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Short communication

Crisis text patterns in youth following the release of *13 Reasons Why* Season 2 and celebrity suicides: A case study of summer 2018

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ABSTRACT

There is considerable debate in the public arena and among the professional mental health community around the media's role in increasing suicide risk following exposure to suicide-themed media in youth. A recent example involves the concerning reaction to the release of Netflix's controversial hit teen-suicide drama *13 Reasons Why*. This follow-up study examined the association between the release of *13 Reasons Why* Season 2 (*13RW2*), which coincided with two celebrity suicides, and national trends in crisis-related text conversations. We implemented an interrupted time series design to examine changes in daily counts of crisis texts aggregated at the national level following two events: (1) the release of *13RW2* and (2) celebrity suicide deaths of Anthony Bourdain and Kate Spade. We also performed a sub-analysis of suicide-related crisis conversations following each event. Crisis conversation volume was 42% higher after the release of *13RW2* for 6 of the 18 days of the study period, while crisis text usage was 51% higher for 9 out of the 18 days after the publicized celebrity suicide deaths. Both the release of *13RW2* and the celebrity suicides in the summer of 2018 were followed by an abrupt, but transient rise in crisis help-seeking among adolescents. Media outlets should consider pairing suicide-themed content with crisis support services as a core best practice to reduce the risk of population-level adverse reactions to suicide portrayals or coverage.

1. Introduction

The publicized suicide deaths of celebrities and media portrayal of deliberate self-injury are often associated with increased symptomatology among those who are currently suffering from mental health impairments (Ayers et al., 2017, Cooper et al., 2018). In 2018, several noteworthy events including the release of *13 Reasons Why* Season 2 (*13RW2*), a popular fictional show that grapples with adolescent suicide, and the deaths of two celebrities, Anthony Bourdain and Kate Spade, sparked a public debate about how these events are publicized and portrayed in the context of steadily rising suicide rates in the U.S., now the second leading cause of death among persons 10–24 years of age (CDC, 2016).

Recent research estimated that one suicide might potentially influence up to 135 individuals (Cerel et al., 2018); whereby, adolescents are the most susceptible to imitating suicidal behavior following exposure to a death by suicide (Poland et al., 2019). Text-based crisis counseling services are a rather new and under-researched platform that offers youth in crisis access to cost-free and immediate help. Limited research has shown high acceptability among youth for these texting services and a subsequent reduction in suicide rates when used (Sindahl et al., 2018, Ranney et al., 2018).

Results from emerging research examining the relationship between the release of *13 Reasons Why* Season 1 and increased suicides in youth have been mixed. For example, a recent intervention analysis comparing national suicide rates in adolescence (10–17 years), emerging adulthood (18–29 years), and early-to-mid adulthood (30–64 years) groups before and after the release of Season 1 revealed an increase in suicides for male adolescents (10–17 years) post-release (Bridge et al., 2019). Similarly, in a time series analysis of suicides among young people (<30) from Ontario, Canada in the 4 years before the release of Season 1 and afterwards (April to December 2017),

Abbreviations: CTL, Crisis Text Line; 13RW, *13 Reasons Why*; *13RW2*, *13 Reasons Why* Season 2; ARIMA, Autoregressive integrated moving average

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the model predicted 224 deaths. However, 264 suicide deaths were observed in the province of Ontario during the follow-up period, or 18% more than expected (Sinyor et al., 2019). On the other hand, a recent meta-analysis demonstrated inconsistencies in the current evidence-base for suicide in viewers exposed to fictional media due to a number of methodological (e.g., aggregate designs, ecological fallacy, publication bias) and data limitations (Ferguson, 2018). More recently, Arendt et al. conducted an in-depth analysis of 729 viewers (18–29 years) of Season 2 and showed that the fictional portrayal of suicide-themed content could have both adverse and health-promoting effects (2019).

The objective of this quasi-experimental study was to explore national help-seeking patterns in youth following the release of *13RW2* and the widely publicized celebrity deaths in the summer of 2018 to examine how these events are temporarily related to trends in Crisis Text Line (CTL) usage. Our current study is a follow-up to previous work, which identified a significant decline in CTL usage following the release of *13RW* Season 1 (Thompson et al., 2019). CTL is a non-profit organization that provides a nationally available and confidential text message service for individuals in crisis and is featured in *13RW* Season 2 as a resource for viewers. We hypothesized that the release of *13RW2* and the two celebrity deaths would result in an immediate and temporary spike in crisis conversations, a proxy for help-seeking behavior. Text message-based crisis support services offer an unprecedented opportunity to connect at-risk adolescents with effective, accessible crisis services at no cost.

