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The Impact of Healthcare Education on Utilization among Adolescents preparing for Emancipation from Foster Care

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Abstract

PURPOSE: As teens in foster care prepare for emancipation, healthcare navigation is often overlooked as caseworkers address other social needs. This study examined the impact of healthcare education materials designed for foster youth, called ICare2CHECK. It was hypothesized that ICare2CHECK would increase non-urgent ambulatory healthcare use and decrease emergency/urgent care use.

METHODS: Adolescents (N = 151; ages 16-22 years) were enrolled into ICare2CHECK and received health education materials at their baseline study visit. Surveys were repeated every three months to assess healthcare utilization. After 12 months of enrollment, healthcare data for all eligible youth and matched comparison youth (N=151) over the previous 24 months was extracted from the electronic health record (EHR; N = 302). EHR data was coded as counts of completed non-urgent ambulatory care encounters (i.e., primary and preventative care, specialty care), completed urgent or emergency encounters (i.e., urgent and emergency department visits, hospitalizations), completed foster care clinic visits, and total completed visits.

Results: Healthcare use significantly decreased over time for both enrolled and comparison youth. Females, youth engaging in health risk behaviors, and those with a mental health or chronic condition diagnosis used significantly more healthcare. Receipt of educational materials, was associated with a smaller decline in healthcare use and non-urgent ambulatory care use, controlling for covariates. Self-reported use of educational materials was associated with increased utilization in the enrolled condition.

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CONCLUSIONS: Results suggest that ICare2CHECK is associated with increased engagement in healthcare generally, and non-urgent ambulatory care specifically (e.g., outpatient primary and specialty care).

Keywords

adolescent; foster care; health education; emancipation; healthcare utilization

INTRODUCTION

Young people emancipating from foster care face multiple health obstacles as adults. They experience higher rates of substance use, sexually transmitted infections, unintended pregnancy, injury, illness, and report disrupted health insurance coverage and poor access to healthcare following emancipation (1–7). Importantly, adolescents involved with child welfare have frequently experienced complex trauma and adversity, a significant predictor of poor health outcomes across the lifespan (8–10). Health concerns persist into early adulthood (2), motivating expanded foster care to age 21 (11) and eligibility for Medicaid until age 26 (12). While this is critical, experts and advocacy organizations have encouraged healthcare and child welfare systems to also develop targeted health education materials for young people emancipating from foster care (13), as it remains unclear whether expanded services and healthcare coverage alone is sufficient to alter young people’s engagement with healthcare systems and self-management of health (4, 14).

Educating young people about their health and navigating healthcare systems independently is important for all youth, in part because the transition from pediatric to adult care can be challenging (15–18). Healthcare transition and self-management education often occurs in the context of primary care, where best practice guidelines recommend that young people have conversations with their parents and primary care providers about accessing healthcare, engaging with health care systems, and managing their health independently (19). For adolescents in foster care there is reason to suspect that planning for the healthcare transition is overlooked (20). These young people do not have parents to assist them with navigating this transition, and the county or state representative acting as the *in loco parentis* typically focuses on other activities of daily living (e.g., budgeting and finance, school, work, transportation). Finally, while all young people in foster care are required to be seen for an annual physical and other healthcare services are recommended (21), research has demonstrated that foster youth frequently change healthcare providers, and are often disconnected from primary care (22, 23). As a result, young people emancipating from foster care may be less likely to experience coordinated transition and transfer to primary care providers (5, 14).

This study sought to investigate whether healthcare education materials developed in conjunction with young people support engagement with healthcare services in preparation for emancipation. It was hypothesized that delivery of high-quality, relevant educational materials would promote engagement with primary and specialty healthcare and would decrease reliance on emergency and urgent care.

