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Assessing the role of digital media and their relationship to psychiatric crises in adolescent

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Thesis

**ASSESSING THE ROLE OF DIGITAL MEDIA AND THEIR RELATIONSHIP
TO PSYCHIATRIC CRISES IN ADOLESCENTS**

by

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ASSESSING THE ROLE OF DIGITAL MEDIA AND THEIR RELATIONSHIP TO PSYCHIATRIC CRISES IN PEDIATRICS

STEPHANIE KNYCH

ABSTRACT

BACKGROUND

Digital media is used by tons of teenagers, and there is some evidence that it is playing a role in psychiatric crises, although there is very little descriptive data on it. With the increased use of social media, there is a higher chance for cyberbullying and spreading of misinformation. Social media posts can include distressing or sensationalized content, normalize suicide and spread information about suicide methods which may increase suicidal behaviors [3] and exposure to suicide cluster related social media has been associated with SI and SA during a suicide cluster [2]. Multiple studies have shown that there is an association between psychiatric issues and social media use. Youths with mental health conditions such as ADHD (attention deficit hyperactive disorder), ASD (autism spectrum disorder), and schizophrenia are especially vulnerable to problematic internet use (Ruckwongpatr et. al, 2022). We know that digital media plays a role in ED admissions and that digital and social media have mental health effects on youth. It is critical to get a better sense of the kids that are coming into the ED due to digital media complaints and whether or not devices present as an issue while they are in the ED and how that is dealt with.

OBJECTIVES

Because existing studies focus more on the association between psychiatric issues and digital media use, this study will focus on kids that are coming into the emergency room due to digital media complaints and whether or not devices present an issue while they are in the ER and how those are dealt with.

Aim 1: Characterize digital media and electronic device related psychiatric crises resulting in emergency room presentation in youth aged 6-18 by:

- A: Determining the incidence of digital media/electronic device related psychiatric crises.
- B: Determining relationships between digital media and electronic device related psychiatric crises and demographic variables and psychiatric diagnoses.
- C: Characterizing the frequency of specific categories of digital media and electronic related psychiatric crises.

METHODS

The study used Power Chart, an electronic medical record software, to access psychiatric consultation records from Boston Children's Hospital in 2022. Data was collected using a spreadsheet listing medical record numbers (MRNs), accessing patient charts via Power Chart, specifically focusing on admissions related to psychiatric issues in the emergency room. The study examined gender, psychiatric history, presenting

problems related to digital media use, and conflict types. Disposition, suicidal ideation, homicidal ideation, and digital media plan documentation were also analyzed. Conflict types during boarding, including behavioral dysregulation and access to restricted content, were coded. Data was analyzed using tables and graphs to understand relationships and patterns within the dataset.

RESULTS

The study reviewed a total of 1,811 encounters, and analyzed data from the categories of chart-identified, patient-identified gender, race/ethnicity and age, to explore associations with digital media (DM) related conflicts. Chart-identified gender distribution showed 61% of encounters involving individuals identifying as female and 39% as male. Patient-identified gender revealed 51% encounters with someone identifying as female, 38% as male, 3.76% as transgender, and 7.2% as non-binary. For the racial/ethnic category, 37% of encounters identified as non-Hispanic white, 17% as Black, 1.16% as biracial, 1.65% as Hispanic, 4.14% as Asian, 0.17% as Native American and 39% categorized as unknown race. The majority (77%) of encounters involved youth with prior psychiatric diagnoses, including adjustment disorder (1.1%), depression (28%), anxiety (27%), trauma (7.8%), ADHD (27%), and ASD (8.7%). Of the encounters related to DM, 41.5% reported dysregulation upon separation from devices, 3% experienced interpersonal conflicts online, 28% engaged in high-risk online behaviors, and 28% encountered other forms of DM conflict. Analysis revealed disparities in DM-related conflicts by race, with 3.6% of non-Hispanic white, 7.5% of Black, 4.76% of

biracial, and 5.33% of Asian encounters reporting conflicts. Transgender youth had significantly higher odds of DM-related conflicts, while non-binary identification was associated with decreased risk. Depressive disorders were significantly associated with DM conflicts, but other psychiatric diagnoses and past psychiatric history did not show significant associations. Age exhibited a statistically significant correlation with DM conflicts while adjusting for race and gender.

CONCLUSION

This study highlights the importance of researching how digital media use influences psychiatric emergency room visits among youth, given that research has shown an increase in such presentations and the role of digital media-related conflicts in exacerbating these psychiatric crises. Findings show that adolescents frequently present to the emergency room due to issues like online conflicts, emotional distress upon device separation, and engagement in risky online behaviors, particularly among those diagnosed with depression. Future research should further explore these relationships across different types of digital media use and psychiatric diagnoses, while also developing standardized assessment tools to enhance understanding of digital media-related conflicts in emergency settings and exploring demographic variations in these presentations.

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LIST OF ABBREVIATIONS

ADHD.....	Attention deficit hyperactivity disorder
ASD.....	Autism spectrum disorder
DM.....	Digital media
ED.....	Emergency department
ER.....	Emergency room
FoMO.....	Fear of missing out
IGD.....	Internet gaming disorder
PIU.....	Problematic internet use
PTSD.....	Post traumatic stress disorder

INTRODUCTION

Digital media includes a range of online platforms and technologies that facilitate communication, interaction and information exchange. Platforms include social media networks, multimedia sharing platforms and news outlets and online forums. Social media is a large part of digital media and can be defined as social network websites that allow individuals to build public profiles and create and view lists of users with whom they share a connection (Boyd, et. al., 2007). It is often a space where individuals can share moments, events, and content with other individuals or their community. Social media also allows individuals a platform to befriend or connect with other individuals around the globe. Since the start of MySpace and Facebook in the early 2000s, the popularity of social media has since skyrocketed, with the current generation using newer social media platforms such as Instagram, Snapchat, and TikTok. Digital media allows the sharing of information across different formats such as video, audio and text (Chassiakos, et. al., 2016).

Digital Media Use in Adolescents

Social media platforms can provide community connection to individuals who struggle with face-to-face interactions (e.g. those with ASD or social anxiety disorder). Social media also offers individuals the ability to control their social interactions online, and decreases concerns regarding inability to interpret non-verbal cues during face-to-face conversations (Barber, 2017).

Teens engage in a variety of online activities, from socializing and connecting with others on social media platforms, to consuming entertainment and seeking

information. A study by Lenhart, 2015, looked at the types of social media platforms that teenagers ages 13 to 17 report using. 71% use facebook, 52% use instagram, 41% use snapchat, 33% use twitter, 33% use google+, 24% used vine, 14% use tumblr and 11% noted a different social media site. (Lenhart, 2015). Teens ages 13-17 are reported to be online frequently with 92% reporting daily, 24% reporting constantly, 56% going online several times a day, 12% reporting once a day, 6% report weekly and only 2% go online less often (Lenhart, 2015). More recently, digital media such as Instagram, Snapchat and TikTok are very popular among youth which allow for social interaction, and content creation (Rideout et. al., 2021). YouTube is also a popular media that allows for entertainment and even education for young users, ranging from tutorials to music videos (Lenhart et. al., 2015). Online gaming is another form of digital media that is popular with adolescents (Ferguson, 2011) as well as streaming services like Netflix or Spotify, which allow youth to access movies, TV shows and music (Rideout et. al., 2021). Research has found that adolescents today spend a significant amount of time using digital media on a daily basis, on average spending approximately 7 hours and 22 minutes per day, including watching TV, using social media, gaming, and other online activities (Rideout et. al., 2021).

Risks and Benefits of Adolescent Digital Media Use

Learning benefit of Digital Media Use

Digital media has both risks and benefits for adolescents. One example of a benefit is using digital media to watch informational videos or read articles that aid in the learning of individuals. Digital learning is when the material is presented with digital

forms of media such as texts/articles or pictures in order to increase personal knowledge and skills (Lin et. al., 2017). When teaching with technology and digital media, it can make learning more efficient and keep students' attention longer (Lin et. al., 2017). There are various applications, like YouTube, that allow people to watch educational videos and combine visuals with text in order to lead to better understanding of material. Without digital media, it would be much more difficult to readily learn new information. Digital media is also very convenient, as most people are able to access it on their phones from anywhere in the world.

Connection with others as a benefit of Digital Media Use

Another benefit is the way that digital media allows adolescents to connect with friends and others online, creating different communities. Being connected with others has a positive impact on people, and people who receive more text messages or social media updates feel more connected to others (Kushlev, 2015.). Digital media is especially helpful in terms of allowing individuals to maintain contact with family, friends and professional contacts. Digital media also allows people to connect in other ways by promoting access to news articles and educational materials in which they can go on to discuss and learn from others.

Connection with others as a risk of Digital Media Use

Although a benefit from digital media is connectedness with others, it can potentially become a risk as well. In a study by Kros. et. al., 2013, they tracked how people felt throughout the day and it was found that they felt worse when they used

Facebook more. People might feel more emotionally distressed when constantly using digital media due to digital social interactions potentially replacing in person interactions. Even in person, people tend to focus their time on digital media such as texting or using social media (Kushlev, 2015).

