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Predictors of Behavioral Health Service Utilization in a Medicaid Enrolled Sample of Emerging Adults

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Abstract

Emerging adults (EA), individuals between the ages of 15-26, face many challenges in their transition to a new developmental stage, especially those with behavioral health concerns who do not receive the supports they need. Many EA drop out of services at 18, which is likely due in part to the need to transition to the adult service system and the lack of available transition support services in child/adolescent service systems. Though this is a clear disparity, research on EA service utilization, especially those enrolled in Medicaid and with co-occurring conditions, is rare. This paper begins to address this gap by examining variables at age 17 that predict the service utilization of continuously Medicaid enrolled EA at age 18. Data came from an administrative dataset. The sample had 4,548 EA and 53% were female, 50% identified with a minority group, and 19% were child-welfare involved. Exploratory logistic regression analyses were used. Minority EA had lower odds of utilizing services at age 18. EA involved with child welfare had greater odds of utilizing services at age 18. EA with at least one Substance Use Disorder (SUD) and at least one mental health disorder at 17 had a higher likelihood of service utilization at 18, the opposite was true for EA with only SUDs. These findings identified predictors of service utilization for an understudied sample—EA enrolled in Medicaid. Results provided preliminary evidence that EA with SUD diagnoses access behavioral health services differently than those without a SUD diagnosis, and that it is fruitful to examine subgroups of EA when seeking to understand their service utilization patterns. Identifying predictors of service utilization during the transition period from the child to the adult system can help inform systems interventions to retain EA in services.

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Keywords

Emerging Adults; Transition Age Youth; Medicaid; Service Systems; Service Utilization; Service Drop Out

Introduction

Emerging adulthood is a developmental period in which biological, interpersonal, and psychological changes occur, such as changes in networks of support and responsibilities (Paul, Street, Wheeler, & Singh, 2015). These changes can be especially stressful for emerging adults (EA) experiencing behavioral health challenges, some for the first time (Paul et al., 2015). Their stress is likely exacerbated by the necessary transition from the child to the adult service system which involves new settings, procedures, and providers (Singh, 2009). Since the child and adult service systems are bifurcated, and transition support is sparse, many EA are left to navigate the system change on their own (Davis & Sondheimer, 2005). The need to transition without support is one of the reasons posited to contribute to the high number of EA discontinuing services around their eighteenth birthday (Clark, Deschenes, & Jones, 2000). Due to the high level of drop out among EA, it is crucial to understand predictors of their service utilization in order to prepare systems to intervene to prevent drop out during adolescence when a behavioral health need is indicated. Predictors of behavioral health service utilization have been examined for EA transitioning out of foster care (e.g., McMillen & Raghavan, 2009); however, less is known about the predictors of behavioral health service utilization of Medicaid enrolled EA. Therefore, to fill this gap in the literature, this paper seeks to identify the predictors of the behavioral health service utilization of continuously Medicaid enrolled EA as they transition to the adult system.

Systems and Behavioral Health Needs

For EA, especially those experiencing behavioral health challenges, life transitions, changing social structures, and shifts in responsibility may be taxing (Merikangas et al., 2011). The EA developmental period is also unique in that some behavioral health disorders have a median age of onset during this time (e.g., Substance Use Disorders (SUD), Bipolar Disorder, Schizophrenia) (Beiser et al., 1993). Compared to their peers, EA with behavioral health challenges have greater difficulty completing schooling, integrating into the adult workforce, and maintaining relationships (Davis et al., 2004; Davis & Vander Stoep, 1997).

An identifiable pattern of behavioral health service disengagement during emerging adulthood has been found in the research literature. For example, studies have consistently illustrated a decline in behavioral health service utilization, around 50 to 60%, from 17 to 18 years of age (Clark, Deschenes, & Jones, 2000; Clark, Unger, & Stewart, 1993; Davis & Sondheimer, 2005). These trends may result in EA lacking access to transition support to help them lead productive, meaningful lives as adults (Davis et al., 2004; Vander Stoep et al., 2000).

In addition to exacerbating disengagement, the bifurcation of the child and adult service systems also poses challenges for researchers seeking to understand the unique needs and service utilization patterns of this subgroup of EA. Child and adult service systems typically use different tracking mechanisms and may not regularly share data, which makes it difficult to study EA service utilization over time (Paul et al., 2015). Due to this data management barrier, longitudinal studies using systems data to understand the service utilization of individuals in treatment are usually conducted on adolescents or EA, but not the developmental period that is a pertinent bridge between the two. The lack of infrastructure to conduct research on the service utilization of EA at the systems level contributes to the gaps in knowledge about their characteristics and behaviors (Miller et al., 2016). Previous research has shown that some predictors of service utilization, such as full-time employment, differ in EA when compared to adolescence and adulthood (Miller et al., 2016). Due to this, detailed tracking and targeted analysis of EA is necessary to understand unique predictors of service utilization for this developmental period.

Medicaid Enrollment and Service Utilization

Attempting to maintain Medicaid enrollment during the transition from the child to the adult behavioral health service system adds unique challenges for EA. For example, due to age specific eligibility criteria for certain benefit packages, EA who receive services during the transition often face disenrollment from Medicaid without continuity into publicly funded adult services (Pullman, Heflinger, & Mayberry, 2010). Having Medicaid as an EA has been positively associated with using outpatient mental health services (Ringeisen, Casanueva, Urato, & Stambaugh, 2009). If Medicaid enrollment is disrupted, it often results in a decline in accessing and utilizing healthcare, and greater unmet medical need (Federico, Steiner, Beaty, Crane, & Kempe, 2007).

