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"13 Reasons Why": An Analysis of Pediatric Psychiatric Visits Pre and Post Release of A Popular Netflix Show Detailing Pediatric Suicide

David Salo, Neeraja Kairam, Veronica Mekaeil, Leighanne K. Michel, Devansh Pandey, Dwhani Patel, Howard Bash, and Frederick Fiesseler

ABSTRACT

Background: **Among Americans, child suicide is the second leading cause of death between the ages of 10-24 years. The release of "13 Reasons Why" (www.netflix.com/title/80117470), one of the most popular Netflix series, has caused controversy as proponents feel it serves as a catalyst for conversation for issues people with mental illness face. On the other hand, opponents state it may sensationalize or glamorize suicide. We hypothesized that after the release of "13 Reasons Why" on March 31, 2017, there may be an increase in the numbers of patients between 10 and 20 years of age presenting to Emergency Departments (EDs) with the chief complaint of suicide attempt (SA), suicide ideation (SI), self-harming (SH) and other psychiatric complaints. We hypothesize that admission rates for psychiatric illness during this time would simultaneously be higher.**

Methods: **Retrospective cohort protocol comparing the number of presentations to 26 emergency departments in the Northeast and Southeast USA for a 60-day period before and after release of "13 Reasons Why". Data was collected from a proprietary electronic charting system and examined for the numbers of patients seen for SI/SA/SH and for all psychiatric evaluations, with a separate comparison for admission rates and age differences. We examined data from the matching time periods in 2016 to determine if there was a difference in 2017.**

Results: **3362 patients met criteria for the 120-day period in 2017. 1880 (56%) were female, mean age was 15.9 (95% CI 15.7-16.2), IRQ of 14-17. The number of patients seen in the 60-day post release period was 1799 vs 1563 prerelease (proportion of 0.54 (95%CI 0.52 to 0.56); p value <0.0001) representing a 15% increase post release. There was no significant change in presentations for chief complaints with regards to the combination of SI/SA/SH before (n 218) and after release (n 257) (p <0.08). There was no difference in overall admission rates before and after release (p <0.08) or in admission rates for those who had SI/SA/SH. There was no change in age before or after release: 16.5 years vs 16 years respectively, mean difference 0 (95% CI -0.4 to 0.7, p 0.65). There was a significant difference in total presentation for the 60-day pre vs the post March 31, 2017 time frame, however more patients presented in the pre March 31 period for 2016. While no change in admission rates or SI/SA/SH occurred, there was a 15% increase in overall psychiatric presentations to EDs after release of "13 Reasons Why".**

Discussion and Conclusion: **Although there was no increase in pediatric psychiatric visits specifically for SI/SA/SH after the release of "13 Reasons Why", there was a significant increase in overall psychiatric visits in the pediatric ED after the release of this series. This is in line with our theory that media, and in particular this television show, may have a profound influence on young patients with regards to serious mental health issues. Whether these numbers represent a positive vs negative effect on the psychiatric health of children is unknown.**

Keywords: "13 Reasons Why", pediatric suicide, self-harm, suicidal ideation.

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D. Salo
Emergency Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: dave.salo@gmail.com)
N. Kairam
Pediatric Emergency Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: hnkairam@yahoo.com)
V. Mekaeil*
Emergency Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: vmekaeil@gmail.com)
L. K. Michel
Emergency Department, Louisiana State University, Our Lady of the Lake Regional Medical Center, Baton Rouge, LA, USA.
(e-mail: lksherrow@gmail.com)
D. Pandey
Emergency Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: dpandeydo2022@gmail.com)
D. Patel
Pediatric Emergency Department, Inova Loudon Hospital, Leesburg, VA, USA.
(e-mail: pateldhwani922@gmail.com)
H. Bash
Psychiatry Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: howard.bash@atlantichealth.org)
F. Fiesseler
Emergency Department, Morristown Medical Center, Morristown, NJ, USA.
(e-mail: ffiesseler@yahoo.com)

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I. Introduction

The recent production and release of the controversial Netflix series "13 Reasons Why" has garnered tremendous media attention and captured the interest of many children, adolescents and adults alike. The show is focused on a young 17 year old girl who commits suicide, and through a series of 13 tapes posthumously explains why she chose to take her own life. Critics state the show sensationalizes, glamorizes, and makes suicide seem appealing. They state vulnerable adolescents watching the show may be influenced or romanticized by suicide and the powerful story told throughout the series.

