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Evaluation of a Substance Abuse Screening Tool in the Pediatric Emergency Room

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Abstract

Background: Substance abuse among adolescents is one of the most serious social health problems in the United States. The prevalence of alcohol use in adolescents is as high as 80%, while opioid overdose deaths among adolescents have risen by greater than 50% in the last 10 years. Alcohol, tobacco, and other substance use has also increased among youth and is not being properly evaluated in the pediatric hospital setting. The purpose of this project was to evaluate the use of a substance abuse screening tool with SBIRT trained staff in the pediatric emergency room setting.

Methods: The CRAFFT substance abuse screening tool was administered to a convenience sample of adolescent patients aged 12 to 17 years old, seeking care in the pediatric emergency department from Feb-April 2023. Quantitative data was collected via prospective chart review during the emergency department visit. Data collected included number of CRAFFT screenings administered, number of positive CRAFFT screenings, screenings done by SBIRT trained staff, and referrals to treatment needed. The Iowa Model of Evidence-Based Practice served as the framework.

Results: CRAFFT screenings were offered to ($N=76$) patients and ($n=62$) screenings were completed. Of those screened, 25% ($n=16$) screened positive with a CRAFFT score of two or higher and were offered a referral to treatment. Of those who were offered a referral to treatment, 44% ($n=7$) accepted the referral.

Implications for practice: Widespread utilization of the CRAFFT substance abuse screening tool in the pediatric emergency department setting may provide early identification of adolescents at risk for substance abuse and offer them referrals to appropriate treatment.

Substance Screening Tool in the Pediatric Emergency Room

Substance abuse among adolescents is one of the most serious social health problems currently in the United States (U.S.). Substance abuse can cause serious health effects, can affect cognitive processes, and can lead to serious accidents, injuries, and even death (Kaur et al., 2022). In the U. S., the prevalence of alcohol use in adolescents as high as 80%. In addition, three in 10 adolescents experience problems related to their alcohol use (Isaksson et al., 2020). In 2021, 1,146 adolescents had an opioid overdose death, which is an increase of greater than 50% from 2010 (UCLA, 2022). Also, more than 10% of adolescents have already experimented with opioid drugs prior to age 18 (Linton et al., 2021). Alcohol, tobacco, and other drug use has increased among youth by more than 15% in the last 20 years and is not being properly evaluated in the pediatric hospital setting (Smith et al., 2020).

Kaur et al. (2022) highlighted parental monitoring and peer pressure as two of the most common relational risk factors leading to substance use in adolescence. Adolescents with more actively involved parents were less likely to participate in high-risk behaviors and had lower levels of substance abuse. Adolescents with friends who use substances, were 50% more likely to also participate in substance use. Other factors relating to increased substance usage at a younger age was a history of both internalizing behavior such as depression and externalizing behaviors such as sensation seeking, conduct problems, and antisocial behavior (Isaksson et al., 2020; Kaur et al., 2022).

Sexual orientation is an indicator for increased substance use among adolescents. Pitzer et al. (2020) found that 29% of lesbian and gay, and 32% of bisexual high school students reported a history of substance use compared to only 19% of heterosexual high school students. Additionally, lesbian, gay, and bisexual students were using substances

such as alcohol and other drugs as a coping mechanism to deal with discrimination they often faced. Trauma exposure and poverty have also been noted as causes for increased substance use in the adolescent population. Young people living in low socioeconomic areas, unstable home, or neighborhood environments, and those who have either experienced or witnessed adverse events were more likely to have used substances prior to age 18 (Linton et al., 2021).

Other risk factors for substance abuse were found to be impulsivity, difficulty with emotional regulation, lack of religious involvement, history of psychiatric disorders, previous e-cigarette exposure, and high accessibility to drugs (Isaksson et al., 2020; Nawi et al., 2021). Nawi et al. (2021) also found that history of child maltreatment resulted in drug prevalence use as high as 85.7%, and adolescents in foster care were 50% more likely to use marijuana than prior to being in foster care. There has also been a significant increase in hospital admissions related to marijuana use. Overall, the number of admissions for those aged 12 to 14 increased 50.4%, those aged 15 to 17 increased 66%, and those aged 18 to 20 increased 71.6% (Marzell et al., 2017). Marzell et al. (2017) found that there may have been some over-identification of marijuana use in adolescents, however, the authors did feel that there was identified problematic use in those adolescents that were admitted to the hospital for treatment.