Few studies have tracked EA and their interactions with the Medicaid system longitudinally. Just one study was identified that tracked Medicaid enrolled EA over time, until age 23, and examined their predictors of disenrollment (Pullman et al., 2010). Funding through Social Security income, a diagnosis of developmental disability or schizophrenia, being enrolled in foster care, and being African-American were associated with maintaining Medicaid coverage (Pullman et al., 2010). Males were more likely to lose coverage than females, especially on their 18th and 19th birthdays, and, when compared to females, lost coverage earlier and were less likely to regain coverage. Pregnancy was one reason why female EA were more likely to maintain coverage during the study time frame (Pullman et al., 2010).

Overall, changing Medicaid requirements and confusion about eligibility may add to already existing EA frustrations about transitioning to a new behavioral health care system. The additional procedures and paperwork requirements may exacerbate their disengagement rate further. Understanding the unique predictors of service utilization for Medicaid enrolled EA can inform the design of systems interventions to retain them in services and identify unmet needs that may be unique to this subpopulation. Since only one longitudinal study was identified that tracked Medicaid enrolled EA over time, the following section on predictors of service utilization focuses on this domain more broadly.

Predictors of Service Utilization

Gender has been identified as a predictor of service utilization. Across age groups, studies have consistently shown that women were more likely to utilize behavioral health services than men (Rhodes, Goering, To, & Williams, 2002). As one example, Karlin, Duffy, and Gleaves (2008) found that women between the ages of 18-64 were 1.5 times more likely to use outpatient mental health services than men.

Race/ethnicity has also been identified as a predictor of EA service utilization, and has brought attention to behavioral health service utilization disparities for minority groups. For example, in three studies, Non-Hispanic White EA were more likely than minority EA to receive outpatient behavioral health services (Miller et al., 2016; Pottick, Warner, Vander Stoep, & Knight, 2014; Ringeisen et al., 2009), and in one study, the discrepancy grew as EA aged (Pottick et al., 2014). Similar utilization disparities have been found in high risk youth in the public service sector. Controlling for other factors related to service use, Garland and colleagues (2005) discovered that African-American and Asian-American youth were half as likely to receive any behavioral health services when compared to Non-Hispanic Whites. Though this disparity is relatively well established in the literature, less is known about whether belonging to a minority group is a risk factor for service drop out in continuously Medicaid enrolled EA.

In addition to Medicaid, another system EA may be involved with is child welfare. The majority of studies examining the service utilization of systems involved EA center around understanding those transitioning out of foster care. Involvement with child welfare can be protective for EA continuous service engagement, as EA involved with child welfare can remain enrolled in Medicaid until age 21. There are also support programs provided by states; the John F. Chafee Foster Care Independence Program provides EA planning to transition out of foster care with access to up to 15 services to prepare for independence (Chor, Petras, & Perez, 2018). According to a recent study by Chor and colleagues (2018), the majority of EA planning for a transition out of foster care received an independent living assessment and academic support before turning 18, but were not high or limited service users. Child welfare involvement can support EA service utilization through coordination of care by staff and exposure to additional programmatic supports, which can help EA navigate changes in their providers and policies as they transition to a new system (Hurlburt et al., 2004).

Despite the promise of system supports during the transition out of foster care, findings from the literature are mixed. For example, some studies show a decline in services for EA exiting foster care (Courtney, Terao, & Bost, 2004; McMillen & Raghavan, 2009) and child welfare involved youth (Ringeisen et al., 2009). In contrast, with the high service user profile as the reference group, Chor and colleagues (2018) found that EA in the foster care system and/or receiving foster care services had lower odds of being in a limited service user profile; however, states that served foster youth over age 18 had greater odds of EA being in the limited service user profile, and EA over age 18 also had greater odds of being in this category. Males over age 18 and African American females had greater odds of being in the limited service user profile. Though substantial research has focused on system involved EA

(e.g., transitioning out of foster care), there has been less focus on the predictors of service utilization for EA involved in other systems, such as Medicaid (Pullman et al., 2010).

In addition to demographic characteristics and system involvement, other factors, like diagnostic categories, can predict EA service utilization. Having a SUD may be one such factor, as rates increase between late adolescence and EA and decrease towards the end of EA (Chassin, Colder, Hussong, & Sher, 2016; Chassin, Flora, & King, 2004; Delucchi, Matzger, & Weisner, 2008). Despite this developmental trajectory, there is little research investigating whether a SUD diagnosis predicts EA behavioral health service utilization. In one recent study examining the correlates of mental health service use in emerging adulthood, diagnosis with a SUD was positively related to service utilization; specifically, inpatient services and management of psychotropic medications (Miller et al., 2016). More research is needed to determine the role of SUD in the service utilization of EA.

Another diagnostic factor that can predict behavioral health service utilization in EA is the co-occurrence of mental health and SUD. The co-occurrence of mental health conditions and SUD is concentrated in the EA period when compared to other developmental periods. Specifically, 36% of all adults with co-occurring mental health conditions and SUD are ages 18-25 years, whereas only 20% of adults with mental health conditions but no SUD fall in the EA range (SAMHSA, 2003). These statistics highlight a need for understanding the service utilization of EA with co-occurring mental health and SUD problems, as the frequency is high during EA compared to other developmental stages.

Despite this high co-occurrence, little is known about the service utilization of EA with both a mental health diagnosis and SUD. In the adult literature, co-occurring conditions are linked to higher service utilization. Wu, Kouzis, and Leaf (1999) discovered that co-occurring psychiatric or alcohol disorders were stronger predictors of service utilization than only a psychiatric or alcohol disorder. However, it is unknown whether this holds true for EA. Further, though individuals with co-occurring behavioral health disorders are more likely to access services, treatment outcomes are worse for them (Havassy, Shropshire, & Quigley, 2000; McCarthy, Tomlinson, Anderson, Marlatt, & Brown, 2005).