Risk of Bullying with Digital Media Use

Bullying, specifically cyberbullying, is also a risk that comes along with digital media use. Cyberbullying is bullying that includes using technology, such as the internet/social media sites, which can be the source of damaging or destructive language (Obaidat et. al., 2023). Individuals who cyberbully use digital media to purposefully cause harm or suffering to others. Using digital media for 3 or more hours a day has been associated with cyberbullying, and cyberbullying has been associated with depression, substance use and suicide attempts (Bottino et. al., 2015). It has also been found that instant messaging, relationship issues, hyperactivity/inattention problems and risky behavior on the internet were factors associated with cyberbullying (Bottino et. al., 2015). Cyberbullying has been found to be associated with depressive symptoms and it has been found that reported harassment on the internet was higher among individuals who presented with more severe depressive symptoms (Bottino et. al., 2015). Cyberbully is common for adolescents and according to recent research by Hinduja et. al., 2020, over 20% of teens have been exposed to cyberbullying in some way. 15% have seen

cyberbullying or been victims of it, 6% had been cyberbullied many times and 8.5% were cyberbullies either once or twice (Hinduja et. al, 2020).

Risk of Digital Media with increased internet use

Since the onset of the COVID-19 pandemic, youth Internet use has increased (Fernandes et. al.), and excessive use can lead to negative consequences in personal and psychological life. Youth spent more time online to compensate for not being able to have in person interactions. Ruckwongpatar et al., 2022, explored problematic internet use and increased issues in FoMO (fear of missing out), nomophobia, cyberchondria, and cyberbullying.

Nomophobia risk with Digital Media Use

Nomophobia is a new disorder related to digital media. It is classified as nervousness for not being able to communicate or connect with others, having immediate access to information and the fear of not having comfort provided by having a mobile device (Rodriguez Garcia et. al., 2020). According to Rodriguez Garcia et. al., 2020, nomophobia can increase the development of mental disorders and cause problems with self esteem, loneliness and happiness. A study by Jahrami et. al., 2022, found that mild nomophobia was prevalent in 25.8% of the study population, moderate nomophobia was prevalent in 52.4% and severe nomophobia was prevalent in 20.4%. These findings were all statistically significant meaning that adolescents are becoming more attached to their digital media/technology.

Risk of FoMO with Digital Media Use

FoMO is a term used to describe the perception of missing out on something which is then followed by compulsive behavior in order to maintain social connections (Gupta et. al., 2021). FoMO is a type of problematic attachment to social media which can lead to various negative consequences such as emotional tension, anxiety and lack of sleep (Gupta et. al., 2021). A research study by Alt, 2015, specifically focusing on adolescents and social media use, found that around 80% of adolescents report experiencing FoMO to some extent. This is a significant amount which suggests that adolescents are becoming more attached to their digital devices.

Cyberchondria risk with Digital Media Use

Cyberchondria is a phenomenon in which someone repeatedly searches medical information on the internet that leads to concerns about physical health (Mathes et. al., 2018). This can become an issue because people can become focused on searching their physical symptoms online and diagnosing themselves with various illnesses/diseases, leading to increased health anxiety (Mathes et. al., 2018). There are very limited studies on cyberchondria prevalence in adolescents, but there was a study by White et. al, 2009b, who surveyed 515 young adults in which about 60% of respondents reported interruptions to their online and offline activities as a result of worrying health searches.

Risk of Problematic Internet Use with Digital Media Use

Problematic Internet Use (PIU) is characterized as a fixation with internet use, including an inability to resist spending time online, leading to considerable distress (Aboujaoude, 2010). PIU can have significant implications for individuals' psychological

well-being and personal lives. PIU can manifest in excessive amounts of time on specific online activities like gaming or shopping (Ruckwongpatr et al., 2022). PIU can be worsened when in combination with various psychological disorders, such as ADHD, depression, anxiety and PTSD. A study by Tang et. al., 2013, found that the prevalence rate of internet addiction (PIU) in adolescents was 6%.

Internet gaming disorder (IGD) is when an individual exhibits persistent and recurrent gaming behaviors that lead to significant impairment or distress in their daily lives, and the gaming takes precedence over other interests and other daily activities (World Health Organization, 2019). Research shows gender disparities in terms of prevalence of IGD, with higher prevalence rates in males compared to females (Ruckwongpatr et. al., 2022). For example, a study by Kuss et. al., 2012, found that males tend to exhibit more severe symptoms of IGD, such as more time spent gaming and more negative consequences. An individual's dependency on gaming is what eventually leads to negative consequences which in turn require the individual to seek professional treatment (Kuss et. al., 2012).

Digital Media Use in Youth with Psychiatric Illness

Youth with mental health conditions such as ADHD (attention deficit hyperactivity disorder), ASD (autism spectrum disorder), and schizophrenia may be especially vulnerable to developing problematic internet use and other forms of problematic media use, such as cyberbullying. (Ruckwongpatr et. al, 2022). This association has also been seen with depression (Lin et. al, 2016), PTSD (Hambley, 2007) and anxiety (Hoge et. al., 2017).

ADHD

ADHD, also known as Attention Deficit Hyperactive Disorder is a neurodevelopmental disorder that is characterized by behaviors of inattention, hyperactivity, and impulsive actions that have a significant effect on the individual's day to day functioning and development (Furman et. al., 2005). Individuals with ADHD have difficulty sustaining attention for prolonged periods of time and are often forgetful about their tasks. Individuals may also find it difficult to remain still or seated during appropriate events and often act before thinking about the potential consequences. ADHD diagnosis and symptoms typically occurs at the beginning of childhood and presents in an array of spectrum. ADHD can co-occur with other mental health issues such as anxiety, mood disorders, obsessive-compulsive disorder, and addictive disorders (Furman et. al., 2005).

According to Settanni et al. 2018, who researched the relationship between adolescents with ADHD and Facebook use, adolescents with ADHD symptoms are more likely to develop addiction to social media or internet-related addictive behaviors when compared to their peers without ADHD symptoms (Settanni et al. 2018). ADHD symptoms and sleep disturbances are often associated as individuals with ADHD have slower sleep duration, daytime sleepiness, or other sleep-related issues. Individuals who use their social media for excessive amounts of time during the night have been linked to increased risk of sleep problems (Dekkers & Hoorn, 2022).

It has been speculated that social media may be particularly enticing for adolescents with ADHD (Boer et al., 2019). From its pop-up notifications to its multitasking features, social media can be a distraction and allows for instant gratification that can be appealing for individuals with ADHD who are already sensitive to distractions in their environment (Boer, et al., 2019). The ability for adolescents to switch easily between multiple social media platforms may exacerbate further existing attentional issues in youth with ADHD (Boer, et al., 2019). Many platforms incentivize constant engagement, prompting users to constantly check for incoming messages or acquaintances' posts on their cellular devices, even in environments that do not encourage cell phone use such as schools (Boer et al., 2019).

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is another neurodevelopmental disorder that encompasses various levels of impairment and can affect experiences involving communication, social interaction, or behavior regulation (Alhujaili et al., 2022). ASD is often diagnosed during childhood and is characterized by repetitive or restrictive patterns, activities, interests, or behaviors (Alhujaili et al., 2022). Individuals with ASD may have difficulty remaining in eye contact, present repetitive movements, are not welcoming to changes around their environment, and have intense interest in specific topics. One study looked at the differences in internet and digital media use between children with and without ASD. It was found that those in the ASD group indicated longer times using the internet or digital media than their non ASD peers (Kawabe et al., 2020).

Another study by Alhujaili et al., 2022, compared social media use between adolescents with and without ASD, and concluded that there was no significant difference in the usage of social media between the two groups, but that the reasons teenagers with ASD reported using social media differed from their neurotypical peers. For example, adolescents with ASD preferred YouTube compared to their non-ASD peers who prefer other social media platforms that center around social interaction (Boer et al., 2022).

Depression

Depression is a mental health disorder characterized by persistent feelings of hopelessness, difficulty making decisions, sleep-related issues, loss of interest in activities previously enjoyed, fatigue, and thoughts of self-harm or suicide (Sawchuk, 2022). Like other mental health conditions, depression can be episodic and range from mild to severe in terms of severity. There appears to be a relationship between adolescent depression and social media use, but it is likely a complex relationship (Lin et. al, 2016). It is unclear whether social media use increases for youth with depression because it is a coping mechanism to manage psychiatric symptoms, or whether social media use itself exacerbates depression symptoms due to social comparison (Lin et. al, 2016). Social comparison is defined by the term social comparison theory which states that people evaluate their abilities and attitudes in comparison to others which has a significant impact on self image (American Psychological Association, n.d.; Merriam-Webster, n.d.)

According to a scoping review of research on the relationship between social media use and depressive symptoms, females were more likely to report higher

depressive symptoms with increased social media usage due to appearance-related content compared to male adolescents. Additionally, the correlation between social media use and depression appears stronger for younger adolescents (Azem et. al., 2023).

A systematic review by Kerel et. al, (2019) studied the influence of social media on depression and other mental health issues in adolescents. Although the findings give complex relationships between social media use and depression symptoms, they were able to measure social media usage in terms of time spent online, activity, investment, and addiction. For each of those categories, there were multiple studies that showed a positive correlation between time spent online, activity, investment and addiction and depressive symptoms in adolescents.