METHODS

Participants

Adolescents in child protective services (CPS) custody for at least 12 months who were expected to emancipate due to a combination of age, case plan goal, and/or legal status were recruited to participate. All adolescents were in the custody of a single county child welfare agency that had extended foster care to age 21 years. Adolescents were considered eligible if they were aged 16 years or older, were without a diagnosis of cognitive disability or intelligence quotient (IQ) below 70, were English-speaking, and were residing in a family, group home, or independent living setting within a 1-hour driving distance of the academic medical center where the study was based. Adolescents younger than 16 years old, those with a cognitive disability or IQ below 70, youth who had been in protective custody for fewer than 12 months, and youth placed in inpatient treatment settings, nursing homes, juvenile detention, or who were reunited with family or adopted were considered ineligible to participate. All youth who participated in ICare2CHECK provided assent (if under age 18 years) or consent (if 18 years or older) to participate in the study. Of 436 youth who were determined eligible to participate in ICare2cHECK, 151 were recruited. Of the remaining 285 youth, 151 were matched based on gender, age, and race and ethnicity to serve as a comparison sample.

Procedures

Study staff communicated with CPS, who provided a letter of consent for all eligible participants. CPS provided study staff with a list of eligible youth that included case history, current placement status, and names of stakeholders including guardians ad litem and caseworkers. These individuals were contacted about the youths' eligibility for the study and were given the opportunity to opt youth out of participating. Study staff reviewed child welfare and electronic health records (EHR) to confirm eligibility. Youth who were deemed eligible (N=365) were mailed a letter explaining the study with instructions to opt out of additional contact. Study staff then contacted participants by phone or in person while receiving medical care at the foster care clinic located at Cincinnati Children's Hospital Medical Center (CCHMC). This study was approved and monitored by the Institutional Review Board at CCHMC.

More than half (N=204) of eligible youth were successfully contacted, and 154 provided initial verbal consent (if aged 18 years or older) or assent (if aged 16 or 17 years) to participate. Three participants were lost to enrollment due to changes in placement (n = 2) or incarceration (n = 1). Study staff scheduled in-person visits with youth in their homes or public locations (e.g., community centers, libraries, restaurants). During visits, participants (N=151) provided written informed assent or consent and completed surveys. In-person visits occurred at baseline, six months after baseline, and twelve months after baseline. Participants also completed brief phone surveys three and nine months after baseline. Participants were compensated for their time with a ClinCard valued at \$15 plus a first aid kit and study materials for their first visit, \$20 for the six month follow-up, and \$20 for the twelve month follow-up.

Study staff received electronic health record (EHR) data from CCHMC for enrolled and comparison youth in the year prior to and during study participation. Extracted data included encounter date, encounter type (primary care, specialty care, emergency and urgent care, and hospitalizations), encounter diagnoses, flowsheet data, and laboratory screening results.

Materials

The ICareGuide is an analog tool designed to assist foster youth in navigating the healthcare system and maintaining connections to primary care. Design experts from the Live Well Collaborative engaged with foster youth and stakeholders to design the ICareGuide. Youth selected the format, organization, and styling of the information. The resulting pocket-sized guide included space to record personal health information such as medications, immunization records, and family medical history as well as provided information on accessing healthcare (including primary care doctors, dentists, and eye doctors), sexual and reproductive health, and managing medical emergencies. The guide included a chart listing various symptoms and guidance on appropriate level of health care (e.g., when to seek emergency care), instructions on how to apply for Medicaid, how to prepare for and arrange transportation to medical appointments, and why preventive healthcare is important. Information regarding prevention of pregnancy and sexually transmitted infections as well as emergency hotlines were included. During focus groups, many youth requested information regarding pediatric care for their own children, and this information was added. Youth also rejected a mental health or wellness section, so information on this topic, such as healthy relationships and mental health support hotlines, was spread throughout the guide.

The companion website, www.icare2check.org, was designed to provide information similar to that in the ICareGuide. Additional information not present in the ICareGuide included interactive features such as maps showing healthcare facility locations, a tool to assist youth in deciding what type of medical treatment (e.g., self-treatment, primary care, or emergency services) they need, links to healthcare knowledge games, and the transition readiness assessment questionnaire (24). Information geared toward caregivers of youth in foster care, such as how to talk to youth about sensitive subjects like mental and sexual health, was included on the site.