Patnode et al. (2020) found that approximately 84% of those 12 and older who needed treatment for illicit substance abuse did not receive treatment. Providers who are screening adolescents for substance abuse must know how to counsel and when to refer patients to treatment. According to the U.S. Preventative Services Task Force there is no

evidence of harm against screening adolescents for illicit substance use (Patnode et al., 2020).

Pfaff et al. (2021) a validated screening tool was used less than 50% of the time when screening adolescents for substance abuse in the emergency room setting. Validated screening tools for this setting include but are not limited to: The Alcohol Use Disorders Identification Test (AUDIT), The Problem Orientated Screening Instrument for Teenagers (POSIT), Cut down, Annoyed, Guilty, and Eye-opener (CAGE), and Car, Relax, Alone, Forget, Friends, and Trouble (CRAFFT) (Kulak & Griswold, 2019; Pfaff et al., 2021; USPSTF, 2020). However, not all screening tools are validated for use in the adolescent population. Of those listed, only the POSIT and CRAFFT are validated with this population.

In an urban, level one, pediatric trauma center and emergency room, in the Midwest there is an opportunity to use a substance abuse screening tool. The purpose of this project is to evaluate the use of a substance abuse screening tool with SBIRT trained staff in the pediatric emergency room setting. The Iowa Model of Evidence-Based Practice will serve as the framework for this quality improvement pilot project with a problem-focused trigger. The Iowa model was chosen as it has been noted in the emergency room setting, often substance use is not detected by the primary emergency room provider team. It is not until consult services are called, such as psychiatry or social work, where this is identified. The problem focused trigger was several patients have been observed to have significant substance abuse disorders that were missed by the primary emergency room team. Pediatric patients are not screened consistently for substance abuse in this emergency room setting and it is a priority for the hospital to

ensure that patients are screened properly. It has also been shown, even when screening occurs, proper referrals do not occur, therefore SBIRT training is being done with the staff to assess if this improves referrals to treatment. The aim of this project was for 25% of patients aged 12-17 presenting to the emergency room to have a CRAFFT screening tool administered by an SBIRT trained staff member. The primary outcome measure was to assess the number of CRAFFT screening tools completed. The secondary measures were the number of adolescents referred for treatment services and those who were screened by a SBIRT trained staff. The study question for this project: In an urban, Midwestern, level one pediatric emergency room and trauma center, in adolescents aged 12-17, what is the effect of implementing a substance abuse screening tool on the identification of substance abuse, treatment, and referrals within a three-month period?

Review of Literature

A review of the literature was conducted using the- CINAHL, PubMed, and Medline (EBSCO) databases. Key search terms and phrases included *substance abuse, substance use, drug use, illicit substance use, adolescents, teenagers, youth, screening in pediatric emergency department, and screening tools*, with the use of Boolean operators AND and OR. The literature search initially generated 2,078 results. Inclusion criteria used included studies from 2017-2022, adolescents aged 12 to 17 years of age, emergency room screening, screening tool, substance abuse in adolescents, SBIRT training, articles published in the English language. Exclusion criteria were publications which were not focused on substance abuse/use screening, non-emergency room visits, screening tools were not used, no SBIRT training, studies including older adults or those including children under the age of 13, and studies not published in the English language. After inclusion and exclusion criteria was applied, 50 publications resulted and ten were

retained for use in this literature review. In the ten publications used included a meta-analysis, two randomized control trials, and several systematic reviews.

Adolescent substance abuse is on the rise in the U. S. and there is a need for adolescents to be properly screened for substance abuse when assessed by a medical provider (Kulak & Griswold, 2019; Pfaff et al., 2021; USPSTF, 2020). Evaluation of adolescent substance abuse via a verified screening tool may be the only way for a provider to identify if a patient is using illicit substances. Adolescents who are identified as at risk for substance abuse can receive counseling and referrals to appropriate resources. This can best be provided by SBIRT trained staff (Alinsky et al., 2020; USPSTF, 2020). According to Pfaff et al. (2021) adolescents have low rates of preventative visits so when an adolescent visits the emergency room, performing a risk assessment screening is important.