In another systematic review by Liu et. al, (2022) that looked at the association between time spent on social media and depression symptoms, they included multiple studies on the relationship between time spent on social media and depressive symptoms in adolescents from different regions (eg., Europe, Asia, Australia), and different age ranges (11 to 19 years old). The review also concluded that there may be a connection between increased risk of depression and a greater amount of time spent daily on social media. Although this relationship existed for both male and female adolescents, the association was stronger in female adolescents. This gender difference may occur due to female adolescents spending more time on social media due to fear of missing out or due to experiencing cyberbullying. This then can create a vulnerable environment for female adolescents and result in an increased risk for depression Liu et. al, (2022).

Anxiety Disorders

Anxiety is an evolutionary response to perceived threats and stress. However, if these feelings become excessive and uncontrollable, they can affect a person's quality of life, and represent an anxiety disorder (Himanshu, 2020). There are different types of anxiety disorders, including general anxiety disorder, phobias, social anxiety disorder, and panic disorder (Himanshu, 2020). According to Hoge et. al., 2017, it has been reported that some people will overuse the internet in order to avoid negative emotions like anxiety. For those with social anxiety disorder specifically, they might prefer texting, emailing or instant messaging instead of in person interactions. This coping mechanism can become reinforced over time, leading to increased avoidance and worsening symptoms of social anxiety disorder (Hoge et. al., 2017).

Post-Traumatic Stress Disorder

Post-traumatic stress disorder, or PTSD, is a mental health condition which can be triggered from experiencing traumatic events or witnessing traumatic events. Many individuals with PTSD may have experienced traumatic events such as a car accident, natural disasters, or assaults (Hamblen, 2007). PTSD is grouped into four categories of: intrusive moments (eg, recurrent unwarranted memories of the event), avoidance (eg, avoiding places/people that remind them of the trauma), negative changes in thinking/mood (eg, hopelessness about themselves or the future), and changes in physical and emotional reaction (eg, easily frightened) (Hamblen, 2008). PTSD in adolescents

tends to manifest in changes in arousal and reactivity including irritability, trouble concentrating, self-destructive behavior and anger outbursts, (Hamblem, 2007).

According to Contractor et al., 2017, PTSD can share common risk factors with problematic/addictive smartphone use, such as low self esteem and neuroticism. Social media can either worsen or alleviate PTSD symptoms. For example, some negative effects of social media on adolescents with PTSD that could worsen symptoms are cyberbullying, social isolation, sleep disturbances, and other negative interactions with peers or strangers. Some positive effects of social media on adolescents with PTSD that could alleviate symptoms include supportive networks, access to information, and a chance to freely self-express themselves (Contractor et al., 2017).

Adolescents with PTSD are more likely to engage with strangers online compared to their peers without PTSD, which may be due to seeking a social connection or coping with trauma related distress (Ruggiero et. Al., 2011).

Research by Zweig et. al., 2013, found that those with PTSD are more likely to engage in sexting compared to peers without PTSD. This could potentially be due to those with PTSD having difficulties managing social relationships and seeking validation online.

Adolescents with PTSD are also more vulnerable to cyberbullying due to emotional dysregulation and heightened reactivity to stressors (Kowalski et. al., 2014). These symptoms can make them more susceptible to harassment online. Kowalski et. al., 2014, also found that those with PTSD struggle more with setting boundaries and managing interpersonal conflicts which can increase the chance of victimization.

Current Study

Although there is extensive information about consequences from adolescent digital media use, there are few studies that explore the role of digital media in psychiatric hospitalizations and presentations. In the last decade, the rising rates of suicide and suicide attempts, along with other mental health issues, have been particularly noted in the youth population. According to Santo et al., 2023, the increase in pediatric emergency department (ED) visits have been more related to mental health reasons than due to physical reasons. Data from the Pediatric Health Information System, from 2015 to 2020 and including data from 49 U.S. children's hospitals, showed an annual increase of 8.0% in ED visits related to mental health, in contrast to a 1.5% increase in all other visits (Santo et al., 2023). Likewise, an analysis of Nationwide Emergency Department Sample data from 2007 to 2016 showed a significant 60% increase in pediatric visits for mental health disorders throughout the decade (Santo et. al, 2023). According to the World Health Organization, approximately 10-20% of adolescents experience mental health issues worldwide (WHO, 2020). Untreated mental health issues can lead to other problems such as increased risk of substance abuse and suicide (Kessler et al., 2007). Mental health problems in adolescents have been increasing for over a decade, with an even greater increase during the pandemic (Schweizer et. al., 2023). After the covid pandemic, it has been reported that child and adolescent anxiety and depression levels have doubled compared to pre pandemic_(Felfe et. al., 2023).

Some research studies exist that examine how digital media-related conflicts might impact psychiatric hospitalization. Nesi et. al., 2022, found that digital media

related hospitalizations were common with 42.9% of their sample size reporting conflict. The greatest issue reported (24.8% of sample) was having a phone taken away, with other issues such as suicide related conflict on social media (19% of sample), and 14% of the sample reported peer relationship problems on social media (Nesi, et. al., 2022).

A prior study by Gansner, et. al., 2019, found that in a sample of 240 youth, nearly a third reported that their psychiatric hospitalization was related to digital media use. Adolescents admitted for digital media related complaints were more likely to use social networking, but they did not appear to have greater use of texting or internet use per day. It was also found that the individuals with digital media related admissions were more likely to have been cyberbullied and engage in sexting (Gansner, et. al., 2019). The article by Gansner et. al., 2019, stated that adolescents with digital media related admissions were not at increased risk of recent depression. This study aimed to determine the relationship between digital media related crises and psychiatric crises, finding that those with depression were more likely to experience digital media related conflict, which could be due to the increased sample size compared to previous research.

Research indicates that conditions such as depression, anxiety disorders, and PTSD can contribute to behaviors such as PIU, cyberbullying and internet gaming addiction. For example, studies by Moreno et al. 2011, and Cookingham et. al., 2015, highlight how youth with mental health issues may use the internet as a coping mechanism or to seek social support, which in turn increases their chance of online risky behavior. We know that there is a relationship between many psychiatric disorders and different types of digital media behavior and that there is general research that suggests

individuals with various mental health conditions may be more likely to engage in risky online behaviors, but we do not have an understanding of how different types of high risk digital media use differ between various psychiatric illnesses.

There is also previous research on psychiatric crises related to digital media use and youth mental health related admissions, but there is little descriptive research on psychiatric crises that may have been precipitated by digital media or electronic device use for youth who present to the Emergency Room in psychiatric crisis. This prompted this study to look at how digital media conflict plays a role, specifically in respect to youth admission to the ER for an issue precipitated by digital media conflict.

The aims/objectives of this study are as follows:

Aim 1: Characterize digital media and electronic device related psychiatric crises resulting in emergency room presentation in youth aged 6-18 by:

- A: Determining the incidence of digital media/electronic device related psychiatric crises. There are few studies that examine the incidence of digital media or electronic device related psychiatric crises and none to our knowledge that take place in the Emergency Room, so based on prior studies (Gansner et. al., 2019; Nesi et. al., 2022) we expect to find that 10-20% of ER admissions will be related to digital media/electronic devices.
- B: Determining relationships between digital media and electronic device related psychiatric crises and demographic variables and psychiatric diagnoses. We expect that age will positively correlate with psychiatric

crises due to digital media. We also expect that youth with neurodevelopmental diagnoses like ADHD or ASD will be significantly more likely to present with digital media related.

- C: Characterizing the frequency of specific categories of digital media and electronic related psychiatric crises. Based on prior research by Gansner et. al., 2019, we anticipate that interpersonal conflict will be the most frequent conflict of digital media psychiatric crises.

METHODS

For this study, all psychiatric consultation notes from youth aged 6-18, who had gone to a local hospital emergency room in a psychiatric crisis were reviewed for the entirety of 2022. Consultation notes were accessed through the hospital system's electronic medical record.

For each consult, demographic data was collected on the patient including. For gender, both chart-identified and patient-identified gender were recorded, with the chart-identified gender being the gender listed in their chart and patient-identified gender being how the patient identifies during the psychiatric encounter. Prior psychiatric diagnoses were also recorded.

For the encounter to be considered digital media-related, the initial psychiatric encounter note had to document currently active psychiatric symptoms resulting from one of the following circumstances: separation from devices/digital media/internet, interpersonal conflict online, visualizing distressing content online, or high risk online behaviors. Examples of separation from devices/digital media are loss of gaming device, internet access, laptop, smartphone or specific digital media application like Tiktok or Youtube. Resulting behaviors from this separation include aggression towards others or to self, suicidal ideation, homicidal ideation. Online interpersonal conflicts consist of scenarios like cyberbullying or getting into an argument with another individual online. Visualizing distressing content online consists of exposure to distressing/triggering text posted online and viewing distressing/triggering video or social media content. High risk online behavior encompassed actions such as posting homicidal ideation online or other

threatening online behavior, posting suicidal ideation or other self injurious intent online, sexting, online relationship with an adult, purchasing drugs online or involvement with extremist or violent content online. Each of these categories of digital media-related admissions was coded numerically from 0-4.