Measures

EHR data was coded as counts of completed non-urgent encounters (i.e., primary and preventative care, specialty care), missed encounters (i.e., scheduled but not completed or cancelled in less than 24 hours), completed urgent or emergency encounters (i.e., urgent and emergency department visits, hospitalizations), and mandated foster care clinic encounters. Mental health and chronic medical conditions were dichotomously coded from encounter diagnoses. Lifetime substance use (e.g., alcohol, tobacco, marijuana; yes/no) was coded from encounter diagnoses, laboratory results, and flowsheet data. Sexual risk behaviors (e.g., multiple partners, sexual debut before age 14, inconsistent use of barrier protection, diagnosis of sexually transmitted infections, pregnancy; yes/no) was coded from encounter diagnoses, laboratory results, and flowsheets. Demographic characteristics (age at baseline visit, minority status [yes/no], sex [male/female]) were also derived from the EHR.

At follow-up study visits, enrolled youth reported whether they still had their ICareGuide (yes/no) and had used their ICareGuide to complete any of the following tasks (yes/no): make a doctor's appointment, arrange transportation to a medical appointment, make decisions about what type of healthcare to utilize, visit a free clinic, learn about sexual health, and deciding what to do in case of an emergency. At the final study visit, participants reported how helpful they believed the ICareGuide was (Not at all helpful, Not very helpful, Unsure, Somewhat helpful, Very helpful) and whether they planned to use their ICareGuide in the future (yes, no, unsure).

Self-reported healthcare utilization data for enrolled youth were derived from survey results. At baseline, participants reported the number of times they had seen primary care, specialty care, and emergency care providers in the past twelve months. At each subsequent visit, participants reported the number of times they had seen these providers since the previous study visit.

CPS provided number of placement changes, length of time in custody, legal status (planned permanent living arrangement, permanent custody, and temporary custody), and primary removal reason (neglect, physical/emotional/sexual abuse, child behavior problems).

Utilization of www.ICare2CHECK.org was evaluated using Google Analytics to track website traffic, locations of users, and page visits.

RESULTS

Adolescents recruited into ICare2CHECK (N = 151) had a mean age of 18.08 years (SD = 1.36). Youth were African American (70.5%), non-Hispanic white (24.5%), or multi-racial or other racial and ethnic categories (5%); 54% of participants were female. Adolescents were in foster care for 1 to 14 years (M = 2.91, SD = 3.16); most had a legal status of planned permanent living arrangement (71.7%) or permanent custody (12%). Youth entered foster care primarily due to neglect (62%), physical abuse (5%), sexual abuse (3%), emotional abuse (3%), or child behavior problems (27%). The majority of adolescents (61%) participated in all 3 in-person data collection time points; 21% completed only 2 visits, and 17% completed only the baseline study visit. There were no significant differences in demographic characteristics or healthcare utilization between those who completed 2 or more study visits and those who were lost to follow-up (p s > .05). Youth enrolled in ICare2CHECK were slightly younger than comparison youth ($t(300) = 4.06$, $p < .01$), and used more healthcare in the year prior to enrollment ($t(240) = -2.09$, $p = .03$) because of more visits to the foster care clinic ($t(300) = -4.22$, $p < .01$); no differences in emergency and urgent care or non-urgent healthcare were identified (see Table 1). Youth enrolled in ICare2CHECK were also generally more impaired; they were more likely to have a chronic medical condition ($\chi^2(1) = 27.70$, $p < .01$) or mental health diagnosis ($\chi^2(1) = 39.06$, $p < .01$) than comparison youth and were more likely to engage in health risk behaviors ($\chi^2(1) = 9.11$, $p < .01$ and $\chi^2(1) = 7.28$, $p < .01$ for lifetime substance use and sexual risk taking, respectively).

The majority of adolescents reported that the ICareGuide was somewhat (46%) or very helpful (42%), and 78% of participants who responded to surveys at the 12 month follow-up reported that they still had the guide (42% of all participants who received a guide at enrollment). The majority of youth (80%) reported using the ICareGuide at least once during the study, with sections discussing emergency care, reproductive health, and symptoms information most commonly endorsed. Figure 1 illustrates frequencies of use for ICareGuides by study participants, with consistent use reported across timeframes. The ICareSite was used less frequently by study participants, with 140 unique users locally accessing the site over the study period and a median frequency of 1 visit per local user.