Co-occurring substance use and psychiatric disorders have been linked to significant impairment in adults; they are associated with more functional impairment than either disorder alone (Vida et al., 2009) and are more difficult to treat. For example, in a study of young adults followed until age 25, those presenting with co-occurring psychiatric and SUD during adolescence had more difficulties in multiple life domains as EA (e.g., high school non-completion, early parenthood) compared to those with single diagnoses (Vida et al., 2009). More work is needed to understand whether EA with co-occurring mental health and SUDs utilize services differently than other age groups.

Purpose of the Current Study

Although strides have been made in identifying the predictors of service utilization for the broader EA population, there is much room for growth in understanding the predictors of the behavioral health service utilization of Medicaid enrolled EA (Pottick et al., 2014). It is pertinent to study EA as a heterogeneous group, so that predictors can be identified to guide

targeted support to prevent service drop out during the critical period between 17 and 18 years of age. To address the gaps in the literature surrounding Medicaid enrolled EA and their service utilization, and to help inform systems interventions for EA, the current study aims to identify the variables at age 17 that are linked to behavioral health service utilization of continuously Medicaid enrolled EA at age 18. Since this population has been understudied, the research questions are exploratory: what variables at age 17 predict the behavioral health service utilization of continuously Medicaid enrolled EA at age 18? Specifically, are 1) gender, 2) race/ethnicity, 3) Department of Children and Families (DCF) involvement, and 4) diagnosis with co-occurring behavioral health disorders or 5) SUD only predictors of behavioral health service utilization at age 18? The second research question relates to the potentially unique role SUD may play in the service utilization of EA: do EA with co-occurring behavioral health disorders or standalone SUDs at age 17 utilize behavioral health services differently at age 18 than those diagnosed with one or more mental health disorders at 17?

Methods

Context

In 1997, a New England state with a relatively large Medicaid population began to proactively address the needs of youth involved with the child welfare system that were “aging out.” A significant system support was created, the Young Adult Services (YAS) program, by the State’s lead mental health authority to assist with EA behavioral health service needs as they transitioned to the adult service system. YAS uses a comprehensive model incorporating clinical, residential, case management, and other support services (Styron et al., 2006). The supports focus on fostering social skills, pro-social behavior, educational success/vocational readiness, and independent living skills. (Styron et al., 2006). An independent evaluation of YAS found that it had a significant impact in meeting the needs of EA transitioning to the adult system (Styron et al., 2006). In 2005, this state was identified as a leader within the U.S. for having a well-established interagency cooperative agreement between the integrated child welfare agency and the lead mental health authority that focused on the identification and transfer of youth from the child/adolescent to the adult behavioral health system (Davis & Sondheimer, 2005).

Data Sources

The population was drawn from Medicaid recipients in a New England state with a relatively large Medicaid population. Demographic, service utilization, and diagnostic information was extracted and analyzed as part of a performance improvement initiative administered by a Medicaid behavioral health administrative services organization. Data from Medicaid claims, authorization, eligibility and enrollment were utilized in the current study.

Inclusion and Exclusion Criteria

The initial data pull included all Medicaid enrolled EA who turned 18 between January 1, 2013 and December 31, 2014. Each EA had a unique measurement period given the time frame is based upon birthday (i.e., index year). Dually enrolled members (i.e., enrolled in both Medicare and Medicaid) were excluded due to the absence of Medicare data. EA in

limited benefit groups at any point during either year, and EA with zero days of Medicaid eligibility for both years, were also excluded. A total of 35,762 EA met these initial criteria.

Next, youth that were not continuously Medicaid enrolled were excluded, bringing the total sample to 15,461. Continuously Medicaid enrolled means EA were eligible and enrolled for 365 days in both their 17th and 18th years of age. It was an inclusion criterion because it guaranteed that the EA had the opportunity to seek services during the entire study time frame, therefore increasing the likelihood of obtaining true utilization rates. EA that did not have a behavioral health diagnosis on a paid claim during their 17th year were excluded in order to focus on EA where a behavioral health need was indicated and therefore may have needed transitional support. Lastly, having discrete categories of mental health and substance use disorders were important for comparison in the analyses due to the hypotheses and research questions. Due to this need, EA diagnosed with developmental or intellectual disabilities, autism spectrum disorder, dementias/cognitive disorders, medication induced disorders, mental disorders due to known physiologic conditions, and other conditions that may be the focus of clinical attention in their 17th year were excluded. The first three diagnostic categories were excluded because they likely included some component of intellectual disability and long-term treatment, which was not a focus of the current work. The last three were excluded because individuals could have received these diagnostic labels due to a substance use or mental health concern, and the data did not provide enough information to differentiate. After the final exclusion, the sample size for the current work was 4,548.

Sample

Of the total sample, 49.71% of EA identified as White, 28.74% as Hispanic, and 15.94% identified as Black. There were more females (52.88%) and non-child welfare involved (80.69%) EA. At age 17, 3,481 (76.3%) EA had at least one mental health diagnosis and no substance use disorder diagnosis, 805 (17.7%) had at least one mental health and at least one substance use disorder diagnosis, and 272 (6%) had at least one substance use disorder diagnosis and zero mental health diagnoses. The full descriptive information can be found in Table 1.

Measures

Child welfare involvement.—EA identified as child welfare involved included any EA who was involved with child welfare through any of its mandates. This included youth committed to DCF through child welfare or juvenile justice, and those dually committed. It also included youth for whom the Department had no legal authority, but for whom DCF provided assistance through its Voluntary Services, Family with Service Needs and In-Home Child Welfare programs. At age 17, 19% of the sample were involved with child welfare. These EA were able to access DCF services outside of Medicaid.