Table 1:

	Separation from devices/digital media
Examples	<ul style="list-style-type: none"> • Loss of gaming device • Loss of internet access • Loss of laptop, smartphone or specific digital media application like TikTok or Youtube
	Online interpersonal conflicts
Examples	<ul style="list-style-type: none"> • Cyberbullying • Getting into an argument with another individual online
	Visualizing distressing content online
Examples	<ul style="list-style-type: none"> • Exposure to a distressing/triggering text posted online • Viewing a distressing/triggering video or social media content
	High risk online behavior

Examples	<ul style="list-style-type: none"> • Posting homicidal ideation online or threatening online behavior • Posting suicidal ideation or other self injurious intent online • Sexting • Online relationship with an adult • Purchasing drugs online • Involvement with extremist or violent content online
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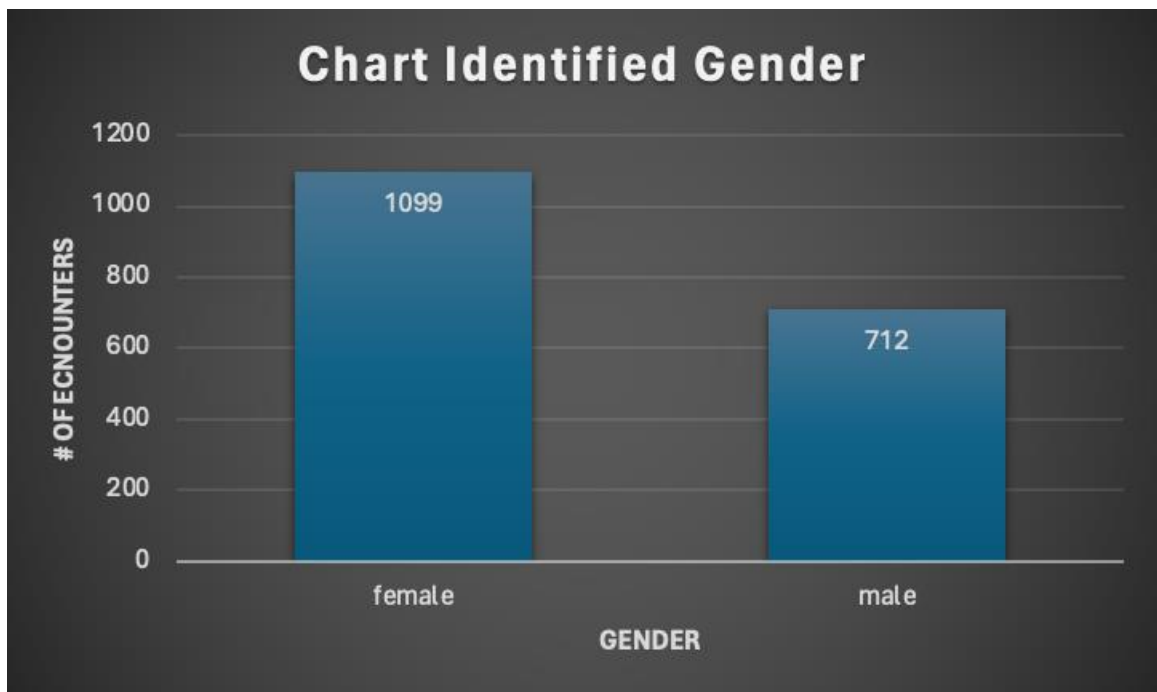
Before starting the coding, study team members examined sample presentations and coded them using the data collection tool. This allowed the team to ensure appropriate understanding of how to identify the required information when coding. For the first month of data collection, study team members reviewed digital media/device-related psychiatric admissions with the research team during a weekly research meeting, to ensure consensus on coding the correct type of digital media/device-related admissions. If there were any disagreements or concerns, they were discussed during this meeting and a resolution was made.

In terms of statistical analyses, descriptive statistics of the sample were calculated as percentages. Logistic regression models were used to assess relationships between the primary study outcome (digital media/electronic device-related psychiatric crisis designation) and dependent variables. Age, gender, race/ethnicity were controlled for when assessing relationships between psychiatric diagnoses/past psychiatric history and outcomes of interest. Linear regression was also used to assess age and digital media presentation while adjusting for race and gender.

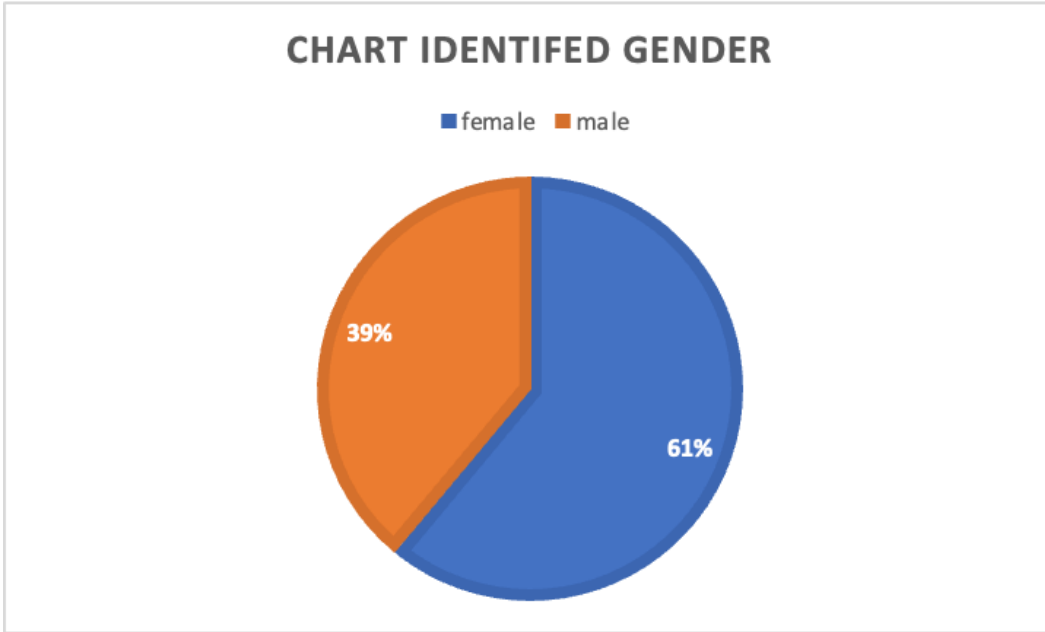
RESULTS

There were a total of 1811 consults reviewed during this study with the average age being 13.29 years old. When examining the data categorized by chart-identified gender, it was found that 1099 encounters included an individual that identified as female, making up 61% of the sample, while 712 encounters included individuals who identified as male, comprising 39%. Similarly, for patient-identified gender, the breakdown showed 920 encounters identifying as female (51%), 692 encounters identifying as male (38%), 68 encounters with individuals identifying as transgender (3.76%), and 130 encounters with individuals identifying as non-binary (7.2%) who were included within the study.

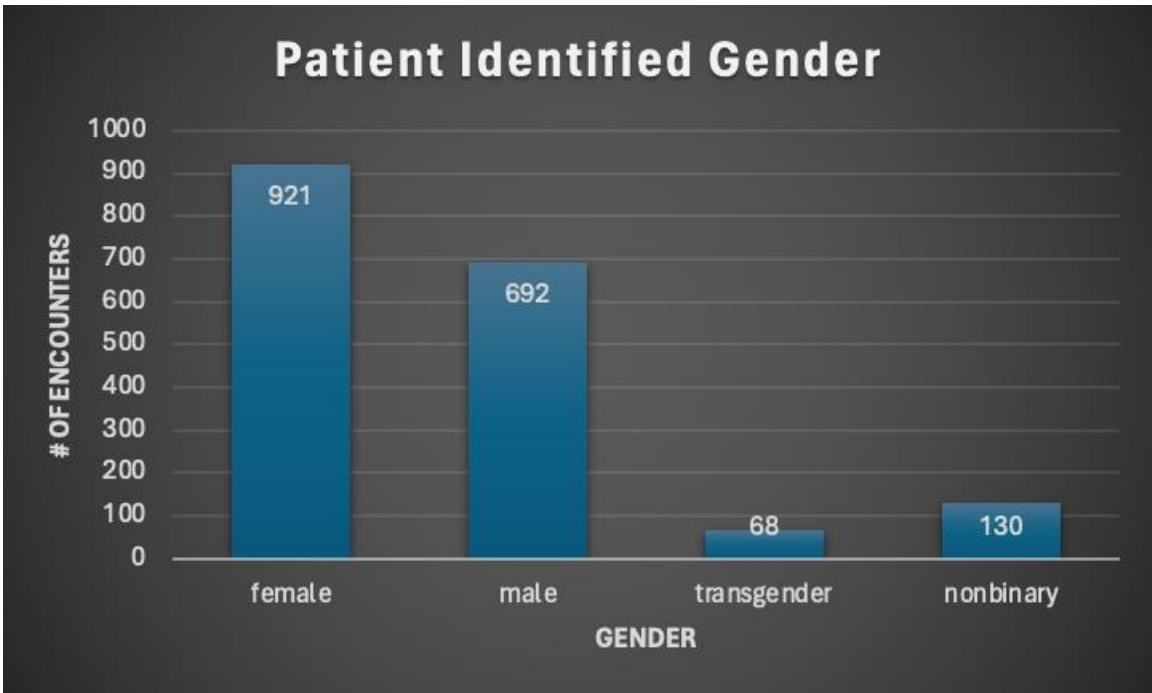
Graph 1:



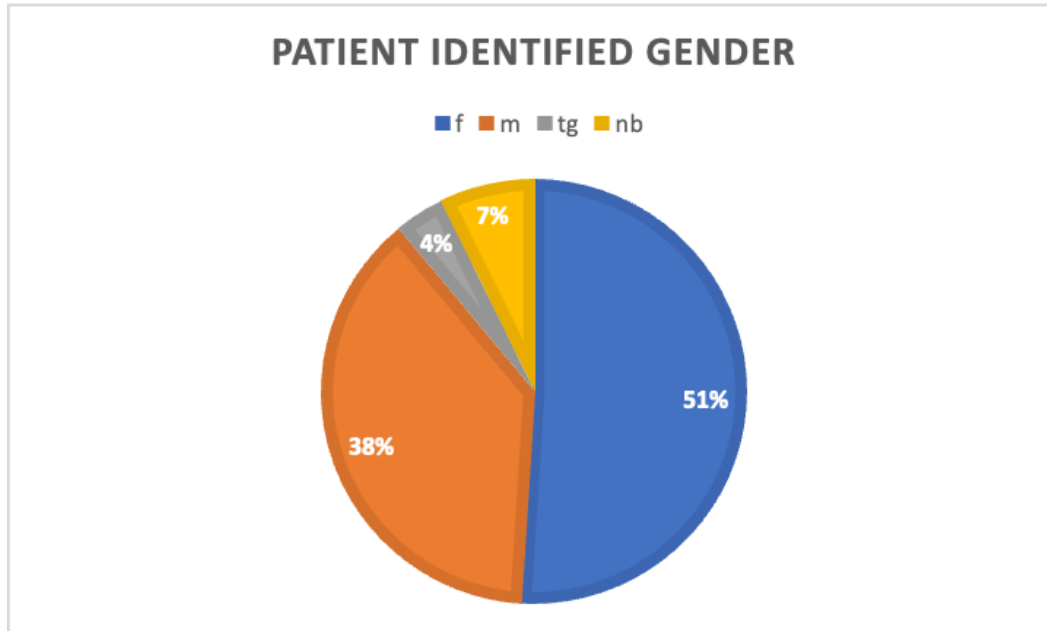
Graph 2:



Graph: 3

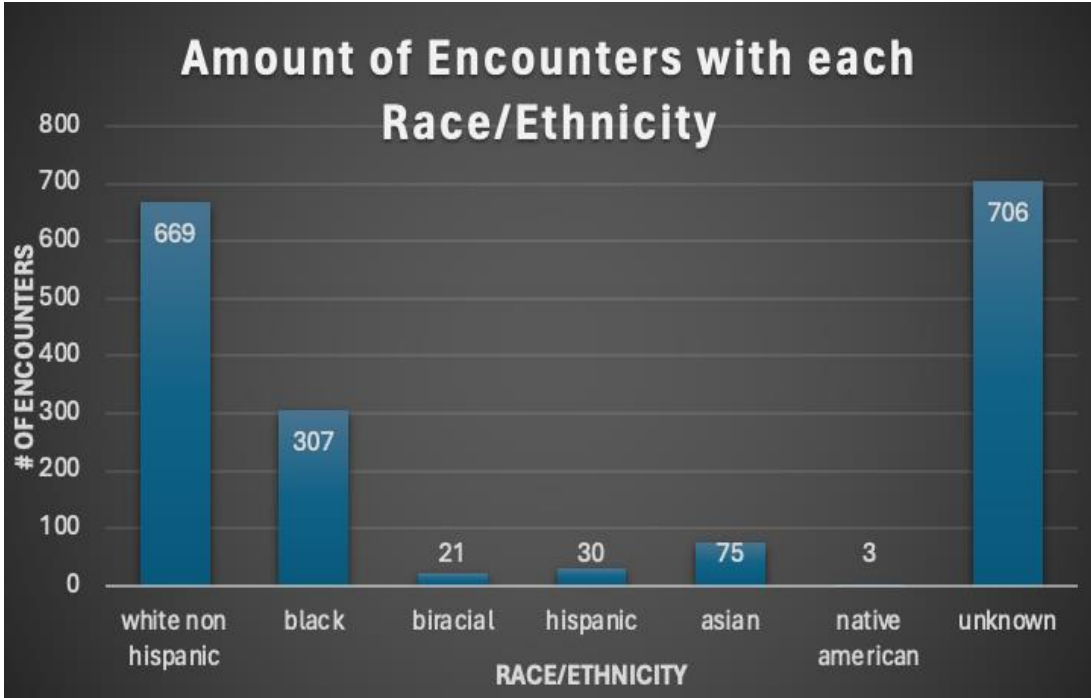


Graph 4:



The study included various demographics in terms of racial categories. 669 encounters had someone who identified as non-Hispanic white, representing 37% of the sample, while 307 encounters identified as Black, comprising 17%. Additionally, there were 21 encounters who identified as biracial (1.16%), 30 as Hispanic (1.65%), 75 as Asian (4.14%), and 3 as Native American (0.17%). There were 706 encounters (39%), which fell under the category of unknown race.

Graph 5:



Graph 6:

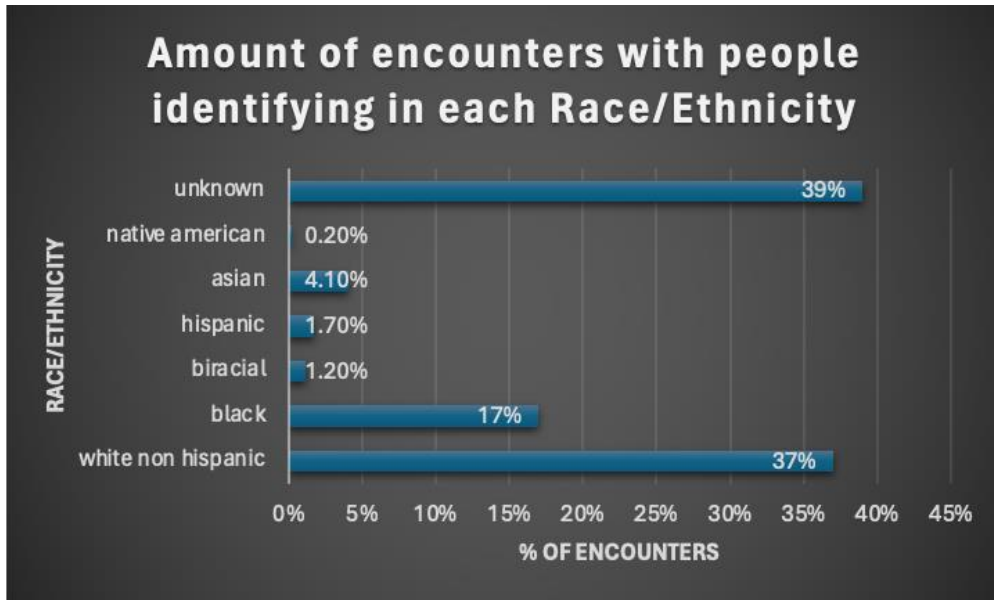


Table 2

Gender	# of encounters
Female	921
Male	692
Transgender	68
Non Binary	130

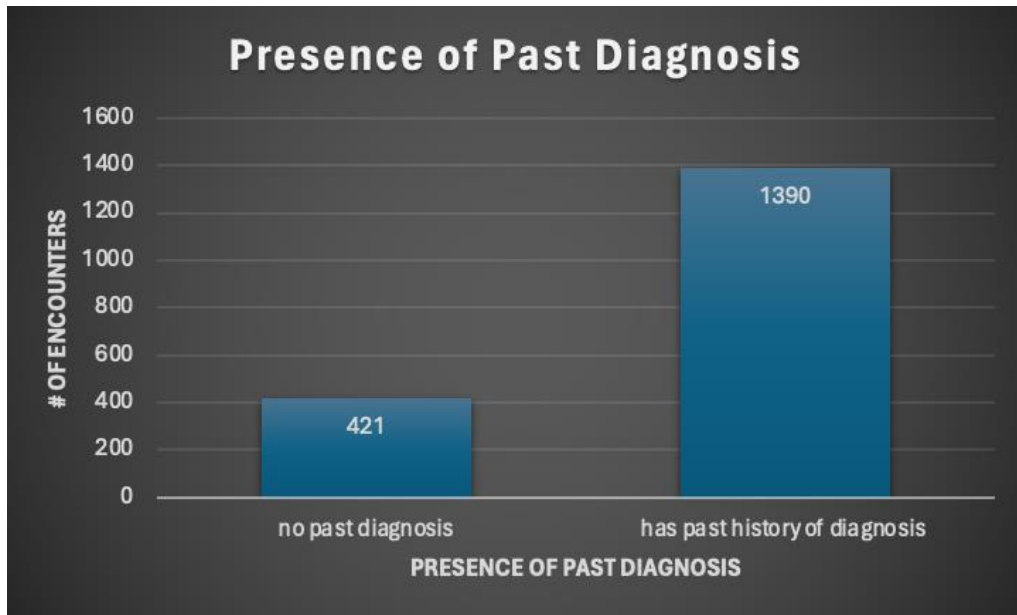
Table 3

Race/Ethnicity	# of encounters
Non Hispanic White	669
Black	307
Biracial	21
Hispanic	30
Asian	76
Native American	3
Unknown	706