Healthcare utilization significantly decreased for both enrolled and comparison youth in the year following study launch ($t(150) = 5.65, p < .01$ and $t(150) = 5.13, p < .01$, respectively). Similar patterns were observed for foster care clinic visits, non-urgent healthcare visits, and emergency and urgent care. Participant self-report of healthcare use was compared to EHR data from the same time-frame. Across all types of healthcare use, self-report data generally indicated higher healthcare use than EHR data. Specifically, for 12% of youth total healthcare use was higher in EHR data than self-report, 3% had agreement between data sources, and the remaining 85% reported more total healthcare use than was reflected in EHR data.

Multivariate Analyses

To account for existing group differences, generalized multivariate regression models were estimated predicting healthcare use in the year following study launch for enrolled and comparison youth. Healthcare use was non-normally distributed; both Poisson and negative binomial regression models with and without zero-inflation were estimated. A combination of residual variances and results from Vuong's test (25) were used to determine the model that best fit count outcome data for total healthcare use, foster care clinic visits, non-urgent healthcare, and urgent and emergency visits. Analyses were completed using R version 3.5.3.

For total healthcare use, a negative binomial distribution without zero-inflation best fit the data (dispersion = 1.07, residual variance (590) = 597.72, *Vuong's z* = -1.19, $p = .11$). Model results indicated a significant time by group interaction, such that after accounting for the significant effects of demographic characteristics, health risk behaviors, and diagnoses between the two groups, enrolled youth experienced a significantly smaller decrease in healthcare utilization than their peers in the comparison condition (Table 2, Figure 2).

For foster care visits, a Poisson distribution without zero-inflation best fit the data (residual variance (590) = 508.61, *Vuong's z* = -1.61, $p = .06$). Model results indicated that after accounting for the significant effects of demographic characteristics, health risk behaviors, and diagnoses between the two groups, there was a significant decrease in foster care visits over time for both groups, with enrolled youth continuing to have foster care visits more frequently than their peers in the comparison condition.

For non-urgent healthcare visits, a negative binomial distribution without zero-inflation best fit the data (dispersion = 0.39, residual variance (590) = 469.51, *Vuong's z* = 1.38, $p = .08$).

Model results indicated a significant time by group interaction, such that after accounting for the significant effects of demographic characteristics, health risk behaviors, and diagnoses between the two groups, enrolled youth experienced a significantly smaller decrease non-urgent healthcare care than their peers in the comparison condition.

For urgent and emergency care visits, a zero-inflated negative binomial distribution best fit the data (*Vuong's* $z = 3.65$, $p < .01$). Results indicated that there were no significant changes in urgent or emergency care visits with time or by group after accounting for covariates.

Additional Poisson regression models estimated associations between self-reported healthcare utilization and self- use of the ICareGuide for enrolled young people. Those findings (Table 3) indicated that young people who reported using the ICareGuide more frequently also reported higher healthcare utilization across types of use (i.e., primary, specialty, urgent, emergency care) after accounting for covariates.

DISCUSSION

This study evaluated the impact of healthcare education materials on healthcare utilization using EHR data from a pediatric medical center and participant self-report. The ICareGuide had high acceptance, with the majority of youth retaining the guide over the study period. Healthcare utilization declined with age; however, the decline was less severe for total and non-urgent healthcare visits for enrolled youth based on EHR data, and frequency of ICareGuide use was associated with increased self-reported healthcare utilization. Contrary to our hypothesis, there were no significant differences in emergency and urgent care use for those who did and did not receive the ICareGuide. It is possible that the ICareGuide had no impact on emergency and urgent care use; however, youth who received the ICareGuide had more chronic conditions than the comparison sample. As a result, it remains unclear whether ICareGuide use was ineffective, or whether youth in the intervention condition required more emergency and urgent care than the comparison sample due to their disease burden. These preliminary findings suggest that the ICareGuide may be beneficial for assisting young people with accessing healthcare during the transition out of foster care.