Diagnosis.—Each EA had the potential of receiving multiple behavioral health diagnoses during the measurement period from claims data. Emerging adults' behavioral health diagnostic information was grouped into one of three categories for comparison in analyses: mental health (MH) only, mental health + substance use disorder (MH + SUD), and

substance use disorder (SUD) only. Emerging adults were placed in the MH only category if they had at least one or more MH disorders and no SUDs. Emerging adults were categorized as MH + SUD if they received at least one MH diagnosis and at least one SUD diagnosis on any paid claim (i.e., does not need to be on the same claim). They were placed in the SUD only category if they were diagnosed with at least one SUD and no MH disorders.

Service Utilization.

The levels of care and service types can be found in Table 2. Decision rules were created about service access. An EA was identified as having accessed a service when the number of days/visits/hours was greater than zero.

Data Analysis

SAS Enterprise Guide Version 7.1 (SAS Enterprise Guide, Inc. 2017) was used for all analyses. An alpha of .05 based on the one-tail test was used for significance testing. All predictor variables were obtained from administrative data from EA's 17th year. There was missing data on the predictor variables gender and race/ethnicity for 130 participants; specifically, the data was listed in the system as "unknown". The data from those EA were dropped from the analyses. The service utilization outcome variable was obtained from administrative data from EA's 18th year. The dependent variable for service utilization was coded (0,1). There was no missing data on the dependent variable. Only EA with behavioral health diagnoses were included in the analyses. Their diagnosis came from a service visit. All EA in the sample utilized services in their 17th year. If they did not have a service visit in their 18th year, then they were given the service utilization code of zero.

Logistic regression analyses using a forward entry process were used to understand the factors at age seventeen that predicted the likelihood of EA service utilization at age eighteen. Forward entry was utilized because the analyses were exploratory; there were not specific hypotheses about the predictors since this was an understudied population. This specific age range was also important for continuous quality improvement purposes for the administrative service organization. Gender, race/ethnicity, child welfare status, diagnostic grouping (i.e., MH only, MH + SUD, SUD only), and the interaction between child welfare status and diagnostic grouping were used as predictors. All predictors were dummy coded (0,1). The MH only diagnostic grouping served as the reference group for comparisons with the MH + SUD and SUD only groupings.

In forward entry, the software program examines the predictor variables and chooses the strongest predictor first, and adds that variable to the model. This process is repeated until additional predictors do not add unique information. Once the model building was complete, the Hosmer and Lemeshow Goodness of Fit test was used to determine if the model was correctly specified/calibrated. The concordance statistic was then used to determine the discrimination or predictive ability of the model. The concordance statistic ranges from 1, perfect discrimination, to .5, no discrimination ability. A model with high discrimination ability will have both high sensitivity and specificity simultaneously and a value close to one. This statistic is illustrated by the receiving operator characteristic (ROC) curve, in which the true positive rate is plotted against the false positive rate. Odds ratios (ORs)

associated with the regression coefficients [i.e., $OR = \exp(b)$] were reported to aid in interpretation.

Results

We used Chen, Cohen and Chen's (2010) method for calculating effect sizes from OR s: small = 1.52 OR , medium = 2.74 OR , and large = 4.72 and small = .66 OR , medium = .36 OR , and large = .21 OR respectively. The exploratory forward entry model building process retained the race/ethnicity, child welfare status, MH + SUD, and the SUD only variables to produce a model that provided the best fit to the data ($\chi^2_{(4)} = 203.90$, $p < 0.001$), and accounted for significant variation in the dependent variable (Cox & Snell $R^2 = 0.07$). The gender and interaction terms were dropped from the model. The Hosmer and Lemeshow Goodness of Fit test was non-significant; the data fit the model adequately ($\chi^2_{(4)} = 3.06$, $p = .55$). The association between the predicted and observed values in the model, the concordance statistic, was .62. Related to the ROC curve, a model with high discrimination ability would have a curve that reaches up into the upper left quadrant. A model with no predictive ability would have a curve that aligned with the line. Based on the ROC curve, the model predicts/discriminates modestly.

After controlling for other variables, belonging to a minority group was associated with reduced odds (i.e., 24% lower) of utilizing behavioral health services at 18 (odds ratio [OR], .76, 95% confidence interval [CI], .67 to .86, $p < .001$) when compared to EA who identified as White. EA involved with child welfare during their 17th year had two times more odds of utilizing services at age 18 than EA that were not child welfare involved (OR, 2.08, 95% CI, 1.76 to 2.47, $p < .001$). This effect was medium. Emerging adults in the MH + SUD group at age 17 had increased odds of utilizing behavioral health services at age 18 (OR, 1.47, 95% CI, 1.24 to 1.74, $p < .001$; small effect) when compared to EA in the MH only group; they were 47% higher than the odds for EA in the MH only group. In contrast, EA in the SUD only group had lower odds (i.e., 72% lower) of utilizing behavioral health services at age 18 (OR, .28, 95% CI, .21 to .37, $p < .001$) when compared to EA in the MH only group, this was a large effect. Gender and the interaction of child welfare and diagnostic categories were not significantly related to behavioral health service utilization at age 18 after taking into account other variables. See Table 3 for the parameter estimates of the best fitting model.

Discussion

The current work addressed gaps in the literature regarding predictors of service utilization of continuously Medicaid enrolled EA and also examined if there were any differences in utilization for EA with and without a SUD diagnosis in their 17th year. Minority EA had lower odds of utilizing services at age 18. Child welfare involved EA had greater odds of utilizing services at age 18; child welfare involvement was protective against treatment drop out for Medicaid enrolled EA. EA with a SUD diagnosis at 17 utilized services at age 18 differently than those without a SUD. EA with co-occurring behavioral health problems at age 17 had a higher likelihood of service utilization at age 18—the opposite was true for EA with only a SUD diagnosis.