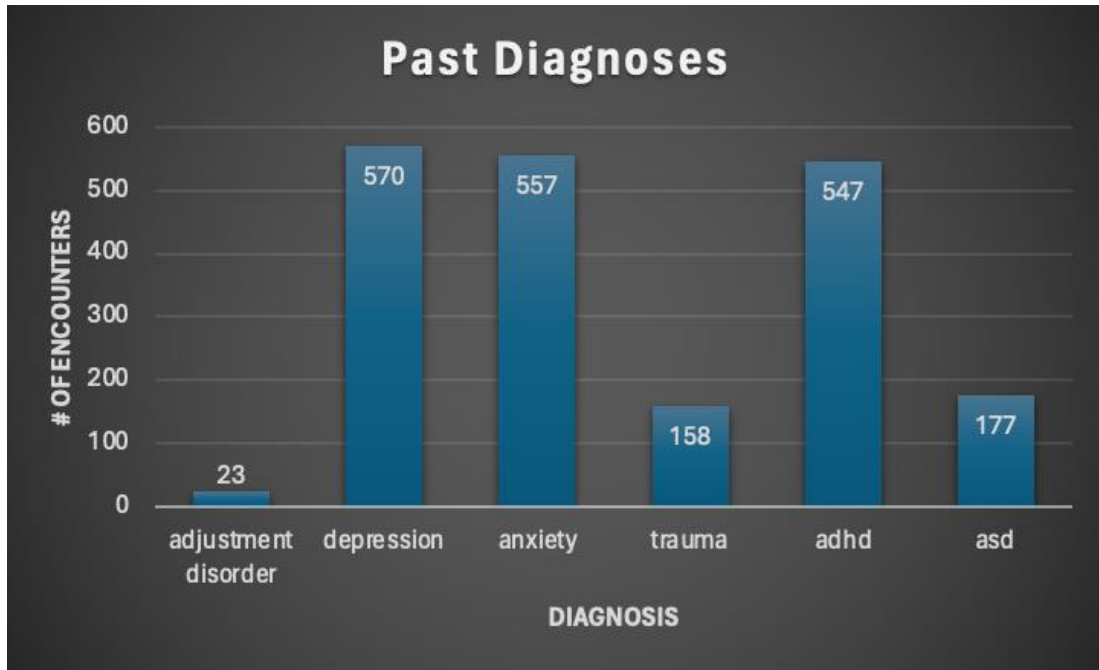
The majority of encounters (77%) involved youth with a history of prior psychiatric diagnoses. Concerning the prevalence of prior psychiatric disorders, 23 encounters reported (1.1%) being diagnosed with adjustment disorder, 570 (28%) with depression, 557 (27%) with anxiety, 158 (7.8%) with trauma, 547 (27%) with ADHD, and 177 (8.7%) with ASD. Encounter diagnoses were also recorded, and 193 encounters (7.2%) with someone who identified as being diagnosed with adjustment disorder, 950

(35%) with depression, 670 (25%) with anxiety, 247 (9.2%) with trauma, 467 (17%) with ADHD, and 156 (5.8%) with ASD.

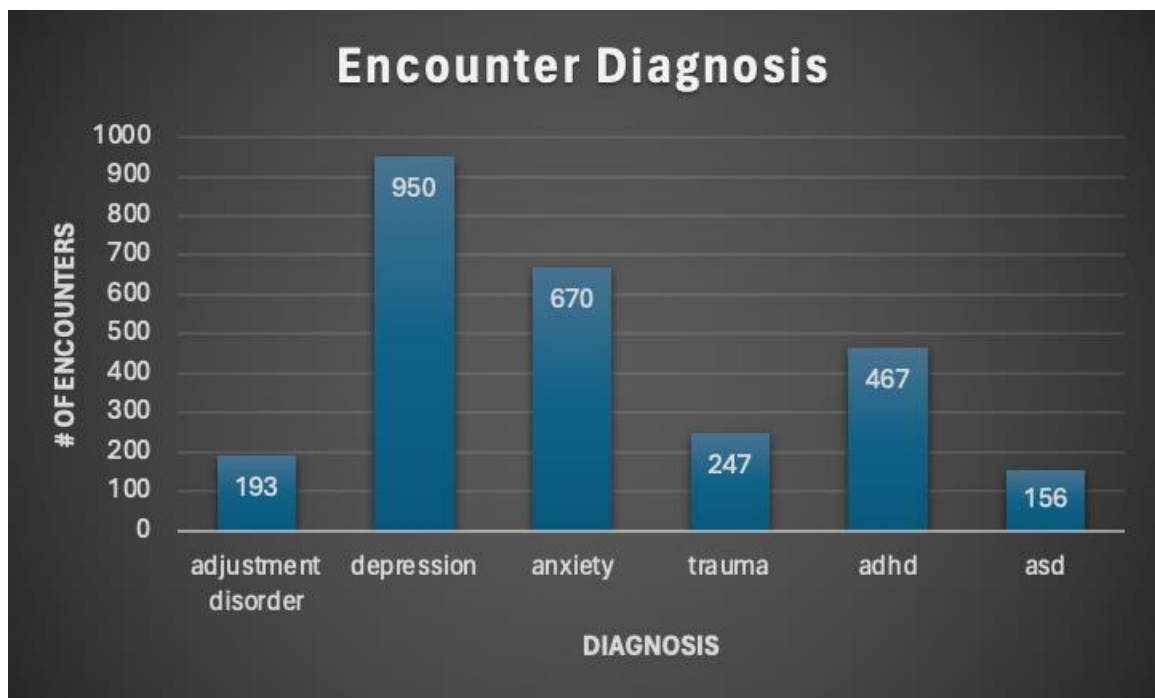
Graph 7:



Graph 8:

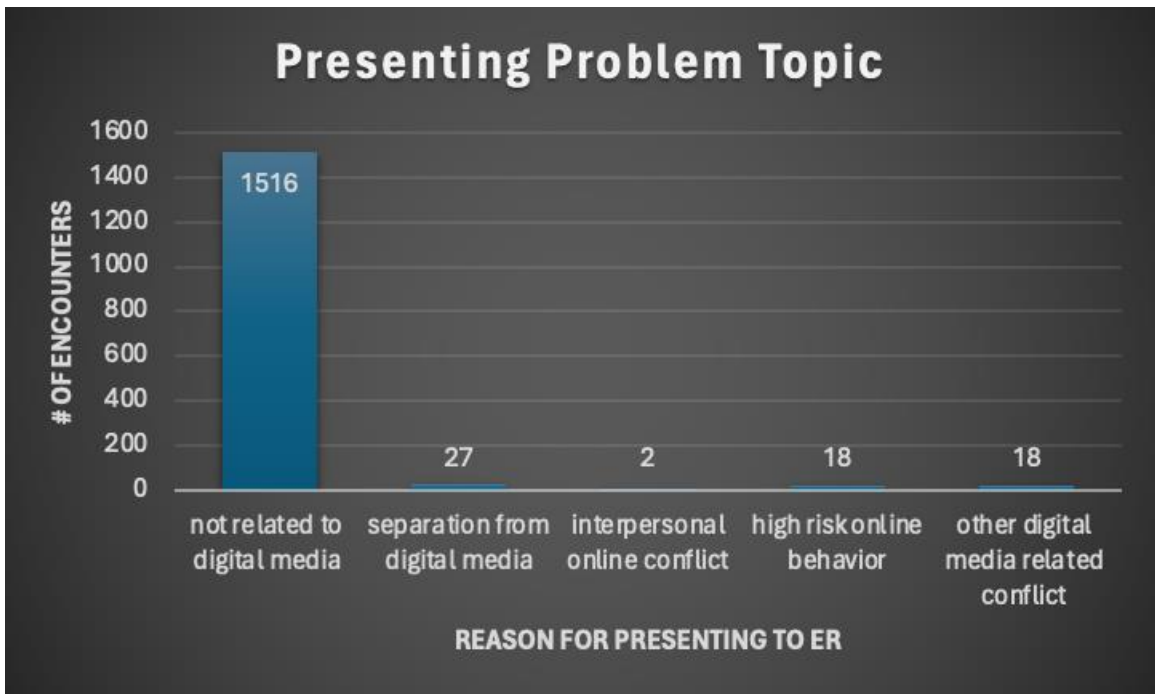


Graph 9:

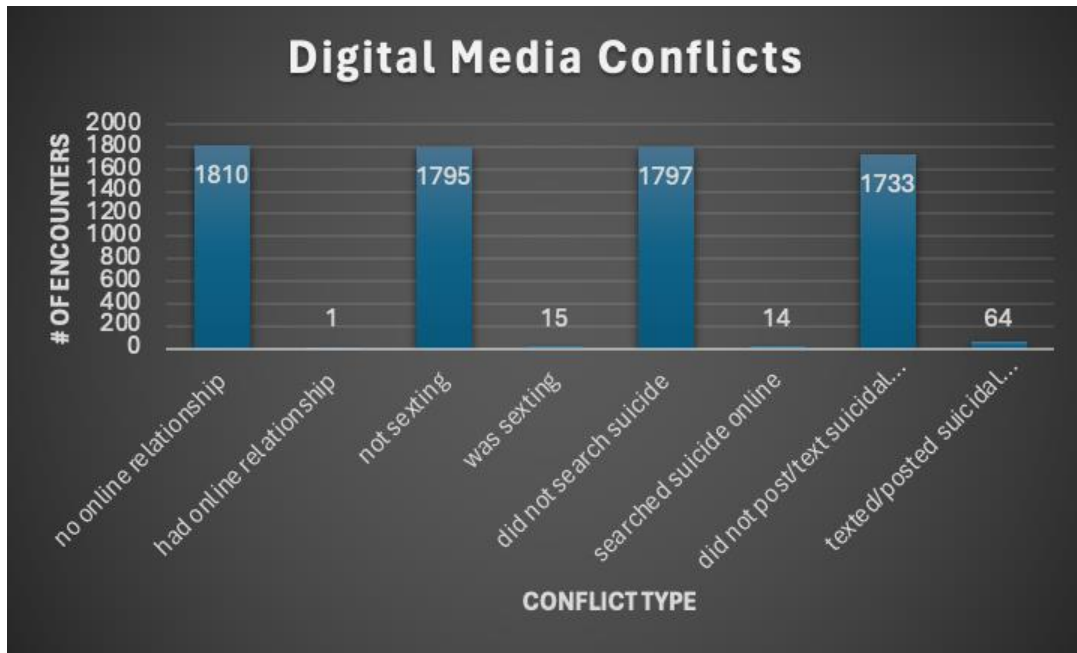


Regarding digital media-related admissions, the majority of encounters (96%) were not coded as digital media-related admissions. Of those encounters that were related to digital media, (65 encounters), 27 (41.5%) had someone that experienced dysregulation upon separation from their device, while 2 (3%) had someone who reported interpersonal conflicts within online interactions. Additionally, 18 encounters (28%) included individuals that displayed high-risk behaviors online, while another 18 encounters (28%) encountered other forms of conflict related to digital media.

Graph 10:



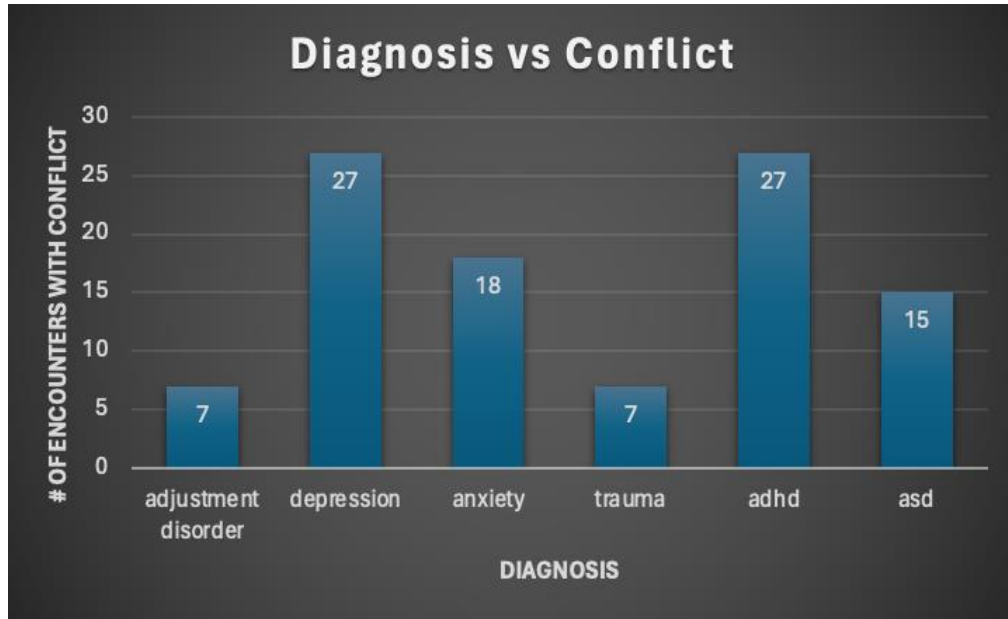
Graph 11:



In terms of high-risk digital behaviors, only one encounter was related to an inappropriate online relationship with an adult, while 15 encounters were related to sexting, 14 individuals admitted to searching for information related to suicide online and 64 patients disclosed that they had either texted someone or posted on social media about their suicidal ideation or plans.

Among the patients who experienced conflicts related to digital media, the following distribution was found: 7 encounters with individuals who were diagnosed with adjustment disorder, 27 with depression, 18 with anxiety, 7 with trauma, 27 with ADHD, and 15 with ASD.

Graph 12:



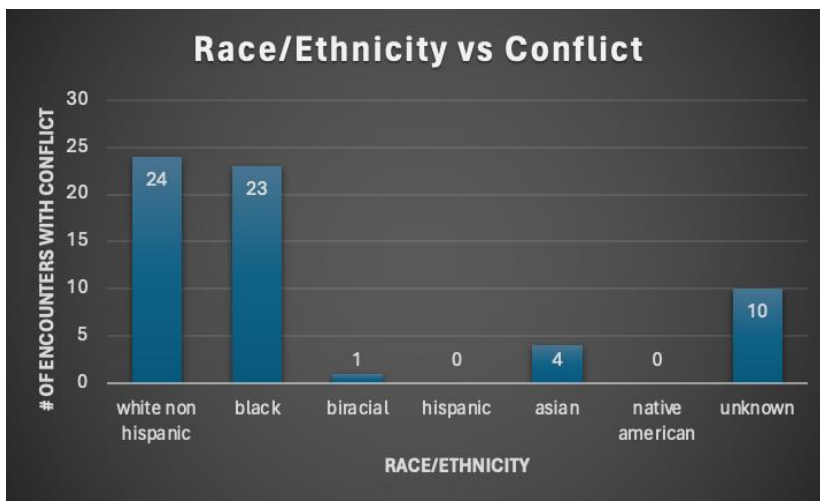
Comparing race of individuals with digital media-related encounters, 24 encounters included someone who identified as non hispanic white, 23 as black, 1 as biracial, 0 as hispanic, 4 as asian, 0 as native american and 10 as unknown race.

The association between race and conflicts associated with digital media was also explored. The analysis revealed that among those who reported digital media-related conflicts (62 encounters), 24 encounters (39%) included individuals who identified as non-Hispanic white, 23 (37%) as Black, 1 (1.6%) as biracial, 4 (6.5%) as Asian, and 10 (16%) were of unknown race. Notably, no encounters had individuals of Hispanic or Native American descent reported conflicts related to digital media.

When looking at the number of encounters of each race/ethnicity and then the number of digital media related conflicts within each of those racial/ethnic groups, we found that there were 669 encounters with individuals identifying as non hispanic white and 24

(3.6%) of them had a DM related conflict, 307 encounters with individuals identifying as black and 23 (7.5%) had a DM related conflict, 21 encounters with individuals identifying as biracial and 1 (4.76%) had a DM related conflict, 75 encounters with individuals identifying as asian and 4 (5.33%) had a DM related conflict. There were also 30 encounters with individuals identifying as hispanic in which none had a DM related conflict as well as 3 encounters with individuals identifying as native american who also had no reported DM related conflict. A study by Vogels, 2022, found that a teens racial/ethnic background is related to whether or not they report being cyberbullied. She found that about 21% of Black teens reported being a target due to their race/ethnicity which can be compared to 11% of hispanic teens and 4% of white teens. This is a potential factor explaining why black teens were more likely to have a digital media conflict, as cyberbullying fits into that category.

Graph 13:



The association between gender and conflicts associated with digital media was analyzed and the findings revealed that among those encounters, 19 were female, 36 were male, 3 identified as transgender, and 4 identified as nonbinary.

Graph 14:



Through the statistical analysis, it was found that age exhibits a statistically significant correlation with digital media (DM) conflicts, even when accounting for variables such as race and gender. This observation was substantiated by a p-value below 0.05, indicating that age is positively correlated with the likelihood of a dm-related conflict.

Analysis by linear regression revealed that age, when race and gender were adjusted for, has a statistically significant effect on DM related conflict, with a p value of

0.001. After analysis of encounters with transgender and non transgender youth, it was found that patients who identified as transgender were associated with significantly greater odds of having a DM-related presentation, with a p value of 0.007 and odds ratio of 2.1. Identifying as non binary was found to be associated with a decreased risk of having a DM related conflict, with a p value of 0.025 and odds ratio of 0.51. Among specific psychiatric diagnoses, individuals with depressive disorders were found to have a higher probability of encountering DM-related conflicts, with an odds ratio of 1.42 and p value of 0.01.

Presence of a past psychiatric history was not found to be related to likelihood of DM-related conflicts (p value 0.86). It was found that being female had no statistically significant effect on DM related conflict. The presence of anxiety disorders, trauma-related disorders, attention deficit hyperactivity disorder (ADHD), and autism spectrum disorder (ASD) did not exhibit statistically significant effects on DM conflicts.

DISCUSSION

The effect of digital media on ER admissions has not been greatly studied. The purpose of this study was to determine the associations and relationships between those that were seen in the ER with race, age, gender, past psychiatric history and digital media related conflict. We expected that 10-20% of ER admissions would be related to digital media/electronic devices and we found that 256 of the 1772 (14%) encounters were related to digital media.

Types of digital media-related presentations

We hypothesized that interpersonal conflict would be the most frequent conflict of digital media psychiatric crises, but we found that the majority of those with a digital media conflict experienced dysregulation upon separation from their device (41.5%) with the second most common being tied for high risk online behaviors and other forms of online conflict (28%). It is becoming more common for adolescents to rely on their devices and become attached. This makes it more likely that individuals will have issues involved with those devices. Electronic devices and digital media tend to be a primary entertainment source for children, which leads to their dependency on the devices in order to regulate emotions (Przybylski & Weinstein, 2017). Since devices serve as a support for many adolescents, when they are taken away or separated from their device, it can lead to symptoms of emotional distress.