Given normative expectation that young people will decrease engagement in pediatric healthcare services in young adulthood, it is not surprising that all adolescents experienced declines in healthcare utilization over the two years of this study. At the freestanding children's hospital where this study took place, adolescent primary care and foster care clinic services continue to age 21. However, age ranges for other specialties vary, consistent with the landscape of healthcare and the transition between pediatric and adult services nationally (19). This could, in part, explain why healthcare use decreased generally, and why there were no differences observed in emergency healthcare utilization for enrolled and comparison youth. Consistent with this explanation, self-reported healthcare use (across all types) increased as self-reported use of the ICareGuide increased. Research evaluating the impact of the ICareGuide objectively and across multiple healthcare settings is warranted.

Supporting access to non-urgent healthcare may be particularly beneficial as foster youth prepare for independence and self-management of healthcare services. Adolescents in foster

care are known to have more acute and chronic health concerns than their peers (13, 26, 27), which may have life-long impact. Connections with outpatient primary and specialty services support access to preventative healthcare services known to confer life-long benefit (28, 29). For that reason, it may be particularly beneficial for adolescents preparing for emancipation to engage with non-urgent healthcare systems, including primary care and medical homes, to receive healthcare transition planning services in preparation for independence in self-management (30).

Our research team initially expected that young people would desire a technology-based platform for ICareGuides; however, young people reported that they desired a durable analog solution that they could carry with them, without relying on technology. Consistent with other studies (31), youth participating on our design team faced challenges with technology maintenance rather than access. They requested a discrete, pocket-sized guide that they could write in, keep organized, and that was durably bound and laminated to protect from damage. The integration of foster youth into the design of the ICareGuide may have contributed to the majority of young people retaining their guide after 12 months. The ICareSite was designed as a companion, with similar information and some technology-based benefits (e.g., maps updated by location) to supplement and provide support in the event that youth lost or misplaced the ICareGuide. It was therefore no surprise that results indicate young people in ICare2CHECK used the ICareGuide more frequently, while the ICareSite was accessed less often. The desire to have an analog version of the ICareGuide may change as technology maintenance improves; future research studying this more closely is needed.

Following ICare2CHECK, CPS has sustained access to ICareGuides for youth in their custody. Young people are provided a guide when they turn 16 and caseworkers and healthcare providers completing exams at the foster care clinic assist young people with completing the guide. It takes approximately 15 minutes to discuss the ICareGuide with young people. The burden introduced by providing ICareGuides to young people is low, with high perceived value for CPS. The ICareGuide has additionally been adapted for dissemination with youth with juvenile justice involvement (32).

While this study holds significant potential to improve healthcare education for young people in foster care, limitations must be considered. A randomized control trial would definitively demonstrate the impact of ICareGuides on healthcare utilization outcomes for adolescents in foster care. Foster youth enrolled in ICare2CHECK were significantly more likely to have a chronic condition or mental health diagnosis than comparison youth, which may have promoted engagement with the healthcare system, biasing findings. Additionally, healthcare utilization was objectively measured within a single healthcare system, and young people were accessing healthcare services outside of our pediatric healthcare system. Replication of this study in a community where health information exchanges or Medicaid billings data are available would be ideal. Finally, healthcare utilization, while important, is not a perfect proxy for health status – the ultimate indicator of adolescent and young adult wellbeing. Studies examining young people’s reports of their health status, quality of life, disease management, missed days from school or work, or other indicators of health (e.g., disease-specific indicators such as Hemoglobin A1c or asthma control) in a longitudinal

manner would be ideal to establish that ICare2CHECK improved health outcomes for young people.

Despite these limitations, this study makes an important contribution in that it provides preliminary evidence that a low-impact intervention may improve healthcare utilization in a population of foster youth who are preparing for emancipation. This is a highly vulnerable group of young people (2, 33) with known health risks in foster care (34, 35) and following emancipation (1, 2, 6, 36). Materials that support conversations and share information to improve healthcare utilization, such as the ICareGuide, may be beneficial in addressing health needs and closing the disparities these young people face in healthcare access and health status in adulthood.

