begin using substances before the age of 18, with half beginning use prior to age 15 (Dennis, White, & Ives, 2009), greater attention to patterns of use over time is needed.

Integration and planning between child and adult mental health service systems

Recent knowledge of the importance of the transition to adulthood highlights how much can be gained or lost during the transition. The recent expansion of the Medicaid option to age 21 under the Chafee Act along with the extension of eligibility to the age of 25 under the Affordable Care Act provides young adults with critical opportunities to access health and mental health care services in adulthood. The sharp decline in mental health service use during the transition to adulthood nevertheless reflects a much more problematic divide between child and adult serving systems (Davis, Koroloff, & Ellison, 2012; Manteuffel, Stephens, Sondheimer, & Fisher, 2008). In many states across the country, few linkages exist to connect transition aged youth to adult service systems. There is also limited knowledge of effective models of engagement by adult service systems providers. Because coordinated and engaging services across child and adult systems are an integral part of preventing outcomes from worsening in adulthood, greater attention should be given to developing practice models that integrate services and supports, and promote effective engagement with transition aged adults. Emerging findings from the Partnerships for Youth Transition, a grant program that funded five sites in the United States from 2003 to 2007 to integrate child and adults systems of care for individuals with serious mental illness, suggests that targeted efforts can increase relationships between child and adult serving organizations (Davis et al., 2012).

The current challenges for child welfare agencies and service systems are to disseminate practice interventions that have a public health impact. Programs promoting outcomes of foster youth in adulthood have not demonstrated an impact, beyond the benefit that should not be underestimated of remaining in foster care past age 18 (Courtney et al., 2011; U.S. Department of Health and Human Services, 2008a; U.S. Department of Health and Human Services, 2008b). Given that new findings in neuroscience and psychology suggest that altering trajectories of adolescents can have a larger scale impact on health and other behaviors than the same intervention provided later in life (Dahl, 2004) and adolescents represent the second largest population of children served by the child welfare system behind infants (Wulczyn, Barth, Yuan, Harden, & Landsverk, 2005), opportunities abound for strengthening, sustaining, and disseminating practice interventions within child welfare agencies and across other service systems that can effectively respond to, address, and promote psychosocial development.

Limitations

Although the findings in this review point to directions for future research and practice, any interpretation of these findings should be done in the context of individual study limitations and the use of cross study comparisons. The biggest reason to use caution in interpreting the findings from this review has to do with the few studies that have assessed for mental health disorders using a standardized diagnostic assessment. This body of research reflects a small number of studies that have used different sample selection eligibility criteria, diagnostic instruments, and single-disorder assessments. The lack of standardization in the

measurement of mental health disorders had made the identification of need a challenge to understand.

Child welfare policy varies between states, within county administered states, and between counties (Courtney, 2000). Therefore, differences in the rate of mental health disorders and mental health service use may be attributable to differences in state policies governing placement criteria and service provision, as well as the variation that is expected in age, gender, and race across state foster care populations. Recent studies point to significant differences in the rate of any lifetime mental health disorder by race (Garcia & Courtney, 2011) and by gender (Keller, Salazar et al., 2010) among youth in foster care transitioning into adulthood. While not within the scope of this review to discuss in detail, these emerging findings suggest a need to gain understanding of the processes and pathways by which these group differences emerge.

Third, epidemiological studies find that single wave cross-sectional studies are likely to underestimate the prevalence of past year mental health disorders. Because much of the research in this area has relied upon single wave descriptions within a longitudinal study, the estimates may actually be low (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Costello et al., 2003). Studies of foster youth that capture patterns of past year mental health disorders across multiple waves of prospective data could not be located. One limitation resulting from a predominantly static view of mental health is partial understanding of trajectories, and the factors that predict different courses of illness and/or recovery.

Fourth, the extent to which these findings are representative of and generalizable to all foster youth making the transition to adulthood in the United States is unclear. The studies we reviewed commonly excluded youth exhibiting impairments related to serious mental illness or psychiatric hospitalization. It may then follow that the rate of serious mental health disorders among this population is higher.

Another limitation has to do with the paucity of information that is provided about mental health disorders and service use. Dimensions such as the duration, severity, and co-occurrence of mental health disorders, alcohol and other drug use/dependence disorders, developmental disorders, and other chronic health problems are for the most part absent from this body of research even though these aspects of functioning arguably hold great significance for any strategy aimed at effective treatment.