Racial disparities in service utilization

In the current study, minority EA had lower odds of utilizing services at age 18 than White EA, a disparity that aligns with the broader literature (Garland et al., 2005; Miller et al., 2016; Pottick et al., 2014) and that must be addressed. Prior work has shown there are several reasons that could explain the differences in utilization including: few non-English language services, lack of service options in remote areas, culture specific stigma around service receipt, cultural differences on the purpose of health care services, fragmented and high cost services, comorbidity of mental health concerns and chronic diseases, and incarceration (Primm et al., 2010). Ongoing work is needed to reform service systems so they can better serve EA from minority groups.

The protective role of child welfare involvement

Child welfare systems have long been considered to be important gateways to supportive services for individuals exhibiting behavioral health concerns (Hurlburt et al., 2004); however, EA in foster care and service providers have reported feeling uninformed about behavioral health and service options (Havlicek, McMillen, Fedoravicius, McNelly, & Robinson, 2012; Narendorf, Fedoravicius, McMillen, McNelly, & Robinson, 2012). In the current sample, child welfare involved EA had higher odds of utilizing services at 18 than those uninvolved. The current findings contrast with those of service system involved EA in the broader literature (Chor et al., 2018). Those studies, however, have solely focused on EA transitioning out of foster care, while this sample contains EA involved with child welfare for a variety of reasons and for any of its mandates. For example, two studies reported that foster care enrolled EAs' service utilization declined from age 17 to 19 (Courtney et al., 2004; McMillen & Raghavan, 2009), which is a decrease that mirrors service disengagement in the general population. In a sample of EA that were involved with child welfare due to parental abuse or neglect, mental health service use also declined significantly from baseline (47.6%; 12-15 years old) to 14.3 % at a five to six year follow up (Ringeisen et al., 2009). The current findings highlight that general child welfare involvement may be protective for specific subsets of EA. All child welfare systems are not equally resourced or equally effective, however. Thus, an explanation for the differential findings could be due to the availability, intensity, and quality of the case management services that this sample experienced. More work is needed to untangle whether the engagement is due to having more severe problems that lead these EA to be identified and referred to services at higher rates, or if it is because of having access to child welfare workers that connect them to services more readily.

Links between diagnoses and service utilization

EA with only SUD diagnoses in this sample had lower odds of accessing services at age 18 when compared to EA with only mental health diagnoses. One reason for this utilization difference could be that substance use during EA is viewed as normative developmentally; many EA use substances during this time period, but then do not go on to have later problems (Chassin, et al., 2016; Chassin et al., 2004). However, there is certainly a subset of EA that will go on to develop problems, and it is concerning that they may not be accessing the services they need.

EA with co-occurring behavioral health problems had greater odds of utilizing services in this sample than EA with only mental health diagnoses. The finding aligns with the broader literature: the co-occurrence of psychiatric and SUD diagnoses have been linked to an increased likelihood of service utilization (Wu et al., 1999). The higher odds of behavioral health utilization for EA with co-occurring behavioral health diagnoses is likely due to their greater need for services due to the combination of disorders leading to more serious behavioral health concerns or greater impairment in functioning (Havassy et al., 2000; McCarthy et al., 2005; Wu et al., 1999). Aligning with this hypothesis, the EA in the current sample with co-occurring behavioral health disorders had a higher number of overall diagnoses when compared to EA with only mental health or only SUDs. It is promising that EA with potentially greater need are utilizing services; however, in both adolescent and adult studies, treatment outcomes tend to be worse for individuals with co-occurring problems (Havassy et al., 2000; McCarthy et al., 2005).

Strengths and Limitations

The current study has many strengths. It focused on EA, a difficult to study population, and it followed them over the developmentally critical time period—between their 17th and 18th year. Typically, it is difficult to follow EA into adulthood due to incompatibility in child and adult service data management systems. The current work also explored behavioral health service utilization in a more nuanced way than has previously been conducted in the literature by comparing EA with SUD diagnoses to EA without them. The current work also examined a large sample of youth using administrative data rather than self-report data, which may be a more accurate account of their service utilization. The ability to utilize administrative data allowed for access to the data of all Medicaid enrolled EA that received services during the study time period.

There are some limitations of the current work. Although it was advantageous to have a longitudinal dataset, the time frame was restricted on administrative data, which only allowed for analyses of EA at ages 17 and 18. Future work could expand and follow this cohort over time. Another limitation is that, though it is a strength that the state is a leader in having a well-established interagency cooperative agreement focused on the transfer of youth from the child/adolescent to the adult behavioral health system, the results of this study may be less likely to generalize to states in which there is not a well-established connection, and may overestimate service utilization in those instances.

The current study examined readily available administrative data. There are other non-traditional or non-Medicaid service options for EA that were not captured in these data. For example, the DCF involved EA had access to services covered by State Government/DCF that are non-Medicaid billable. Further, all EA had the opportunity to access services outside of Medicaid. In these analyses, only accessing services outside of Medicaid would be represented by zero service utilization, which is a limitation of this work. Also, only continuously Medicaid enrolled EA were included in the analyses, so the findings do not capture the service utilization patterns of all EA who accessed services during their 17th year. This stringent exclusion criteria limited the generalizability of the study's findings.

Future work could focus on understanding predictors of service utilization at varying levels of Medicaid eligibility and enrollment to enhance generalizability.