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Abbreviations:

IQ	Intelligence quotient
CPS	Child Protective Services
CCHMC	Cincinnati Children's Hospital Medical Center
EHR	Electronic Health Record

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IMPLICATIONS AND CONTRIBUTIONS

This study evaluated novel healthcare education materials specifically designed for emancipating foster youth. Findings indicate that young people benefit from receiving ICare2CHECK materials, particularly for maintaining engagement with non-urgent ambulatory care. ICare2CHECK may ease the transition to self-management of healthcare for adolescents in foster care.

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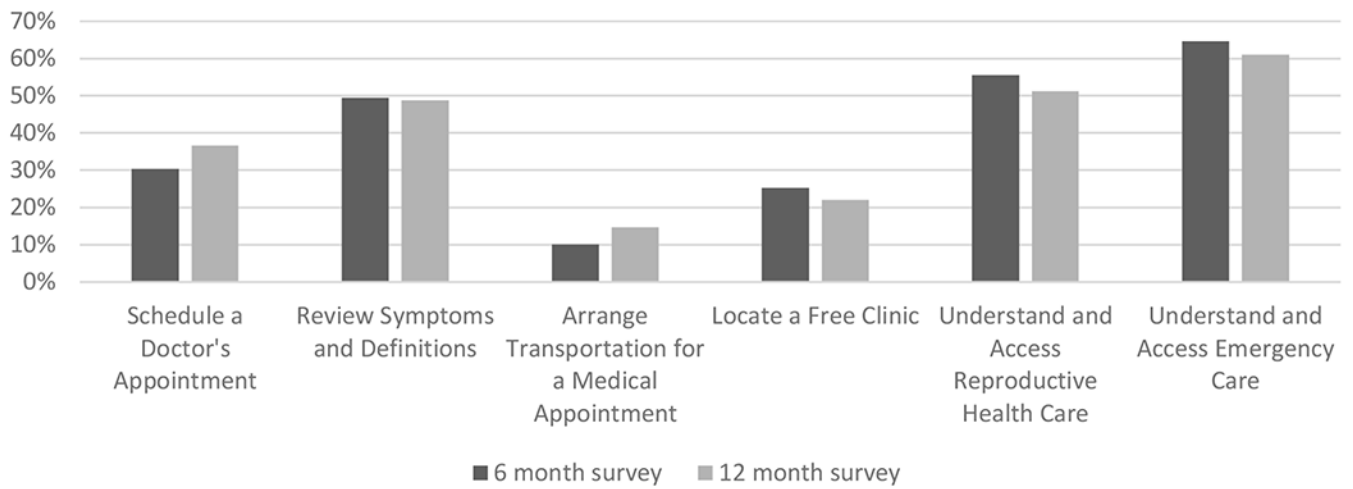


Figure 1. Percentage of participants endorsing use of the ICareGuide for specific health information at the 6 month and 12 month follow-up surveys.