Conclusion

The lack of current and comprehensive information about the mental health of foster youth transitioning to adulthood presents a gap in the existing knowledge with relevance to prevention and intervention. In the interest of providing guidance for research and intervention development, we review the research on aging out foster youth and mental health to gain better understanding of where to focus the development and implementation of targeted services that will have the most influential impact on the lives of youth transitioning into adulthood. These findings suggest the need to focus future attention in three main areas: 1) Setting a common research agenda to study mental health and service use; 2) Routine screening and empirically supported treatment of common conditions; and 3) Integration and planning between child and adult mental health and other service systems.

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References

- Aarons GA, Brown SA, Hough RL, Garland AF, Wood PA. Prevalence of adolescent substance use disorders across five sectors of care. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2001; 40(4):419–426. [PubMed: 11314567]
- Aarons GA, Palinkas LA. Implementation of evidence-based practice in child welfare: Service provider perspectives. *Administration and Policy in Mental Health and Mental Health Services Research*. 2007; 34(4):411–419. [PubMed: 17410420]
- SAMHSA. Substance Abuse and Mental Health Services Administration. Washington, D.C: SAMHSA; 2012. Mental health services administration. results from the 2010 national survey on drug use and health: Summary of national findings.
- Barth RP. On their own: The experiences of youth after foster care. *Child and Adolescent Social Work Journal*. 1990; 7(5):419–440.
- Blakemore SJ, Choudhury S. Development of the adolescent brain: Implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry*. 2006; 47(3–4):296–312. [PubMed: 16492261]
- California Youth Connection. Foster youth proposals to improve mental health services: The consumer's perspective. CA: California Youth Connection; 2000.
- Chamberlain P, Reid JB. Using a specialized foster care community treatment model for children and adolescents leaving the state mental hospital. *Journal of Community Psychology*. 1991; 19(3):266–276.
- Chamberlain P, Reid JB. Comparison of two community alternatives to incarceration for chronic juvenile offenders. *Journal of Consulting and Clinical Psychology*. 1998; 66(4):624. [PubMed: 9735578]
- Chambless DL, Ollendick TH. Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology*. 2001; 52(1):685–716.
- Clausen JM, Landsverk J, Ganger W, Chadwick D, Litrownik A. Mental health problems of children in foster care. *Journal of Child and Family Studies*. 1998; 7(3):283–296.
- Cohen JA, Berliner L, Mannarino A. Trauma focused CBT for children with co- occurring trauma and behavior problems. *Child Abuse & Neglect*. 2010; 34(4):215–224. [PubMed: 20304489]
- Cohen, JA.; Mannarino, AP.; Deblinger, E.; Berliner, L. Cognitive-behavioral therapy for children and adolescents. In: Foa, Edna B.; Keane, Terence M.; Friedman, Matthew J.; Cohen, Judith A., editors. *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies*. 2. New York, NY, US: Guilford Press; 2009. p. 223-244.
- Cook, R. Phase 2 Final Report. Vol. 1 and 2. Rockville, MD: Westat, inc; 1991. A national evaluation of title IV-E foster care independent living programs for youth.
- Courtney ME, Dworsky A. Early outcomes for young adults transitioning from out-of-home care in the USA. *Child & Family Social Work*. 2006; 11(3):209–219.
- Courtney, ME.; Heuring, DH. The transition to adulthood for youth “aging out” of the foster care system. In: Osgood, DW.; Flannagan, C.; Cusick, GC., editors. *On Your Own without a Net: The Transition to Adulthood for Vulnerable Populations*. Chicago, IL: University of Chicago Press; 2005. p. 27-67.
- Courtney ME, Piliavin I, Grogan-Kaylor A, Nesmith A. Foster youth transitions to adulthood: A longitudinal view of youth leaving care. *Child Welfare*. 2001; 80(6):685–718. [PubMed: 11817658]
- Courtney, ME. Society for Research in Child Development. Society for Research in Child Development. 2009. The difficult transition to adulthood for foster youth in the US: Implications for the state as corporate parent.
- Courtney, ME.; Terao, S.; Bost, N. Midwest evaluation of the adult functioning of former foster youth: Conditions of youth preparing to leave state care. Chicago, IL: Chapin Hall Center for Children at the University of Chicago; 2004.