In the emergency room setting it is common to complete a focused assessment which can lead to a missed opportunity to screen for substance abuse. Pediatric emergency room providers must be educated on risk factors to ensure proper screening takes place. For example, Caucasian children have been found to have the highest rates of alcohol use in late adolescence, while Hispanic children have been found to have the highest rates of alcohol use in early adolescence (Isaksson et al., 2020). Additionally, risk factors for alcohol use in early adolescence includes internalizing behaviors for females and externalizing behaviors in males (Isaksson et al., 2020). Nawi et al. (2021) also found specific internalizing and externalizing behaviors, such as depression and conduct disorder, were associated with increased substance use in adolescents. Adolescents with a history of child maltreatment, trouble identifying or describing emotions, or chronic

medical comorbidities were also at higher risk for substance use (Isaksson et al., 2020; Nawi et al., 2021).

Nawi et al. (2021) also found protective factors which lead to decreased risk for substance use in adolescents. It is imperative for pediatric medical providers to understand these protective factors as they can be crucial in determining a need for additional services or referrals from the emergency department. For example, youth who were more optimistic and mindful were found to be less likely to use substances than peers without these personality traits (Nawi et al., 2021). Family protective factors included fathers who were actively involved in their children's lives and families with strong religious beliefs (Nawi et al., 2021). Unlike depression, anxiety has not been linked to increased rates of substance use. Overall, those with anxiety were found to be at lower risk of substance use, however, this may be related to those with anxiety avoiding social situations where alcohol is likely to be available (Isaksson et al., 2020; Nawi et al., 2021).

Understanding trends in substance abuse is essential for the pediatric emergency room provider when thinking about screening adolescent patients. As both medical and recreational cannabis use becomes legal across the U. S., the negative effects on development should be considered. Since the legalization of cannabis in many states, adolescents in these states have been noted to have higher rates of use and decreased concerns about risk factors associated with use (Marzell et al., 2017).

Another trend in substance abuse is with legally prescribed substances. Prescription opioid misuse among adolescents leads to almost 50 deaths per day in the U.S. and is also the cause of over 33% of the opioid-related overdose deaths (Bonar et al.,

2020). Trauma and poverty are reported as key factors in adolescents who misuse prescription opioids (Linton et al., 2021). Misuse of prescription opioids can be a precursor to the use of opioids, such as heroin. Pediatric providers should be able to identify adolescents who are at risk for opioid misuse, and they may be the same adolescents who misuse other substances such as alcohol and cannabis (Bonar et al., 2020). Benzodiazepines may not always be prescribed to adolescents; however, they may have easy access to them in their home or via friends. Among those under the age of 18 benzodiazepine use has increased from 37% in 2000 to 47.7% in 2015 (Fournier et al., 2021). Screening adolescents for misuse of benzodiazepines is particularly important due to the high risk of withdrawal which can lead to death (Fournier et al., 2021).

Involvement in social media platforms is a trend medical professionals may not often consider when evaluating adolescents for substance abuse. There are many different social networking sites, and many have public and private communications options. Social networking is a low to no-cost way for adolescents to learn about trends in new drugs and drug combinations. According to Kazemi et al. (2017), most often, those using social media platforms to discuss substance use were college students 17 to 19 years old. However, users as young as 11-years-old were found to also be using social networking sites to discuss substance use. Social media has also been found to lead to trends in substance use which adolescents may feel peer pressured into trying.

Screening rates for adolescent substance use in the emergency room setting are low. Yearly preventative visits for adolescents are as low as 30%, however, 1.5 million adolescents go to the emergency room for all their health care needs in the United States. As those teenagers that use the emergency room for this purpose are more likely to be at-

risk youth or those with chronic illness, it is vital that substance use screenings occur in this setting (Pfaff et al., 2021). Pfaff et al. (2021) found that on average 10% of those seen at pediatric medical institutions were screened for substance use. In 10% of those screened, over one-fourth had incomplete screenings done. Even in emergency department settings where screening was taking place, less than 50% used appropriate screening tools (Pfaff et al., 2021).

In 2019, greater than 80% of adolescents who needed treatment for substance abuse did not receive it (Patnode et al., 2020). Providers in the pediatric emergency room setting often cite time constraints, poor staffing, availability and understanding of proper screening tools, and concerns about guardians not being comfortable with questions as reasons why screenings are not completed (Pfaff et al., 2021). Though one can appreciate the time constraints which often occur in the critical care setting, many substance abuse screening tools can be completed with one to two questions or in under two minutes (Patnode et al., 2020).