Mental health professionals are concerned that after watching the show, that young adults may conclude that suicide is an easy way out, will get them the attention they want and lead to suicide contagion, or imitation. Proponents state that while adolescents are particularly vulnerable, the show allows for teachable moments while bringing awareness to cyber bullying, rape, abuse, assault and other issues that adolescents face.

Just after release, the show quickly became the most popular Netflix series ever watched at the time, with over 3.5 million social volume impressions the first week of release, giving it the biggest social presence out of any other original series or films according to social media company Fizziology [1]. Twitter's internal data, as reported by Variety, reports that "13 Reasons Why" was the most tweeted about streamed show of the year with over 11 million tweets from its release March 30 through April 21, 2017 [2]. (Note: Netflix does not release viewership data).

Since its release in March 2017, the show's social media presence substantially increased, which led to an almost constant conversation surrounding the show. Media coverage of suicide has been shown in the past to influence suicidal behavior in the general population [3]-[8]. With the media coverage that surrounded "13 Reasons Why", we hypothesized that the number of pediatric psychiatric presentations and presentations related to SI/SA/SH, to the ED would increase.

II. Methods

A. Study Design

This study was a retrospective chart review and comparison of pediatric psychiatric visits for 26 emergency departments in the northeast and southeast US 60 days prerelease vs 60 days post release of "13 Reasons Why"; with a comparison of data for the corresponding time period for the year 2016 to control month to month variability. Release date was March 31, 2017 (release date was excluded from pre and post data). The hospitals' institutional review board approved the study.

B. Study Setting and Population

The setting was a suburban hospital ED with an emergency medicine residency and pediatric fellowship program with a combined adult and pediatric annual volume of 85,000 patients. The total ED pediatric visits for all 26 hospitals included in the study was 356,525 for the 12-month period starting June 2016.

C. Study Protocol

A database for all psychiatric visits for children and adolescents to the 26 emergency departments was generated. Inclusion criteria included age 10-20 years with either a chief complaint of SI/SA/SH or any psychiatric illness identified by ICD-9/ICD-10 discharge diagnosis (the study straddled the implementation of ICD-9 to ICD-10, therefore both were used to collect data). The reason both chief complaints and ICD9/10 codes were simultaneously used to extract data was because there were patients who had suicidal ideation (SI), suicide attempt (SA) or overdose/self-harm (SH) in the chief complaint with no corresponding ICD-9/10 diagnosis related to suicide after psychiatric ED evaluation. Many of these patients would have had a final diagnosis of depression, anxiety, or some other psychiatric disorder, though the initial complaint included suicide or self-harm. Likewise, there may have been patients who presented with SI/SA/SH, but who did not disclose this in their chief complaint, and would also carry a final diagnosis not reflecting suicide or self-harm. We chose to include a broader diagnosis of psychiatric diagnoses as not all children potentially affected by the show would have SA/SI/SH, but could present with depression, anxiety or other manifestation of psychiatric illness. These consist of various mood disorders and their subsets which include but are not limited to: depression, anxiety, bipolar disorder, schizophrenia, depression, and schizophrenia.

Since experimentation with alcohol and drugs is common during this age period, we chose to include those with alcohol or drug use as a chief complaint or final diagnosis only if the patient was given a dual diagnosis of a psychiatric illness with alcohol or drug use.

D. Data Analysis

Data was entered into a Microsoft Excel 10 (Microsoft, Redmond, WA) database and analyzed using STATGRAPHICS Centurion XVI Version 16.1.11 (Statpoint Technologies, INC. The Plains, Virginia) and Analyze-It Software Version 2.24 Excel 12+ (Analyze-IT Software Ltd, Leeds, UK).