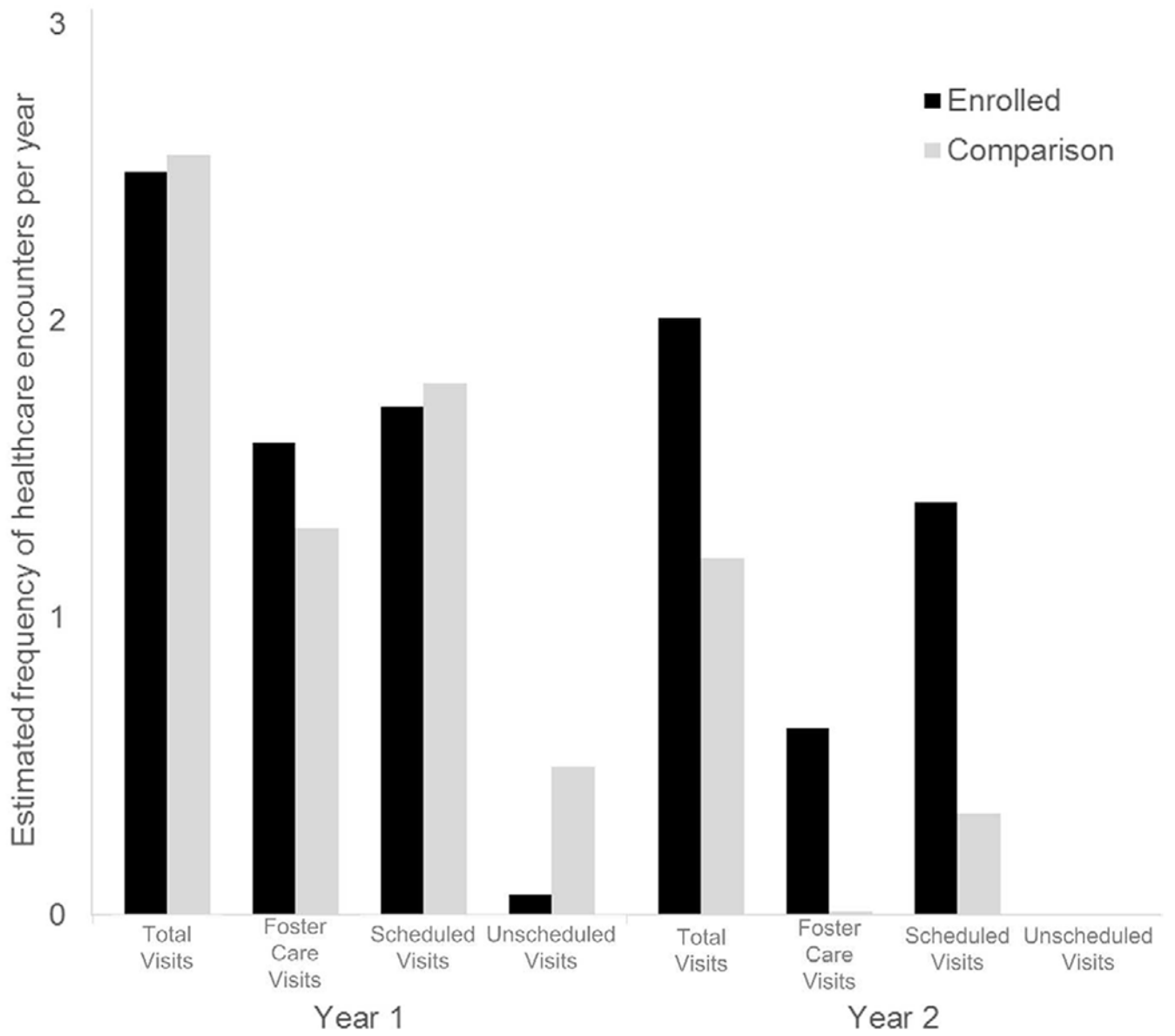


Figure 2. Estimated frequency of healthcare use captured in the electronic health record by encounter type for youth enrolled in ICare2CHECK and comparison youth.

Table 1.

Descriptive statistics for youth in ICare2CHECK enrolled and comparison samples.

Variable	Comparison Sample		ICare2CHECK Enrolled Sample		Significant Group Difference
	M/%	SD	M/%	SD	
Age (Year 1)	18.72	1.39	18.08	1.36	t (300) = 4.06**
Adolescent girls	0.54		0.54		ns
Racial/Ethnic minority	0.75		0.75		ns
Number of placements	7.06	5.45	6.62	4.84	ns
Length of time in care	3.17	3.29	2.91	3.16	ns
Legal Status					ns
Temporary custody	0.19		0.16		
Permanent custody	0.20		0.12		
Planned permanent living arrangement	0.61		0.72		
Primary Removal Reason					ns
Neglect	0.59		0.61		
Physical abuse	0.12		0.04		
Sexual abuse	0.04		0.03		
Child behavior problems	0.19		0.28		
Parental substance use	0.04		0.01		
Emotional abuse/neglect	0.02		0.03		
Total Health Care Use					
Year 1	3.19	5.49	4.39	4.40	t (240) = -2.09*
Year 2	0.75	1.75	2.60	4.07	t (203) = -5.13**
Mandated Foster Care Visits					
Year 1	0.63	1.10	1.20	1.24	t (300) = -4.22**
Year 2	0.15	0.47	0.40	0.75	t (300) = -3.47**
Scheduled Visits					
Year 1	1.78	4.93	2.26	3.41	ns
Year 2	0.42	1.27	1.61	3.47	t (300) = 2.61**
Unscheduled Visits					
Year 1	0.78	1.51	0.93	1.59	ns
Year 2	0.18	0.57	0.59	1.28	t (300) = -3.60**
Lifetime substance use (y)	0.34		0.52		$\chi^2 (1) = 9.11^{**}$
Current substance use (y)	0.28		0.40		ns
Lifetime sexual risk behavior (y)	0.70		0.85		$\chi^2 (1) = 7.28^{**}$
Any chronic condition (y)	0.09		0.35		$\chi^2 (1) = 27.70^{**}$
Any mental health diagnosis (y)	0.26		0.63		$\chi^2 (1) = 39.06^{**}$