2. Data

Anonymized CTL text messaging data was obtained from January 20 to October 31, 2018, for the entire US (n = 584,157) (Fig. 1). Crisis conversations spanned a range of topics, including “Depression,” “Sadness,” “Anxiety” to “Suicidal Thoughts” (Crisis Trends, 2018). Due to privacy concerns, for the purpose of this analysis, crisis texts were aggregated to include daily counts of CTL conversations for any reason, and a smaller subset of crisis texts were analyzed that were tagged by crisis counselors as “suicidal thoughts.” At the end of each crisis conversation, CTL administers an optional survey that collects demographic information on the caller. Survey responses (n = 187,776) showed that 8 out of 10 texters were under the age of 24; whereby individuals ages 14–17 years were the largest user group of CTL (40%), followed by the 18–24 (25%) and the ≤13 age groups (15%), respectively.

3. Methods

Following the same methodology in our previously published brief (Thompson et al., 2019), we performed an interrupted time-series analysis using autoregressive integrated moving average (ARIMA) modeling of a time series of daily crisis text counts to determine the expected number of crisis texts during the days following each event. Two separate forecasts were predicted following the release of *13RW2* for May 18 (release date) to June 4 (the post-intervention period for *forecasts 1*) and June 5 to June 22 (the post-intervention period for *forecasts 2*) following the suicidal deaths of Kate Spade and Anthony