Adolescents were also found to be involved in high risk online behaviors that lead to DM related conflicts. Cyberbullying is one of the biggest high risk behaviors and research indicates that victims are at an increased risk of developing depression, anxiety and suicidal ideation (Patchin & Hinduja, 2015). Another high risk online behavior is online predation where kids befriend individuals that are posing as their peers or friends but are actually out to harm them (Wolak et al., 2013).

Previous research by Gansner et. al., 2019, found that 68 of the 218 subjects (31.2%) in the study were found to have psychiatric admission related to digital media use. The most common type of digital media related admission was relational problems and the most common chief complaint was cyberbullying (Gansner et. al., 2019). 41.2% of the sample size with admission related to digital media was cyberbullied, 39.7% were involved with sexting, 33.8% with viewing pornography and 17.6% with PIU (Gansner et. al., 2019).

Demographic Characteristics Associated with Digital Media-Related Presentations

Multiple research articles looked at the role of gender differences in emotional dysregulation and digital media conflicts. Research has found that males tend to have higher rates of problematic internet use, while females are more likely to experience conflicts that are related to social media interactions and cyberbullying (Gioia et. al., 2021; Vigna-Taglianti et. al., 2017). Vigna-Taglianti et. al., 2017, did a study with 2022 students and found that 14.2% of males and 10.1% of females reported PIU. Females

tend to use social media platforms more than males, which can lead to risks such as negative online peer interactions (Moreno et. al., 2011).

Another article by Liu et al., 2023, discussed that there are gender related differences such as motivation and types of internet use that may play a role in how different genders are affected. Research has shown that adolescent males have a higher level of feeling depressed and report higher loss of control in terms of being able to reduce internet use (Liu et al., 2023). This indicates that there may be a relationship between the type of symptom and whether problematic internet use develops. Males are also more prone to engage in online activities that lead to excessive screen time and can contribute to conflicts related to gaming addiction or exposure to violent content (Liu et al., 2023). We also looked at the prevalence of digital media related conflict in transgender and non binary youth. We expected that both transgender and non binary youth would be more likely to be victims of digital media conflict as research by Gower et. al., 2019 and Russell et. al., 2018 found that transgender and non-binary youth often face increased risks of digital media conflict due to their increased chance of being victims of online harassment or discrimination. The research found that these youth are disproportionately targeted with regards to cyberbullying or exposure to online harmful content which can worsen mental health challenges. Our study found that this was the case for transgender youth, and they were found to have statistically greater odds of having a DM related presentation. We actually found the opposite for non binary youth, as being non binary was found to be associated with a decreased risk of having a DM

related conflict. This should be further studied, as there is no research, to our knowledge, that supports this finding.

Studies also suggest that age may play a role in digital media conflict. A study done in Japan by Nakayama et. al., 2020, revealed that 37.2% of 2 year olds and 50% of 3-5 year olds were using some type of digital media. The amount of kids that are using the internet has been increasing greatly, as technology becomes more ingrained in our society. In 2001, 49.2% of Japanese kids 6-12 years old used the internet, and that number increased to 82.6% in 2017 as well as 98.4% of 13-19 year olds (Nakayama et. al., 2020). With kids having this much access to technology and various social media platforms, it can become a lot easier for them to get involved with problematic internet use. We hypothesized that age would positively correlate with psychiatric crises and after analyzing the data in this study, it suggests that there is a statistically significant relationship between age and digital media related conflicts. As individuals got older, they were more likely to be involved with digital media conflict. This could be due to the fact that as kids age, they become more involved with digital media and technology, with more access to social media.

There is very limited research on the relationship between race and digital media related conflicts. A study by Jones et. al., 2009, discussed that there was a difference between race and computer ownership in students. It was found that white students (73%) were more likely to have a computer at home compared to black students (32.9%), even when income was adjusted for.

It was also found that white students were more likely to use the internet outside of the home compared to their black peers, but both hispanic and black non hispanic individuals were more likely to have started using the internet at school, compared to white students who started at home (Jones et. al., 2009). Despite those differences, Hispanic, Black non hispanic and white non hispanic students were found to have equally incorporated the internet into their personal and social lives (Jones et. al., 2009).

When we looked at the number of encounters of each race/ethnicity and then the number of digital media related conflicts within each of those racial/ethnic groups, it was found that the majority that had a digital media related conflict were black youth, with 7.5% of the black population having a conflict. This can be compared to 3.6% of the non hispanic white population, 4.76% of those who identified as biracial, 5.33% of asian encounters and 0% of hispanic and native american encounters. This shows that there was a larger portion of those who identified as black that had a dm related conflict. There is limited data about the association between race/ethnicity and digital media conflicts but this could potentially be due to the fact that black youth are more likely to be victims of racial discrimination through their digital media use. Research by Tynes et. al., 2019, looked at a sample of black and Latinx adolescents aged 11-19 years old and had them report their exposure to traumatic online events as well as any depressive or PTSD symptoms. An example of these traumatic online events are videos of police killings of unarmed citizens. The study found a significant association between exposure to traumatic events online and both PTSD and depressive symptoms (Tynes et. al., 2019). Since black youth are more likely to experience racial discrimination online, this

possibly explains why we found that black youth were more likely to have a digital media related conflict, which includes cyberbullying.

Psychiatric diagnoses comorbid with dm-related presentations

Although it was found that having a previous psychiatric history did not have a statistically significant effect on digital media conflicts, it was shown that specific diagnoses, like depression, were associated with a higher chance of having some type of digital media related conflict. This brings attention to different mental health conditions and their potential to increase individuals' vulnerability to being involved with digital media related conflicts. We hypothesized that youth with neurodevelopmental diagnoses like ADHD or ASD would be significantly more likely to present with digital media crises, but this was not the case. We found that the presence of ADHD or ASD did not exhibit statistically significant effects on DM conflicts. Instead, this study found that those with depressive disorders were found to have a higher probability of encountering DM-related conflicts. This can be seen in other research studies that show that those with online conflicts are more likely to have depression or other mental health concerns. Exposure to conflict or negativity online, such as cyberbullying, can impact an individuals' mental health (Van Ouytsel et al., 2016). This causes them to internalize negative emotions which then leads to increased depression (Wright, 2016). These feelings can become exacerbated as adolescents find it tough to disengage from online interactions.

For this study, there were 950 encounters that included a diagnosis of depression, which is greater than the number of encounters for other various disorders (193 with adjustment disorder, 670 with anxiety, 247 with trauma, 467 with ADHD and 157 with ASD). It is possible that depression, more than other diagnoses, might be more likely to be significantly associated with digital media related conflict due to depression being a more common disorder.

Limitations/future directions

There were a couple limitations that could be revised in a future study on this topic, with one limitation being geographic distribution of the sample. All of the individuals studied in this sample were those who presented to the same emergency department and lived in similar regional areas. This limits the generalizability of the results because the findings may not be representative of broader populations and digital media use and its associated conflicts can vary significantly across regions due to factors such as access to technology and social norms.

Another limitation of this study is the potential for recall bias. Recall bias is a systematic error that occurs when participants of a study do not remember previous experiences accurately or leave out details (Spencer et. al., 2017). This may occur because of our reliance on the children and their parents to report any digital media usage. Due to recall bias, they may not recall or might underreport digital media conflicts during their ER admission if it was something that they did not perceive as relevant.

Future research could use a more structured assessment of digital media use to try and lessen the effect of recall bias.

Future studies could focus on collecting a sample size from various hospitals in a variety of different geographical regions. Another limitation was the lack of a standardized method to incorporate digital media-related issues into an evaluation. This may have led to inconsistencies in the assessment across participants. While clinicians already perform comprehensive assessments, many were not asking the same questions in regards to demographics or digital media use. Future studies could explore the development of standardized measures or screening tools to facilitate the assessment of digital media-related issues in clinical settings without placing on the burden on clinicians to ask the questions during their assessment. Furthermore, this study relied on medical providers to document psychiatric diagnoses, conflicts, and patient gender, which may have introduced inaccuracies due to variations in documentation practices. Future research could implement more rigorous documentation protocols to ensure consistency and completeness in data collection, potentially enhancing the reliability and validity of the findings. Some questions that could be asked in future studies include:

- (1) How often do you use a digital device?
- (2) What type of activities do you engage in when using a digital device?
- (3) Do you ever experience conflict or negative interactions when using digital media? If so, provide examples

(4) How does digital media use affect your mood and overall well being?

Conclusion

It is important to study how digital media use might impact psychiatric ER visits for youth because recent research indicates a significant rise in mental health-related emergency department presentations among adolescents, and various studies showing that digital media-related conflicts potentially play a role in exacerbating these crises. This study showed that adolescents experiencing psychiatric crises in the emergency room frequently cite digital media-related issues such as online interpersonal conflicts, dysregulation upon separation from devices and engagement in high-risk online behaviors, as well as that those with depression were more likely to experience a digital media conflict. Future studies on this topic are needed that explore the relationships between different types of digital media use and various psychiatric diagnoses in youth who present to the ER. Additionally, future research should develop more standardized measures to better assess digital media related conflicts when youth present to the ER as well as further looking at regional and demographic differences in these presentations.

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Curriculum Vitae