Note: Age, race, ethnicity, number of placements, length of time in care, legal status, primary removal reason were determined based on child welfare report. Gender, healthcare use, lifetime substance use (i.e., ever endorsed tobacco, alcohol, marijuana, or illicit substance use, any encounter), current substance use (i.e., endorsed tobacco, alcohol, marijuana, or illicit substance use during an encounter over the past 12 months), lifetime sexual risk behavior (i.e., multiple partners, inconsistent condom use, sexually transmitted infection diagnosis), chronic condition diagnosis, and mental health diagnosis was based on electronic health record data.

Multivariate model results predicting total healthcare use, mandated use, scheduled use, and unscheduled visits

Table 2.

	Total		Mandated		Scheduled		Unscheduled	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	6.40**	0.84	5.14**	0.98	5.39**	1.28	-0.78	1.73
Group	-0.06	0.15	0.29*	0.14	-0.08	0.23	-0.43	0.22
Time	-1.36**	0.17	-1.29**	0.23	-1.45**	0.26	-0.64	0.38
Group*time	0.87**	0.21	0.33	0.28	1.13**	0.33	0.27	0.42
Age	-0.32**	0.04	-0.32**	0.05	-0.30**	0.07	-0.01	0.10
Gender	0.68**	0.11	0.35**	0.11	0.79**	0.17	0.75**	0.19
Minority	-0.19	0.12	0.19	0.13	-0.39*	0.19	-0.08	0.20
Length of time in custody	-0.01	0.02	-0.04*	0.01	0.02	0.02	-0.07*	0.03
Number of placements	0.01	0.02	0.04**	0.01	-0.02	0.02	0.07*	0.03
Substance use	0.71**	0.12	0.49**	0.11	0.65**	0.19	0.25	0.19
Sexual Risk	0.00**	0.00	0.01**	0.00	0.00	0.00	0.00	0.00
Chronic conditions	0.49**	0.12	-0.22	0.13	0.81**	0.19	0.12	0.19
Mental health diagnoses	0.23*	0.11	-0.08	0.11	0.27	0.18	0.92**	0.20

** p < .01;

* p < .05

Table 3. Multivariate Poisson regression analyses predicting self-reported healthcare utilization over a 12-month period, predicted by self-reported frequency of ICareGuide use among those in the enrolled condition (n = 151)

Variable	Primary Care		Specialty Care		Urgent Care		Emergency Care	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	-0.40	0.77	-4.80**	1.28	10.17**	2.66	3.16	2.25
ICareGuide use	0.03***	0.01	0.03*	0.02	0.10**	0.02	0.05*	0.02
Age	0.09*	0.04	0.24**	0.07	-0.58**	0.15	-0.16	0.12
Gender	0.22*	0.11	0.74**	0.20	0.03	0.27	-0.06	0.26
Minority status	0.04	0.13	0.12	0.25	-0.92**	0.26	-1.03**	0.25
Substance use	-0.03	0.10	0.40*	0.17	0.17	0.25	0.02	0.24
Sexual risk behavior	0.15	0.11	-0.28	0.19	-0.17	0.28	0.13	0.28
Chronic condition	-0.08	0.16	-1.48**	0.46	0.45	0.40	-0.62	0.52
Mental Health diagnosis	-0.07	0.11	0.26	0.19	-0.77**	0.28	-0.27	0.26

* p < .05;

** p < .01