An additional limitation is that predictors of service utilization were explored using only logistic regression. Given advances in predictive modeling, it will be fruitful to explore other types of models that take into account non-linear data, such as random forests or gradient boosting machines. Further, the model predicted service utilization only modestly well. The study was limited by the data that were available. There are likely other predictor variables that would make the model stronger that were not available due to the nature of the data. As one example, school enrollment has been found to predict service utilization for EAs (Miller et al., 2016), and we did not have access to additional demographic variables in this dataset. Additional variables of importance to service utilization are employment status, living situation (with caregivers versus independent), and symptom severity, which we did not have in this dataset. Also, the dependent variable was not broken down by service type (i.e., inpatient, outpatient, medication management), and other studies of EA service utilization have found different predictors depending on the service type (Miller et al., 2016). Future studies could differentiate the type, dosage, or duration of services, which would provide a more nuanced picture of service utilization.

Finally, there was a smaller sample size of EA with only a SUD, and the majority of substances used were alcohol, nicotine, and marijuana. Since the SUD diagnoses were only those that were captured by the administrative data, SUD diagnoses may have been under-reported. Practitioners are often hesitant about providing a SUD to EA due to the stigma and lack of services for this age group, so the SUD diagnoses that were given may have also been more severe cases.

Implications and Future Directions

Overall, the current findings indicated differences in service utilization for subsets of EA as they move through a critical time period (i.e., 17 to 18 years of age) in the behavioral health service system. For example, EA with SUD diagnoses had lower odds of utilizing services at age 18 than those without a SUD diagnosis, and minority EA had lower odds of utilizing services when compared to White EA. These utilization disparities may indicate unmet, unique service needs, such as developmental/cultural fit, and access barriers, such as transportation and knowledge about services. To begin to address these needs, systematic identification, referral, and developmentally appropriate treatment, beginning in adolescence, is critical. Currently, child/adolescent medical providers rarely screen for SUD, and when they do, they are often unaware of treatment referral options. Additionally, systems interventions need to be developed to aid in the transition of EA from the child/adolescent to adult service systems.

One way to intervene in systems to promote continued service utilization is to conduct outreach efforts to youth at risk of drop out. Studies from the adult and adolescent literature have shown that the use of outreach specialists improves service utilization and outcomes (Chinman et al., 2015; Naar-King, Outlaw, Green-Jones, Wright, & Parsons, 2009; Walker & Bryant, 2013). Once the need is understood, providers could conduct targeted transition referrals for specific, client identified needs, and this individualization may improve

retention when compared to a transfer to general services. In order to bring these ideas to fruition, at the data management level, it is necessary to work with service systems to develop capacities to better study this age range. Whether the capacity is shared data management systems between the child and adult service systems, or an outside organization managing the longitudinal data, supports are necessary to understand facilitators and barriers to service utilization during emerging adulthood.

Though this study highlighted some service utilization differences, it also uncovered support strengths. EA with co-occurring behavioral health diagnoses had higher odds of accessing services than EA with only mental health diagnoses, and child welfare involved EA had higher odds of accessing services than those uninvolved with child welfare. Though unable to be determined by the current work, it is likely that the higher access is due to higher service needs and symptom severity among these populations. Related specifically to EA involved with child welfare, the higher odds of service use could be related to having access to Medicaid services until age 21. More research is needed to understand the factors driving their higher service use, and whether increased use also means that they are receiving the services that are best for co-occurring conditions and child welfare related transition needs. Learning from Medicaid enrolled EA about their service needs and involving them in creating a systems intervention via the use of participatory methodology may be a fruitful way to gain perspective and tailor services. Just because EA involved in child welfare are utilizing services, does not mean that the services are in alignment with their unique needs or of quality. The use of participatory strategies with EA transitioning out of foster care via youth advisory boards/councils (Forenza & Happonen, 2016) can help determine if available services are meeting their unique needs and challenges. Studies have also involved consumers of behavioral health services in service system change and evaluation (Case et al., 2014). Involving EA involved in foster care in evaluation of their transition services would also be a fruitful avenue to explore.

The literature has long highlighted that services for EA transitioning from the child to the adult behavioral health system are lacking in amount and ability to meet the unique needs of this age group (Davis & Sondheimer, 2005). For example, in an analysis of transition support services in states across the country, only two (i.e., Nebraska, Vermont) provided comprehensive transition support services, and only one's service was statewide (Davis & Sondheimer, 2005). Within systems of care, though the majority of enrolled youth ages 17-18 received some form of transition services, fewer than 10% of EA aged 16-17 received them (Davis & Sondheimer, 2005). Providing transition support only in the year before adolescents turn 18 is too late. Despite these decade old concerns, there has been little progress in improving transition support services, as a recent review of the literature found that high quality transitional care is lacking (Paul et al., 2015). The policy to practice gap must be improved to help EA with behavioral health needs utilize the services that they need so they can thrive throughout adulthood.

Policy changes related to behavioral health services can positively impact EA. Efforts for child welfare involved youth have more recently focused on housing and job supports. In the current study, child welfare involved EA had higher odds of utilizing behavioral health services than EA uninvolved in child welfare, which to some may indicate that the need is

met in this domain. However, utilization does not necessarily mean high quality, met needs, or equity in service receipt. Additional evaluation and feedback specifically including EA in the process is necessary to determine whether a focus on improving behavioral health services for this group is needed. Overall, systems level and policy changes are pertinent to address disparities in utilization of transition support and behavioral health services. Perhaps, if behavioral health services meet adolescent developmental needs by beginning transition support in early adolescence, and provide services that meet the unique needs of adolescents with SUD diagnoses and those identifying with minority groups, EA may be more likely to commit to transitioning to a new system.