- Courtney, ME.; Zinn, A.; Johnson, H.; Malm, K. Report # 2011–14. Washington, D.C: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services; 2008a. Evaluation of the Massachusetts adolescent outreach program for youths in intensive foster care: Final report.
- Courtney, ME.; Zinn, A.; Koralek, R.; Bess, R. Report #201113. Washington, D.C: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services; 2011. Evaluation of the independent living-employment services program, Kern County, California: Final report.
- Dahl RE. Adolescent brain development: A period of vulnerabilities and opportunities. keynote address. *Annals of the New York Academy of Sciences*. 2004; 1021(1):1–22. [PubMed: 15251869]
- Davis M, Koroloff N, Ellison ML. Between adolescence and adulthood: Rehabilitation research to improve services for youth and young adults. *Psychiatric Rehabilitation Journal*. 2012; 35(3):167–170. [PubMed: 22246114]
- Dennis ML, White MK, Ives ML. Individual characteristics and needs associated with substance misuse of adolescents and young adults in addiction treatment. *Adolescent Substance Abuse*. 2009; 9(1):45–72.
- Dishion TJ, Andrews DW. Preventing escalation in problem behaviors with high- risk young adolescents: Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology*. 1995; 63(4):538. [PubMed: 7673531]
- dosReis S, Zito JM, Safer DJ, Soeken KL. Mental health services for youths in foster care and disabled youths. *American Journal of Public Health*. 2001; 91(7):1094. [PubMed: 11441737]
- Festinger, T. No one ever asked us: A postscript to foster care. Columbia University Press; New York: 1983.
- Foster EM, Jones DE. The high costs of aggression: Public expenditures resulting from conduct disorder. *American Journal of Public Health*. 2005; 95(10):1767. [PubMed: 16131639]
- Fowler PJ, Toro PA, Miles BW. Pathways to and from homelessness and associated psychosocial outcomes among adolescents leaving the foster care system. *American Journal of Public Health*. 2009; 99(8):1453. [PubMed: 19542038]
- Garcia A, Courtney ME. Prevalence and predictors of service utilization among racially and ethnically diverse adolescents in foster care diagnosed with mental health and substance abuse disorders. *Journal of Public Child Welfare*. 2011; 5:1–25.10.1080/15548732.2011.617277
- Ghosh Ippen C, Harris WW, Van Horn P, Lieberman AF. Traumatic and stressful events in early childhood: Can treatment help those at highest risk? *Child Abuse & Neglect*. 2011; 35(7):504–513. [PubMed: 21816474]
- Goerge, RM.; Bilaver, L.; Lee, BJ.; Needell, B.; Brookhart, A.; Jackman, W. Employment outcomes for youth aging out of foster care. Chapin Hall Center for Children, University of Chicago; 2002.
- Griffin BA, Ramchand R, Edelen MO, McCaffrey DF, Morral AR. Associations between abstinence in adolescence and economic and educational outcomes seven years later among high-risk youth. *Drug and Alcohol Dependence*. 2011; 113(2):118–124. [PubMed: 20797825]
- Halfon N, Berkowitz G, Klee L. Mental health service utilization by children in foster care in california. *Pediatrics*. 1992; 89(6):1238–1244. [PubMed: 1594382]
- Halfon N, Mendonca A, Berkowitz G. Health status of children in foster care: The experience of the center for the vulnerable child. *Archives of Pediatrics and Adolescent Medicine*. 1995; 149(4):386. [PubMed: 7704166]
- Harman JS, Childs GE, Kelleher KJ. Mental health care utilization and expenditures by children in foster care. *Archives of Pediatrics and Adolescent Medicine*. 2000; 154(11):1114. [PubMed: 11074852]
- Havlicek J, McMillen JC, Fedoravicius N, McNelly D, Robinson D. Conceptualizing the step-down for foster youth approaching adulthood: Perceptions of service providers, caseworkers, and foster parents. *Children and Youth Services Review*. 2012
- Hill K, Lightfoot E, Kimball E. Foster care transition services for youth with disabilities: Findings from a survey of county service providers. *Child Welfare*. 2010; 89(6):63–81. [PubMed: 21877564]