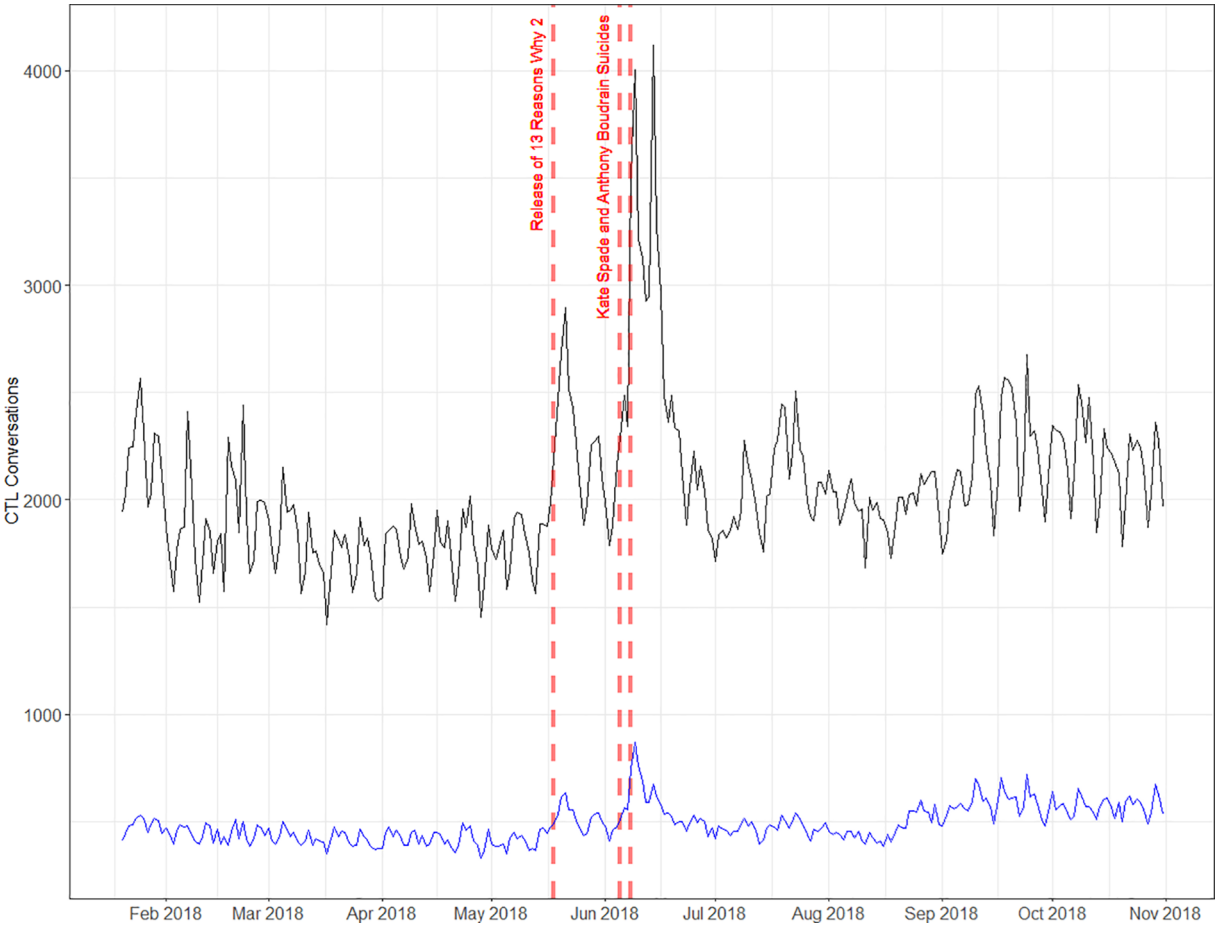

Fig. 1. Daily time series of national-level Crisis Text Line (CTL) conversations (black line) and suicidal thought related CTL (blue line) conversations from January 1 to October 31, 2018. ARIMA models were calculated using the period January 20 to May 17 for the release of 13 Reasons Why Season 2 (May 18) and from January 20 to June 4 for the suicidal deaths of Kate Spade (June 5) and Anthony Bourdain (June 8), national celebrities whose deaths received significant media attention.