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References

- Beiser M, Erickson D, Fleming UF, et al. (1993). Establishing the onset of psychotic illness. *American Journal of Psychiatry*, 150, 1349–1354. [PubMed: 8352345]
- Case AD, Byrd R, Claggett E, DeVeaux S, Perkins R, Huang C, ... & Bailey M (2014). Stakeholders' perspectives on community-based participatory research to enhance mental health services. *American journal of community psychology*, 54, 397–408. [PubMed: 25245601]
- Chassin L, Colder CR, Hussong A, & Sher KJ (2016). Substance use and substance use disorders. *Developmental Psychopathology*, 1–65.
- Chassin L, Flora DB, & King KM (2004). Trajectories of alcohol and drug use and dependence from adolescence to adulthood: The effects of familial alcoholism and personality. *Journal of Abnormal Psychology*, 113, 483–498. [PubMed: 15535782]
- Chen H, Cohen P, & Chen S (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics—Simulation and Computation*, 39, 860–864.
- Chinman M, Oberman RS, Hanusa BH, Cohen AN, Salyers MP, Twamley EW, & Young AS (2015). A cluster randomized trial of adding peer specialists to intensive case management teams in the Veterans Health Administration. *The journal of behavioral health services & research*, 42(1), 109–121. [PubMed: 23657754]
- Chor KHB, Petras H, & Pérez AG (2018). Youth subgroups who receive John F. Chafee Foster Care Independence Program services. *Journal of Child and Family Studies*, 27(5), 1402–1414.
- Clark H, Deschenes N, & Jones JA (2000). Framework for the development and operation of a transition system In Clark HB & Davis M (Eds.), *Transition to adulthood: A resource for assisting young people with emotional or behavioral difficulties* (pp.29–51). Baltimore, Md: Paul H. Brooks Co.
- Clark H, Unger K, & Stewart V (1993). Transition of youth and young adults with emotional and behavioral disorders into employment, education and independent living. *Community Alternatives International Journal of Family Care*, 5, 21–46.
- Courtney ME, Terao S, & Bost N (2004). *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.
- Davis M, Banks S, Fisher W, et al. (2004). Longitudinal patterns of offending during the transition to adulthood in youth from the mental health system. *Journal of Behavioral Health Services and Research*, 31, 351–366. [PubMed: 15602138]

- Davis M, & Sondheimer DL (2005). State child mental health efforts to support youth in transition to adulthood. *The journal of behavioral health services & research*, 32, 27–42. [PubMed: 15632796]
- Davis M, & Vander Stoep A (1997). The transition to adulthood for youth who have serious emotional disturbance: Developmental transition and young adult outcomes. *Journal of Mental Health Administration*, 24, 400–427. [PubMed: 9364110]
- Delucchi KL, Matzger H, & Weisner C (2008). Alcohol in emerging adulthood: 7-year study of problem and dependent drinkers. *Addictive Behaviors*, 33, 134–142. [PubMed: 17537582]
- Federico SG, Steiner JF, Beaty B, Crane L, & Kempe A (2007). Disruptions in insurance coverage: Patterns and relationship to health care access, unmet need, and utilization before enrollment in the State Children's Health Insurance Program. *Pediatrics*, 120, e1009–e1016. [PubMed: 17908722]
- Forenza B, & Happonen RG (2016, 2). A critical analysis of foster youth advisory boards in the United States In *Child & Youth Care Forum* (Vol. 45, No. 1, pp. 107–121). Springer US.
- Garland AF, Lau AS, Yeh M, McCabe KM, Hough RL, & Landsverk JA (2005). Racial and ethnic differences in utilization of mental health services among high-risk youths. *American Journal of Psychiatry*, 162, 1336–1343. [PubMed: 15994717]
- Havassy BE, Shropshire MS, & Quigley LA (2000). Effects of substance dependence on outcomes of patients in a randomized trial of two case management models. *Psychiatric Services*, 51, 639–644. [PubMed: 10783183]
- Havlicek J, McMillen JC, Fedoravicius N, McNelly D, & Robinson D (2012). Conceptualizing the step-down for foster youth approaching adulthood: Perceptions of service providers, caseworkers, and foster parents. *Children and youth services review*, 34, 2327–2336. [PubMed: 23878410]
- Hurlburt MS, Leslie LK, Landsverk J, Barth RP, Burns BJ, Gibbons RD, ... & Zhang J (2004). Contextual predictors of mental health service use among children open to child welfare. *Archives of general psychiatry*, 61, 1217–1224. [PubMed: 15583113]
- Karlin BE, Duffy M, & Gleaves DH (2008). Patterns and predictors of mental health service use and mental illness among older and younger adults in the United States. *Psychological Services*, 5(3), 275.
- McCarthy DM, Tomlinson KL, Anderson KG, Marlatt GA, & Brown SA (2005). Relapse in alcohol- and drug-disordered adolescents with comorbid psychopathology: Changes in psychiatric symptoms. *Psychology of Addictive Behaviors*, 19, 28–34. [PubMed: 15783275]
- McMillen JC, & Raghavan R (2009). Pediatric to adult mental health service use of young people leaving the foster care system. *Journal of Adolescent Health*, 44, 7–13. [PubMed: 19101453]
- Merikangas KR, He JP, Burstein M, et al. (2011). Service utilization for lifetime mental disorders in US adolescents: results of the National Comorbidity Survey–Adolescent Supplement (NCSA). *Journal of the American Academy of Child & Adolescent Psychiatry*, 50, 32–45. [PubMed: 21156268]
- Miller S, Ringeisen H, Munoz B, Hedden SL, Colpe LJ, Rohloff H, & Embry V (2016). Correlates of mental health service use among young adults with mental illness: Results from the national survey on drug use and health. *Psychiatric Services*, 67, 642–649. [PubMed: 27079984]
- Naar-King S, Outlaw A, Green-Jones M, Wright K, & Parsons JT (2009). Motivational interviewing by peer outreach workers: a pilot randomized clinical trial to retain adolescents and young adults in HIV care. *AIDS care*, 21, 868–873. [PubMed: 20024744]
- Narendorf SC, Fedoravicius N, McMillen JC, McNelly D, & Robinson DR (2012). Stepping down and stepping in: Youth's perspectives on making the transition from residential treatment to treatment foster care. *Children and youth services review*, 34, 43–49. [PubMed: 22247580]
- Paul M, Street C, Wheeler N, & Singh SP (2015). Transition to adult services for young people with mental health needs: A systematic review. *Clinical child psychology and psychiatry*, 20, 436–457. [PubMed: 24711585]
- Pottick KJ, Warner LA, Vander Stoep A, et al. (2014). Clinical characteristics and outpatient mental health service use of transition-age youth in the USA. *The Journal of Behavioral Health Services & Research*, 41, 230–243. [PubMed: 24198086]
- Primm AB, Vasquez MJ, Mays RA, Sammons-Posey D, McKnight-Eily LR, Presley-Cantrell LR, ... & Perry GS (2010). The role of public health in addressing racial and ethnic disparities in mental health and mental illness. *Preventing chronic disease*, 7, 1–7.