- Horowitz SMC, Simms MD, Farrington R. Impact of developmental problems on young children's exits from foster care. *Journal of Developmental and Behavioral Pediatrics*, 15. 1994; (2):105.
- Ilgen MA, Schulenberg J, Kloska DD, Cxyz E, Johnston L, O'Malley P. Prevalence and characteristics of substance abuse treatment utilization by US adolescents: National data from 1987 to 2008. *Addictive Behaviors*. 2011; 36(12):1349–1352. [PubMed: 21885197]
- Jayakody R, Danziger S, Kessler RC. Early-onset psychiatric disorders and male socioeconomic status. *Social Science Research*. 1998; 27(4):371–387.
- Kandel DB, Davies M, Karus D, Yamaguchi K. The consequences in young adulthood of adolescent drug involvement: An overview. *Archives of General Psychiatry*. 1986; 43(8):746. [PubMed: 3729669]
- Keller TE, Salazar AM, Courtney ME. Prevalence and timing of diagnosable mental health, alcohol, and substance use problems among older adolescents in the child welfare system. *Children and Youth Services Review*. 2010; 32(4):626–634. [PubMed: 20305829]
- Keller TE, Cusick GR, Courtney ME. Approaching the transition to adulthood: Distinctive profiles of adolescents aging out of the child welfare system. *The Social Service Review*. 2007; 81(3):453–484.10.1086/519536 [PubMed: 20057913]
- Kessler RC, Avenevoli S, Costello EJ, Georgiades K, Green JG, Gruber MJ, Petukhova M. Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry, archgenpsychiatry*. 2011 2011.160 v1.
- Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*. 2005; 62(6):593. [PubMed: 15939837]
- Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*. 2005; 62(6):617. [PubMed: 15939839]
- Kessler RC, Foster CL, Saunders WB, Stang PE. Social consequences of psychiatric disorders I: Educational attainment. *The American Journal of Psychiatry*. 1995; 152(7):1026. [PubMed: 7793438]
- Kessler RC, Frank RG. The impact of psychiatric disorders on work loss days. *Psychological Medicine*. 1997; 27(4):861–873. [PubMed: 9234464]
- Kushel MB, Yen IH, Gee L, Courtney ME. Homelessness and health care access after emancipation: Results from the midwest evaluation of adult functioning of former foster youth. *Archives of Pediatrics & Adolescent Medicine*. 2007; 161(10):986–993.10.1001/archpedi.161.10.986 [PubMed: 17909143]
- Landsverk, J.; Garland, AF. Foster care and pathways to mental health services. In: Curtis, Patrick A.; Dale, Grady, Jr; Kendal, Joshua C., editors. *Foster Care Crisis: Translating Research into Policy and Practice*. University of Nebraska Press; 1999.
- Leslie LK, Hurlburt MS, Landsverk J, Barth R, Slymen DJ. Outpatient mental health services for children in foster care: A national perspective. *Child Abuse & Neglect*. 2004; 28(6):699–714. [PubMed: 15193856]
- Leslie LK, Landsverk J, Ezzet-Lofstrom R, Tschann JM, Slymen DJ, Garland AF. Children in foster care: Factors influencing outpatient mental health service use. *Child Abuse & Neglect*. 2000; 24(4):465–476. [PubMed: 10798837]
- Manteuffel B, Stephens RL, Sondheimer DL, Fisher SK. Characteristics, service experiences, and outcomes of transition-aged youth in systems of care: Programmatic and policy implications. *Journal of Behavioral Health Services & Research*. 2008; 35(4):469–487.10.1007/s11414-008-9130-6 [PubMed: 18618264]
- Masten, AS. Promoting resilience in development: A general framework for systems of care. In: Flynn, RJ.; Dudding, PM.; Barber, J., editors. *Promoting resilience in child welfare*. 1. Ottawa, Ontario: University of Ottawa Press; 2006. p. 3
- Masten, AS.; Obradovi , J.; Burt, KB. Resilience in emerging adulthood: Developmental perspectives on continuity and transformation. In: Arnett, JJ.; Tanner, JL., editors. *Emerging adults in America:*

Coming of age in the 21st century. Washington, D.C: American Psychological Association Press; 2006.