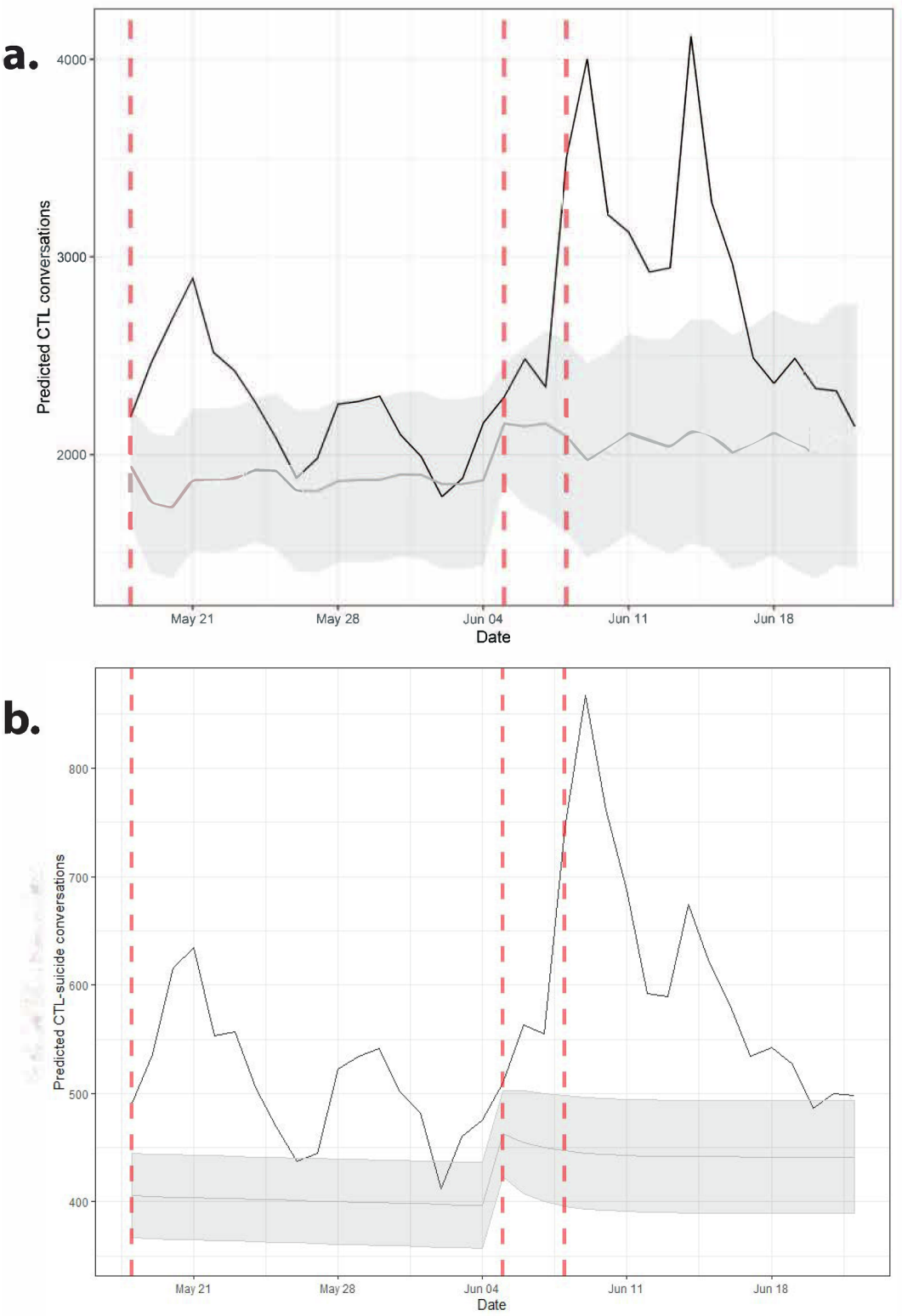

Fig. 2. (A) Expected national-level CTL crisis conversations (grey line) and 95% confidence level (grey shading) compared to observed crisis conversation (black line) for the forecasted May 18 to June 22 period. Excess national-level crisis conversations were maximized on June 9 after the death of Anthony Bourdain. (B) Expected national-level CTL suicidal thought conversations (grey line) and 95% confidence level (grey shading) compared to observed crisis conversation for suicidal thoughts (black line) for the forecasted May 18 to June 22 period. Red dashed lines depict the release of *13 Reasons Why* Season 2 (May 18), Kate Spade's suicide (June 5) and Anthony Bourdain's suicide (June 8).

Bourdain (Fig. 2). The 18-day cut-off was chosen based on the number of days between *13RW2's* release and the celebrity deaths and is a similar length as Ayers et al. (2017)'s forecast of *13RW* Season 1. Seasonality was not adjusted for in the model given the short duration of the time series. The ARIMA model (7, 0, 1) and (5, 1, 3) was used to examine the difference in observed and forecast for the expected crisis texts with 95% confidence intervals (CIs) using the astra package in R (R Core Team, 2018, Stoffer, 2017). This analysis was repeated for

national-level crisis conversations related to "suicidal thoughts" (n = 60,028). An ARIMA model (0,1,1) and (1,0,0) was used to examine the differences in observed and expected conversations. Significance was tested for different periods using a paired-*t*-test of bootstrapped samples of the difference for expected versus observed CTL conversations ($\alpha = 0.05$). Study approval was obtained from the Institutional Review Board (IRB) at Appalachian State University (IRB #19-0174).

4. Results

An excess of approximately four times the expected volume of crisis conversations (n = 20,500 95% CI: 3700–37,300) occurred from May 18 to June 22, the entire post-intervention period. Following the release of *13RW2*, observed CTL volume for 6 of the 18 days studied were significantly higher than expected with an excess of 4302 crisis conversations (95% CI: 2090–6514). The publicized suicide deaths of celebrities resulted in significantly more than expected CTL use for 9 out of the 18 days with an excess of 11,544 crisis conversations (95% CI: 6771–16318). Expected versus observed differences for CTL conversations following the suicide deaths of Anthony Bourdain and Kate Spade (6/5–6/22) were nearly 2.7 times higher than CTL conversations following the release of *13RW2* (5/18–6/4).

The subanalysis of suicidal thought-related crisis texts found similar trends with an excess of 4782 crisis conversations (95% CI: 3163–6402) or an increase of 31% suicide-related texts for the entire post-intervention period (May 18–June 22). Expected versus observed differences for CTL conversations related to suicidal thoughts demonstrated a 51% increase in excess conversations following the suicide deaths of Anthony Bourdain and Kate Spade (n = 2829, 95% CI: 1915–3742) compared to the release of *13RW2* (n = 1868, 95% CI: 1201–2535).

5. Discussion

The release of *13RW2* and celebrity suicides are temporally correlated with significant spikes in crisis conversations. Our quasi-experimental designed study is the first to use high resolution, national text-based data that reveals a significant relationship between highly publicized celebrity deaths by suicide, and media portrayals of suicide and help-seeking patterns among young people. Our results build upon the research team's prior research examining CTL conversations following the release of *13RW* Season 1, which noted a significant decline in CTL conversation following Season 1 release (Thompson et al., 2019).