- Pullman MD, Heflinger CA, & Mayberry LS (2010). Patterns of Medicaid disenrollment for youth with mental health problems. *Medical Care Research and Review*, 67, 657–675. [PubMed: 20555015]
- Rhodes AE, Goering PN, To T, & Williams JI (2002). Gender and outpatient mental health service use. *Social Science & Medicine*, 54, 1–10. [PubMed: 11820673]
- Ringeisen H, Casanueva CE, Urato M, & Stambaugh LF (2009). Mental health service use during the transition to adulthood for adolescents reported to the child welfare system. *Psychiatric Services*, 60, 1084–1091. [PubMed: 19648196]
- Singh S (2009). Transition of care from child to adult mental health services: The great divide. *Current Opinion in Psychiatry*, 22, 386–390. [PubMed: 19417667]
- Styron TH, O'Connell M, Smalley W, Rau D, Shahar G, Sells D, ... & Davidson L (2006). Troubled youth in transition: An evaluation of Connecticut's special services for individuals aging out of adolescent mental health programs. *Children and Youth Services Review*, 28, 1088–1101.
- Substance Abuse and Mental Health Services Administration. (2003). Overview of Findings from the 2002 National Survey on Drug Use and Health (Office of Applied Studies, NHSDA Series H-21, DHHS Publication No. SMA 03–3774). Rockville, MD.
- Vida R, Brownlie EB, Beitchman JH, Adlaf EM, Atkinson L, Escobar M, et al. (2009). Emerging adult outcomes of adolescent psychiatric and substance use disorders. *Addictive Behaviors*, 34, 800–805. [PubMed: 19398165]
- Walker G, & Bryant W (2013). Peer support in adult mental health services: A metasynthesis of qualitative findings. *Psychiatric Rehabilitation Journal*, 36, 28. [PubMed: 23477647]
- Wu LT, Kouzis AC, & Leaf PJ (1999). Influence of comorbid alcohol and psychiatric disorders on utilization of mental health services in the National Comorbidity Survey. *American Journal of Psychiatry*, 156, 1230–1236. [PubMed: 10450265]

Highlights

- Medicaid enrolled emerging adults with co-morbid diagnoses of at least one mental health disorder and one substance use disorder at age 17 had greater odds of utilizing behavioral health services at age 18 than emerging adults with mental health disorders alone at 17.
- Medicaid enrolled emerging adults with only a substance use disorder diagnosis at age 17 had lower odds of utilizing behavioral health services at age 18 than emerging adults with mental health disorders alone at 17.
- Emerging adults from minority groups who were enrolled in Medicaid at age 17 were less likely to utilize behavioral health services at age 18 than White emerging adults.
- Emerging adults involved with child welfare at age 17 had greater odds of utilizing behavioral health services at age 18 when compared to emerging adults uninvolved with child welfare at age 17.

Figure 1.
Flowchart of inclusion and exclusion criteria.

Figure 2.
ROC curve illustrating the discrimination ability of the predictive model.

Table 1.

Demographics of the study sample.

	N=4548	%
Gender		
Male	2143	47.12
Female	2405	52.88
Race/Ethnicity		
African American	725	15.94
Hispanic	1307	28.74
Caucasian	2261	49.71
Asian	50	1.10
Multi-Racial	63	1.39
Native American	6	.13
Unknown	136	2.99
Child Welfare Involvement		
Involved	878	19.31
Not Involved	3670	80.69
Diagnostic Groupings		
MH Only	3481	76.30
SUD Only	272	6.00
MH + SUD	805	17.70

Note. MH = mental health; SUD = Substance Use Disorder

Table 2.

Level of care and services that emerging adults used at age 17.

Inpatient	Inpatient Psychiatric Hospital Inpatient Psychiatric Hospital-State Psychiatric Residential Treatment Facility (PRTF)
Emergency Department	Emergency Department Visits-Behavioral
Congregate Care	Residential Treatment Center (RTC) Group Home
Intensive Outpatient	Intensive Outpatient (IOP) Partial Hospitalization Program (PHP)
Home-Based Services	Home-Based Services Other Home-Based Services
Routine Behavioral Health	General Behavioral Health Individual Therapy Family Therapy Group Therapy Psychiatric Testing Other Behavioral Health-Medication Management

Table 3.

Significant predictors at age 17 of emerging adult service utilization at age 18.

Parameter	Estimate	Standard Error	Wald Chi-Square	Odds Ratios
Intercept	.39	.05	66.63 [*]	
SUD only	−1.28	.14	82.58 [*]	.28
DCF	.73	.09	71.34 [*]	2.08
MH + SUD	.38	.09	19.21 [*]	1.47
Race	−.28	.06	19.20 [*]	.76

Note.

*
 $p < .0001$