- McMillen JC, Raghavan R. Pediatric to adult mental health service use of young people leaving the foster care system. *Journal of Adolescent Health*. 2009; 44(1):7–13. [PubMed: 19101453]
- McMillen JC, Zima BT, Scott LD Jr, Auslander WF, Munson MR, Ollie MT, Spitznagel EL. Prevalence of psychiatric disorders among older youths in the foster care system. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2005; 44(1):88–95. [PubMed: 15608548]
- Merikangas KR, He J, Burstein M, Swanson SA, Avenevoli S, Cui L, Swendsen J. Lifetime prevalence of mental disorders in US adolescents: Results from the national comorbidity survey replication-adolescent supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*. 2010; 49(10):980–989. [PubMed: 20855043]
- Montgomery P, Donkoh C, Underhill K. Independent living programs for young people leaving the care system: The state of the evidence. *Children and Youth Services Review*. 2006; 28(12):1435–1448. [10.1016/j.childyouth.2006.03.002](https://doi.org/10.1016/j.childyouth.2006.03.002)
- Narendorf SC, Fedoravicius N, McMillen JC, McNelly D, Robinson DR. Stepping down and stepping in: Youth's perspectives on making the transition from residential treatment to treatment foster care. *Children and Youth Services Review*. 2011; 34(1):43. [PubMed: 22247580]
- Narendorf SC, McMillen JC. Substance use and substance use disorders as foster youth transition to adulthood. *Children and Youth Services Review*. 2010; 32(1):113–119. [PubMed: 20161424]
- Needell, B.; Cuccaro-Alamin, S.; Brookhart, A.; Jackman, W.; Shlonsky, A. Youth emancipating from foster care in California: Findings using linked administrative data. University of California, Berkeley, Center for Social Services Research; Berkeley: 2002.
- Pecora PJ, Jensen PS, Romanelli LH, Jackson LJ, Ortiz A. Mental health services for children placed in foster care: An overview of current challenges. *Child Welfare*. 2009; 88(1):5–26. [PubMed: 19653451]
- Pottick KJ, Bilder S, Stoep AV, Warner LA, Alvarez MF. US patterns of mental health service utilization for transition-age youth and young adults. *Journal of Behavioral Health Services & Research*. 2008; 35(4):373–389. [10.1007/s11414-007-9080-4](https://doi.org/10.1007/s11414-007-9080-4) [PubMed: 18026842]
- Raghavan R, McMillen JC. Use of multiple psychotropic medications among adolescents aging out of foster care. *Psychiatric Services (Washington, DC)*. 2008; 59(9):1052–1055. [10.1176/appi.ps.59.9.1052](https://doi.org/10.1176/appi.ps.59.9.1052)
- Reilly T. Transition from care: Status and outcomes of youth who age out of foster care. *Child Welfare*. 2003; 82(6):727–746. [PubMed: 14736032]
- Rohde P, Lewinsohn PM, Kahler CW, Seeley JR, Brown RA. Natural course of alcohol use disorders from adolescence to young adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2001; 40(1):83–90. [PubMed: 11195569]
- Schulenberg JE, Sameroff AJ, Cicchetti D. The transition to adulthood as a critical juncture in the course of psychopathology and mental health. *Development and Psychopathology*. 2004; 16(4):799–806. [PubMed: 15704815]
- Shin SH. Need for and actual use of mental health service by adolescents in the child welfare system. *Children and Youth Services Review*. 2005; 27(10):1071–1083.
- Steinberg L, Graham S, O'Brien L, Woolard J, Cauffman E, Banich M. Age differences in future orientation and delay discounting. *Child Development*. 2009; 80(1):28–44. [PubMed: 19236391]
- Takayama JI, Bergman AB, Connell FA. Children in foster care in the state of Washington. *JAMA: The Journal of the American Medical Association*. 1994; 271(23):1850. [PubMed: 8196142]
- Tough, P. *How children succeed: Grit, curiosity, and the hidden power of character*. Boston, MA: Houghton Mifflin Harcourt; 2012.
- Trupin EW, Tarico VS, Low BP, Jemelka R, McClellan J. Children on child protective service caseloads: Prevalence and nature of serious emotional disturbance. *Child Abuse & Neglect*. 1993; 17(3):345–355. [PubMed: 8330221]
- U.S. Department of Health and Human Services. Evaluation of the early start to emancipation preparation tutoring program: Los Angeles County. Washington, D.C: Administration for Children and Families; 2008a.