The "Werther effect" or "celebrity suicide effect" theorizes that suicides are more common among vulnerable individuals following a high-profile celebrity suicide, and has been documented yet controversial (Phillips, 1974; Niederkrotenthaler et al., 2010). A recent analysis of national suicide rates revealed a 10% increase in suicides (~2000 additional deaths) in the four months following the celebrity suicide of Robin Williams (Fink et al., 2018), and results may be similar for other celebrities. In our study, the rates of national-level crisis conversations were significantly higher following celebrity suicides than the release of *13RW2*, particularly for Anthony Bourdain, a celebrity with a popular television show and a potentially wider viewership audience among youth. Our results suggest that help-seeking behaviors reveal similar trends as suicide rates following celebrity deaths and that these help-seeking behaviors are higher following celebrity death and after the release of the television series *13RW2*.

These data regarding increased help-seeking around high-profile suicide deaths might counterbalance the concern that media portrayals of suicide are uniformly associated with adverse events (e.g., contagion; Mueller, 2019). Indeed, CTL and Netflix partnered to jointly promote help-seeking among its viewers before the release of *13RW2*. The promotion of help-seeking behavior in *13RW2* contrasts sharply with our results examining *13RW* Season 1 where the development of services like CTL was not widely-distributed, and a notable reduction in CTL conversations post-*13RW* Season 1 release were observed (Thompson et al., 2019). In light of these findings, other traditional and social media outlets should follow suit and consider adding CTL text shortcodes and suicide hotlines as a prominent feature on their websites and news stories to encourage, normalize, and promote help-seeking behaviors.

A significant limitation of our study is the aggregate ecological design, which does not include information on suicide attempts, deaths by suicide, or other adverse mental health outcomes. However, in addition to demonstrating a significant spike in crisis support-seeking behaviors, we also identified a population-level peak in crisis texts for suicidal thoughts. The interrupted time series analysis is a useful tool for evaluating the longitudinal effects of large-scale "natural experiments" (e.g., release of a Netflix series or celebrity suicide) that occur at a specific time point; whereby results take into account pre-intervention trends to better characterize the impact (i.e., level and slope change pattern) and are generally unaffected by typical confounding factors that remain constant over time (e.g., secular trends in socioeconomic differences occur slowly over time) (Bernal et al., 2017; Kontopantelis et al., 2015). Further, the quasi-experimental design is a robust method widely used in other help-seeking and mental health resaerch (e.g., Thompson et al., 2019; Ayers et al., 2017; Cooper et al., 2018). Additionally, our findings are limited to increased support-seeking behaviors for crisis events related to suicidal thoughts. That is, there was no way to ascertain whether the spikes in help-seeking were directly associated with suicidal behaviors (e.g., attempts) among those who sought assistance. More research is needed to understand how the public health community can better leverage data from these innovative text-based crisis platforms to improve situational monitoring and rapid response efforts following media portrayals and reports of suicide-themed content to identify and intervene for those at risk for suicide.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2019.100999.

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Update

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Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Declaration of Competing Interest statements were not included in the published version of the following articles that appeared in previous issues of Preventive Medicine Reports.

The appropriate Declaration/Competing Interest statements, provided by the Authors, are included below.

1. "Congestive heart failure-related hospital deaths across the urban-rural continuum in the United States" [Preventive Medicine Reports, 2019; 16: 101007] https://doi.org/10.1016/j.pmedr.2019.101007

Declaration of competing interest: The authors have no conflicts of interest to disclose

2. "Coronary artery calcium testing: A call for universal coverage" [Preventive Medicine Reports, 2019; 15: 100879] https://doi.org/10.1016/j.pmedr.2019.100879

Declaration of competing interest: The authors have no conflicts of interest to disclose

3. "Way2Go! Social marketing for girls' active transportation to school" [Preventive Medicine Reports, 2019; 14: 100828] https://doi.org/10.1016/j.pmedr.2019.100828

Declaration of competing interest: The authors have no conflicts of interest to disclose

4. "Linking studies to assess the life expectancy associated with eighth grade school achievement" [Preventive Medicine Reports, 2019; 16: 100980] https://doi.org/10.1016/j.pmedr.2019.100980

Declaration of competing interest: The authors have no conflicts of interest to disclose

5. "Disentangling individual and neighbourhood differences in the intention to quit smoking in Asian American male smokers" [Preventive Medicine Reports, 2020; 18: 101064] https://doi.org/10.1016/j.pmedr.2020.101064