TABLE I: Demographics 2016 vs. 2017

	2016	2017
Total Patient	3381	3362
Mean Age	16.5	15.9
Female:Male	1850:1530 (55%)	1880:1482 (55.9%)

E. Calculations

Data was analyzed comparing all parameters between control (pre-release) and study (post-release) groups. Student's t-tests for all continuous variables (except for non-normal data in which case the Mann Whitney U test) was used. Chi-square was used for nominal variable. All data is expressed with 95% CI with a significant p value being less than 0.05.

III. Results

In the 120-day period surrounding the March 31, 2017 release there were 3362 pediatric psychiatric evaluations using the inclusion criteria listed. The mean age was 15.9 years (95% CI of 15.8-16.0) with an IQR of 14-18.

TABLE II: BREAKDOWN OF PEDIATRIC PSYCHIATRIC PATIENTS FOR 2017; OVERALL AND THOSE WITH SUICIDAL IDEATION ATTEMPT

	Total	60d before	60d post	Proportion	95% CI	P-value
Total Visits	3362	1563	1799	0.54	0.52-0.55	<0.0001
SI/SA/SH		218	257	0.54	0.49-0.59	0.08
Admissions (58 missing)		349	355	0.50	0.47-0.54	0.85
Admissions: total (58 missing)		349/ 1538	355/ 1766	-0.026	0.054- 0.002	0.08
Median age (years)		16.5	16			0.43

There were 1880 females (55.9%; 95% CI 54.2-57.6 p<0.0001). For the same period in 2016, there were 3381 visits with a mean age of 16.5 95% CI 16.3 to 16.5 IQR 14.2-18.9, of which 1850 were females (Table I).

Table II shows there were significantly more patient presentations in the post release 60 day period in 2017 compared to the prerelease period. 475 of 3346 patients had SI/SA/SH as a chief complaint with no difference in pre vs post release period rates though there was a trend toward more presentations for SI/SA/SH in the post release period.

Table III shows for the similar 60 day pre and post release period in 2016, there was no difference in total visits, visits for SI/SA/SH, or in admissions, though there was a trend to a greater number of total visits in the pre March 31 period for that year. Post hoc power calculations showed a 99% power to detect a true difference in pre vs post release number for 2017 data.

IV. DISCUSSION

Suicide is a considerable public health problem affecting adolescents and young adults. In the United States, suicide is the 2nd leading cause of death among youth and young adults [9], [10]. The reasons for this are often difficult to elucidate and are likely multifactorial. The role that media plays in suicidal behavior has long been subject to review and debate, with growing interest in more recent years. Media platforms including social media, new reports, as well as television and film are more accessible than ever and provide an opportunity for those who may already be at high risk for mental illness and suicidal behavior to seek out media sources that reinforce these behaviors.

"13 Reasons Why" is a Netflix 13-part television series that first aired on March 31st, 2017. It depicts the fictional story of a female high school student who committed suicide and left behind cassette tapes calling out those whom she believed drove her to her death.

This controversial series has been subject to intense scrutiny, suggesting the series could trigger what is known as a suicide contagion phenomenon or Werther effect. Suicide contagion/Werther effect describes a phenomenon in which exposure to suicide whether via family, friends or through the media, may be associated with an increase in suicidal behaviors [3]. Given the concerns for suicide contagion (Werther effect), combined with the extreme popularity of "13 Reasons Why", and the fact that all episodes were released at once, allowing for intense binge watching, we hypothesized that there would be an increase in overall psychiatric visits to emergency departments, with a corresponding increase in SI/SA/SH and admission rates related to psychiatric illness amongst the 10-20 year old population in the immediate post release period.

While we demonstrated a statistically significant 15% increase in all psychiatric visits to EDs amongst the 10-20 year old group in the 60 days post release period, we did not find a corresponding increase in presentations for SI/SA/SH or in those requiring admission. While we cannot fully attribute this increase to the show "13 Reasons Why", as patients were not queried as to whether they viewed or were familiar with the show, we found no similar change in the number of psychiatric presentations to the ED in the 60 day pre and post March 31st 2016 period. In fact, more pediatric patients presented or evaluation in the 60 days pre March 31st 2016 compared to the post 60 day period.