- U.S. Department of Health and Human Services. Evaluation of the life skills training program: Los Angeles County. Washington, D.C: Administration for Children and Families; 2008b.
- Vander Stoep A, Beresford SAA, Weiss NS, McKnight B, Cauce AM, Cohen P. Community-based study of the transition to adulthood for adolescents with psychiatric disorder. *American Journal of Epidemiology*. 2000; 152(4):352–362. [PubMed: 10968380]
- Wulczyn, F.; Barth, RP.; Yuan, YT.; Harden, B.; Landsverk, J. *Beyond common sense: Child welfare, child well-being, and the evidence for policy reform*. Chicago, IL: Chapin Hall at the University of Chicago; 2005.

Highlights

- We review research on aging out foster youth, mental health and service use.
- Mental health disorders are 2 to 4 times higher than in the general population.
- Rate of mental health service use declines during the transition to adulthood.
- Our discussion identifies three areas to focus future efforts.

Table 1
 Research Meeting Eligibility Criteria for Review of Mental Health Disorders and Service Use among Foster Youth

Author	Sample Size	Sample Exclusion Criteria	Data Collection Methods	Study Limitations
Barth (1990)	55	<ul style="list-style-type: none"> Youth in criminal justice, mental health or child welfare system (cws); Discharge from cws < 1 year or > 10 years 	Face to face interviews	Snowball sampling methods were implemented in one city. Findings may not be generalizable to all former foster youth.
Courtney et al. (2001)	Wave 1: 141 Wave 2: 113	<ul style="list-style-type: none"> Developmental disability (dd) 	Face to face interviews	The sample size is small, reflects a population in Wisconsin, and findings may not be generalizable to youth in other states.
Courtney et al. (2004; 2005; 2007; 2010; 2011); Keller et al., 2010	Wave 1: 732 Wave 2: 603 Wave 3: 591 Wave 4: 602 Wave 5: 596	<ul style="list-style-type: none"> In jail or psychiatric hospital Mental illness or development disability Non-English speaking Foster care for reason other than child maltreatment 	Face to face interviews	The Midwest study excluded youth who could not participate in an interview due to incarceration or psychiatric hospitalization at the time of the interview' and severe mental illness.
McMillen & Tucker (1999)	252	<ul style="list-style-type: none"> Discharged Case open for adoption subsidies only < 6 months in care Unable to locate 	Administrative data & case file review	The use of state child welfare administrative data precludes detailed information about mental health service use.
McMillen et al. (2004; 2005); McMillen & Raghavan (2009); Vaughn et al. 2007)	Wave 1: 406 Wave 9: 325	<ul style="list-style-type: none"> IQ < 70 or communication disorder Discharged or on run Lives > 100 miles past study area 	Face to face interviews	Inclusion criteria do not indicate that participants entered foster care due to child abuse and neglect as opposed to delinquency or behavioral problems.
Needell et al., 2002	10,228	<ul style="list-style-type: none"> Records without social security information 	Linked administrative data review	The use of administrative data precludes detailed information about mental health service use. In addition, disorders are placed into broad categories that make it a challenge to report specific disorders, such as PTSD.
Pecora et al., (2009)	1,087	<ul style="list-style-type: none"> Placed with a Casey foster family <12 months Discharged from foster care at least 12 months before interview 	Case file review and face to face interviews	It could be that the characteristics of participants differ from the general population of aging out foster youth. In the general study of 1087 participants (aged 20–51), it is important to point out that not all participants aged out of foster care. Given the focus of this review, we report rates among alumni who were between the ages 20 to 26 (n=318) during the interview.
Shin (2005)	113	<ul style="list-style-type: none"> In substitute care < 6 months Placed in restrictive care setting 	Face to face interviews & administrative data review	The use of sample selection criteria, which restricted the inclusion of youth in residential treatment, precludes information about a population assumed to have high mental health needs.

Author	Sample Size	Sample Exclusion Criteria	Data Collection Methods	Study Limitations
Shook et al. (2011)	1,361	<ul style="list-style-type: none"> • Run away; jail, or development disability • Did not turn 17 in foster care 	Retrospective administrative data review	This study's findings of cross system involvement is representative of those youth who receive services in one county. Therefore the findings may not reflect the experiences of youth served in multiple counties.