Declaration of competing interest: Conflict of Interest: None

6. "Do population trends in adolescent electronic cigarette use coincide with changes in prevalence of cigarette smoking?" [Preventive Medicine Reports, 2019; 15: 100913] https://doi.org/10.1016/j.pmedr.2019.100913

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7. "A text mining approach for adapting a school-based sexual health promotion program in Colombia" [Preventive Medicine Reports, 2020; 18: 101090] https://doi.org/10.1016/j.pmedr.2020.101090

Declaration of competing interest:

- All authors have participated in (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version.
- This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue.
- The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript
- The following authors have affiliations with organizations with direct or indirect financial interest in the subject matter discussed in the manuscript:"

8. "Provider reported implementation of nutrition-related practices in childcare centers and family childcare homes in rural and urban Nebraska" [Preventive Medicine Reports, 2019; 17: 101021] https://doi.org/10.1016/j.pmedr.2019.101021

Declaration of competing interest: All the authors do not have any conflicts of interest with this study. The authors have no conflicts of interest to disclose.

9. "Neighbourhood built and social environment and meeting physical activity recommendations among mid to older adults with joint pain" [Preventive Medicine Reports, 2020; 18: 101063] https://doi.org/10.1016/j.pmedr.2020.101063

Declaration of competing interest: All the authors do not have any conflicts of interest with this study. The authors have no conflicts of interest to disclose.

10. "BWHealthy Weight Pilot Study: A randomized controlled trial to improve weight-loss maintenance using deposit contracts in the workplace" [Preventive Medicine Reports, 2020; 17: 101061] https://doi.org/10.1016/j.pmedr.2020.101061

Declaration of competing interest:

DOIs of original article: https://doi.org/10.1016/j.pmedr.2020.101090, https://doi.org/10.1016/j.pmedr.2020.101061, https://doi.org/10.1016/j.pmedr.2020.101155, https://doi.org/10.1016/j.pmedr.2019.100999, https://doi.org/10.1016/j.pmedr.2019.100995, https://doi.org/10.1016/j.pmedr.2019.100828, https://doi.org/10.1016/j.pmedr.2020.101063, https://doi.org/10.1016/j.pmedr.2019.101016, https://doi.org/10.1016/j.pmedr.2019.101007, https://doi.org/10.1016/j.pmedr.2020.101181, https://doi.org/10.1016/j.pmedr.2020.101064, https://doi.org/10.1016/j.pmedr.2019.100913, https://doi.org/10.1016/j.pmedr.2019.100879, https://doi.org/10.1016/j.pmedr.2019.100980, https://doi.org/10.1016/j.pmedr.2019.101021.

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- All the authors do not have any conflicts of interest with this study
- The authors have no conflicts of interest to disclose or
- A conflicting interest exists when professional judgement concerning a primary interest (such as patient s welfare or the validit of research) may be influenced by a secondary interest (such s financial gain o personal rivalry). It may arise for the authors hen the have financial interest that ay influence their interpretation of their results o t ose of others. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding.
- I have no conflicts of interest to declare.

11. "Varicella-zoster virus post-exposure management and prophylaxis: A review" [Preventive Medicine Reports, 2019; 16: 101016] https://doi.org/10.1016/j.pmedr.2019.101016

Declaration of competing interest: The corresponding author declares the following financial or other relationships with companies or organizations that are stakeholders on the topic of the manuscript. For details read this fact sheet. Insert the same information in the manuscript as a final disclosure section. The following authors report specific relationships that could be interpreted as implying a conflict (name author, nature of the relationship, and company or organization)

12. "Self-organizing peer coach groups to increase daily physical activity in community dwelling older adults" [Preventive Medicine Reports, 2020; 20: 101181] https://doi.org/10.1016/j.pmedr.2020.101181

Declaration of competing interest: The authors have no conflicts of interest to disclose

13. "How socioeconomic status influences self-care for Black/African American women: A differential item analysis" [Preventive Medicine Reports, 2020; 20: 101155] https://doi.org/10.1016/j.pmedr.2020.101155

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14. "Novel policing techniques decrease gun-violence and the cost to the healthcare system" [Preventive Medicine Reports, 2019; 16: 100995] https://doi.org/10.1016/j.pmedr.2019.100995

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15. "Crisis text patterns in youth following the release of 13 Reasons Why Season 2 and celebrity suicides: A case study of summer 2018" [Preventive Medicine Reports, 2019; 16: 100999] https://doi.org/10.1016/j.pmedr.2019.100999

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