One of the tools approved for use in adolescents in the emergency room setting is the CRAFFT screening tool. The CRAFFT substance abuse screening tool is considered positive with a score of two or greater. The CRAFFT screening tool has been shown to be consistent and reliable with a Chronbach's alpha score of 0.85 (Ola & Atilola, 2017). Proper screening and appropriate referrals were associate with decreased substance use for both those adolescents with unhealthy drug use as well as those with a diagnosed drug use disorder (Patnode et al., 2020).

The American Academy of Pediatrics recommends using the evidence-based process "Screening, Brief Intervention, and Referral to Treatment," also known as

“SBIRT,” as a method to assess and treat adolescent patients who are using substances (Alinsky et al., 2020). Despite this recommendation, many barriers exist to using it including: lack of training for the providers on the SBIRT model, poor integration into the electronic medical record systems, and difficulty incorporating screening into standard emergency room workflow practices (Alinsky et al., 2020). One of the limitations found in all these studies was they all used self-reporting which may be less reliable. Though self-reporting may not always be reliable, screening has been valuable as more than 70% of adolescents who were properly screened reported interest in interventions (Pfaff et al, 2021). This was also true for those adolescents who screened negative for substance use, showing screening can be a protective factor for patients who have not yet used illicit substances.

Methods

Design

This QI pilot project utilized descriptive statistical analysis. Quantitative data was collected via prospective chart review. Data collected included number of CRAFFT screenings administered, number of positive CRAFFT screenings, screenings done by SBIRT trained staff, and referrals to treatment needed.

Setting

This QI pilot project took place in a pediatric level 1 trauma center. This pediatric emergency room is in an urban setting in the Midwest which sees more than 47,000 patients annually. From 2020-2021 this emergency room saw more than 1,500 behavioral health patients.

Sample

This pilot project used a convenience sample of pediatric patients aged 12-17 who presented for medical care to the pediatric emergency room. Patients were in two of eight predetermined pods in the emergency room. Trauma patients, patients who are critically ill, and non-verbal patients were excluded. Inclusion criteria used included adolescents aged 12-17 years of age and those presenting to the emergency room. Exclusion criteria children under the age of 12, children over the age of 17, children not presenting to the emergency room, and trauma patients.

Approvals

Formal written approval was sought and obtained from the participating organization's department of research, quality, safety, and practice excellence department on 5/19/2022. Approval was also sought from the director of behavioral health and the director of emergency medicine at the organization. Committee approval was received from the University of Missouri-St. Louis. IRB approval was sought through the University of Missouri-St. Louis; however, the university deemed this a QI project and IRB approval was not indicated.

Procedures

Using the CRAFFT screening tool versus the current practice without consistent screening is a quality improvement project that has been approved by the hospital and was led by the Doctor of Nursing candidate. The CRAFFT screening tool was already built into the current EPIC charting system at the hospital and the emergency room nursing staff has already participated in training on how to use this screening tool. Prior to the start of the QI pilot project, nurses also participated in SBIRT training to be

properly trained on using this screening tool and how to refer patients to treatment when screening is positive. Administration of the CRAFFT screening tool was administered by the emergency nurse during the patient's time in the emergency department. All patients who screened positive were offered a referral to treatment. The bedside nurse placed appropriate referrals to the Youth & Family Treatment, Enhancement, & Expansion (TREE) program for substance use treatment.

Data collection and analysis

Using the Iowa Model of evidence-based practice framework CRAFFT screenings were collected via prospective chart review. Data included CRAFFT screening, CRAFFT score, if staff was SBIRT trained, and if referral for substance use treatment was needed or not. To assess the effect of using the CRAFFT screening tool in the emergency department setting descriptive statistics were analyzed using SPSS.

Results

Demographics

The sample included 76 patients aged 12 to 17 who presented to the emergency room. There were 25 ($n=25$) male patients (32.8%), 41 ($n=41$) female patients (53.9%), four ($n=4$) non-binary patients (5%), five ($n=5$) transmale patients (6%), and one ($n=1$) transfemale patient (1%) (appendix A). Of the 76 patients, 62 (81.5%) agreed to participate in the CRAFFT screening tool. There were three ($n=3$) 12-year-old patients screened (4 %), ten ($n=10$) 13-year-old patients screened (16%), five ($n=5$) 14-year-old patients screened (8%), 25 ($n=25$) 15-year-old patients screened (40%), 12 ($n=12$) 16-year-old patients screened (19%), and seven ($n=7$) 17-year-old patients screened (11%).