Table 2
Lifetime and 12-Month Mental Health Prevalence Rates of Foster Youth Ages 17 or 18

	Lifetime				12-Month	
	Shin (N=113)	Foster Youth VOYAGES (N=373)	Midwest Study (N=732) ^f	General Population NCS-A (N=2,356)	Foster Youth VOYAGES (N=373)	General Population NCS-A (N=2,356)
Diagnostic Measure	<i>ICD-9</i>	<i>DIS</i>	<i>CIDI</i>	<i>CIDI</i>	<i>DIS</i>	<i>CIDI</i>
Mental Health Disorder						
Major Depression	32.0	27.0	10.5	15.4	18.0	10.0
ODD/CD	40.0	47.0		13.6/9.6	17.0	8.1/6.7
PTSD		14.0	15.1	7.0	8.0	5.0
ADHD	13.0	20.0		-	10.0	-
Mania		6.0			6.0	
Adjustment disorder	32.0					
Bipolar	9.0			4.3		
Any Mental Health Disorder	66.0	61.0		59.5	37.0	49.2
Substance Use Disorder						
Alcohol Abuse			9.8			
Alcohol Dependence			4.2			
Any Alcohol			14.1	14.5		10.4
Drug Abuse			5.0			
Drug Dependence			4.8			
Any Drug			7.0	16.3		9.2
Any Substance Use Disorder		37.0	19.7	22.3	17.9	15.2
Any 2+ Disorders		32.0		36.8	15.0	24.6

^fThese lifetime prevalence rates include callback information that is reported in Keller et al. (2010) and therefore differ from the information reported in Courtney et al. (2004).

Table 3

12-Month Mental Health Prevalence Rates of Foster Youth ages 19 to 26.

	Midwest Study		Casey National Study
	19	21	26
<i>Age</i>			20–26
<i>Diagnostic Measure</i>		CIDI	CIDI
<i>Type of Mental Health Disorder</i>			
Major Depression	5.6	7.6	-
ODD/CD			-
PTSD	6.0	7.9	-
ADHD			-
Mania			-
Any Mental Health Disorder	25.0	14.2	-
<i>Type of Substance Use Disorder</i>			
Alcohol Abuse	7.6	7.3	16.0
Alcohol Dependence	3.0	6.9	13.0
Any Alcohol		14.2	
Drug Abuse	9.3	3.7	23.0
Drug Dependence	3.2	2.9	20.0
Any Drug		5.4	
Any Substance Use Disorder		15.8	
			18.2

Table 4

Lifetime and Past Year Prevalence of Mental Health Service Use

Study	17 or 18 Years						19 + Years						
	McMillen & Tucker (1999)	Courtney et al. (2001)	Needell et al. (2002)	Courtney et al. (2003)	Shin (2005)	McMillen et al. 2004)	McMillen & Raghavan (2009)	Midwest study(Courtney et al. 2005, 2007, 2010; 2011)			Barth (1990)	Shook et al. (2011)	
Sample Size	N=252	N=141	N=10,225	N=732	N=113	N=406	N=325	N=603	N=591	N=602	N=596	N=55	N=1,361
Age	17	17-18	17-18	17-18	17	17	19	19	21	23-24	26	17-26	18-23
Any individual counseling													
Lifetime					78.0	73.0							71.0
12-Months		43.1		36.5		52.0	10.0	20.6	10.5	11.3	11.9	78.0	
Drug or Alcohol Treatment													
Lifetime					64.0	8.0							
12-Months				13.5		3.0	13.0	7.5	3.6	5.1	4.2	64.0	41.0
Medication for Emotional Problems													
Lifetime					20.0								55.0
12-Months		17.8		22.5		37.0	13.0	15.4	12.7	11.8	14.5		
Psychiatric Hospitalization													
Lifetime	44.0				15.0	42.0			12.5				28.0
12-Months		6.6		7.1		15.0	3.0	2.0	2.5	2.0	5.0		
Any mental health Service													
Lifetime			62.0		50.0	94.0							84.0
Past year		47.0		47.7		83.0		29.4	18.6	19.0	19.5		