While our study did not show a significant increase in presentations for SI/SA/SH, a study by [17], found that there was a significant 28.9% increase in youth (ages 10 to 17) suicide in April 2017, the month after the release of "13 Reasons Why". Similarly, another study by [18], found a significant increase in child/adolescent suicide admission rates to a tertiary children's hospital after March 2017, following the release of the controversial show. Our data presents potential reasons for concern. Each year, well over 100,000 people between the ages of 10-24 years receive medical care for self-inflicted injuries at EDs across the United States, with the rates being the highest in females and in the 15-19 year old group [11].

Recent studies suggest that ED visits for self-injurious behavior are increasing. Reference [12] found that the average number of ED visits for attempted suicide and SI more than doubled between 1993 and 2008, especially in the 15-19 year old group. An analysis by [13] looked at all age groups and found that mortality rates for suicide increased by 15% from 2000-2009.

Although we don't typically think of suicide as a contagious event, numerous studies have suggested a negative relationship and the overall evidence to date suggests that suicide contagion is a real phenomenon. A study by [15] found that about half of adolescent viewers believed that "13 Reasons Why" increased their suicide risk, similar to a study conducted by [16] which showed that 55.9% of youth hospitalized in psychiatric inpatient facility report negative reactions to the show. There is substantial evidence of the significant impact of non- fictional stories on subsequent suicides, while the research on fictional suicides as in "13 Reasons Why" is equivocal [7]. However, the research has not all been focused on the negative impact of media on SI/SA.

Some have explored whether fictional portrayals of suicide could have an educative or preventive effect [4], [14]. While most of the evidence remains ambiguous, a study by [9] suggests that prevention of suicidal behavior by media reports is possible, expanding the research base to include the possibility that suicide related media can include a preventive effect on SI/SA.

TABLE III: BREAKDOWN OF PEDIATRIC PSYCHIATRIC PATIENTS FOR 2016; OVERALL AND THOSE WITH SUICIDAL IDEATION ATTEMPT

	Total	60d before	60d post	Proportion	95% CI	P-value
Total visits	3380	1745	1635	0.48	0.47- 0.50	0.06
SI/SA/SH		236	225	0.49	0.44-0.54	0.64
Admissions: total (58 missing)		430/ 1712	369/ 1609	-0.022	0.051- 0.007	0.15
Median age (years)		16.6	16.4			0.5016

Our study results suggest a slight trend towards lower psychiatric admission rates despite increased ED visits for SI/SA, posing the question of whether "13 Reasons Why" may actually offer beneficial effects by providing a catalyst for conversation. This, in turn, might prompt adolescents and young adults to seek care and treatment earlier and lead to a potential decrease in SI/SA. Even if so, in the case of "13 Reasons Why," the educational community, school counselors and parents have felt they were caught off-guard and taken by surprise when the series hit mainstream media.

Ideally, it may have been best for the producers to communicate with the schools prior to its release, in an attempt to foster open discussions within the classrooms and/or with school counselors and parents. This would hopefully allow those children who are most vulnerable and likely to be affected to by the issues addressed in the series to feel less stigmatized, more comfortable seeking help to process their feelings, and not suffer in silence, which has been shown to increase suicidality.

There are constraints to our study which can make the interpretation of our data limited. Specifically, conducting research looking at SI/SA as the outcome variable is extremely difficult due to the low volume at baseline. That some of the most vulnerable children may have committed suicide and not presented to the ED is also a possibility. These cases would be difficult to ascertain, but make research in this area more pressing. For future season releases, a prospective study asking patients whether they had viewed the show and how they feel it impacted them personally, could help further clarify the impact of shows such as "13 Reasons Why".

Furthermore, while our study demonstrates a correlation between the series and increased ED visits for psychiatric illness, it does not establish a causal effect. The ability to examine social media patterns and its impact on suicidal behavior is fraught with difficulty given the wide variability of media presentations and the magnitude of the media exposure (amount, duration, and prominence) with at-risk characteristics of the vulnerable individuals [3].

Our preliminary data does suggest a relationship between the series "13 Reasons Why" and an increase in pediatric psychiatric visits to the ED but whether this impact is positive or negative is unclear. Further research is warranted to elucidate a causal effect, the variables that contribute to this effect and whether this represents a positive or negative effect.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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