CRAFFT screenings

During the implementation period of February 1st, 2023 through April 30th, 2023, 76 patients met the inclusion criteria of being in the emergency room, being ages 12 to 17 years old, and being in one of two emergency room pods where CRAFFT screening tool was being implemented. A total of 62 CRAFFT screenings were completed out of 76 patients offered a screening. Screenings were conducted on 82% ($n=62$) of patients seen by a nurse in the emergency room. Of those patients who were screened, 26% ($n=16$) had a positive CRAFFT screening result of two or higher. All patients who screening positive were offered a referral to treatment, however, only seven ($n=7$; 44%) accepted the referral to treatment. The most common reasons documented for declining a referral to treatment were the patient not thinking they needed the referral, that they did not want their parents aware of their substance use, and several made statements that “it is just marijuana.”

Discussion

Execution of this QI pilot project accomplished the purpose to screen, identify, and refer adolescent patients at risk for substance abuse. Of the patients seen during the timeline of the QI pilot project, 82% ($n=62$) of patients were screened. This achieved the goal of a 25% screening rate. Of the 62 screenings that were done, 26% ($n=16$) had a positive screening result. Of those, 44% ($n=7$) received a referral to treatment. All the patients (100%; $n=7$) who screened positive and received a referral to treatment were screened and referred by an SBIRT trained nurse. Those who screened positive but did not receive a referral to treatment were not screened by an SBIRT trained nurse.

It is important to note that though this QI pilot project was only done in certain areas of the ER, there were still 16 positive screenings in these areas. This is an average of more than one positive screening result per week during the implementation period. Though only seven patients of the 16 who screened positive were referred to treatment, it is likely none of these patients would have been referred to treatment without proper screening being done. This is consistent with what Patnode et al. (2020) found which was that approximately 84% of those 12 and older who needed treatment for illicit substance abuse did not receive it. This may be due to time constraints in the emergency room setting, staff being uncomfortable with the referral to treatment process, as well as patients not wanting to address substance abuse when they are in the emergency department setting.

Limitations of this QI project were patients who had learning disabilities or were a state of mental health that did not allow them to properly participate in the CRAFFT screening. There was also a lack of SBIRT trained nurses. Though many of the ER nurses received this training prior to the implementation of the QI pilot project, there was a staffing change at the beginning of the project which included nurses who were not part of the ER core staff to care for the patients in the designated CRAFFT screening pods. Additionally, in the future increased time would allow for more screenings to be completed and further data to be analyzed.

Recommendations for future practice include widespread use of the CRAFFT substance abuse screening tool for all patients aged 12 through 17 who present to the emergency department. There is currently work being done to move this screening from paper format to iPad format. This may be more convenient for staff as well as more

discreet for the patients. Another consideration is who reviews positive screenings and discusses them with the patient. For the purpose of this QI project, nursing staff was utilized, however not all the nurses had additional SBIRT training to help with referrals to treatment. In the future, using a smaller pool of staff to meet with these patients who screen positive may reduce missed opportunities for patients to be referred to treatment.

Conclusion

In summary, substance abuse in adolescence is a public health concern not being properly screened for in the pediatric emergency room setting. Proper screening and referrals to treatment have been publicized as leading to a reduction in substance abuse. The use of the Iowa Model for evidence-based practice allows for a stepwise approach to be taken to improve substance abuse screening rates in the urban pediatric emergency room setting. This will be accomplished by providing SBIRT training to the emergency room staff as well as using the CRAFFT screening tool on those age 12 to 17 who presenting to the emergency room. In the future, those who screen positive will continue to be referred to appropriate substance abuse treatment programs via Youth & Family TREE program.

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Appendix A

Table 1

Demographic Characteristics of Participants, *N*=76

Characteristic	N	%	M	SD	Range
Age	76		14.97	1.4	5
Gender					
Male	24	31.6%			
Female	43	56.6%			
Non-Binary	3	3.9%			
Transmale	5	6.6%			
Transfemale	1	1.3%			

**Note.* Output obtained using IBM SPSS Statistics for Windows, version 27.0