Abstract

Internationally, there are indications of an increasing trend in suicide contagion and clustering, which has been associated with contemporary communication technology and continuous communication across jurisdictions. Research has indicated varying effects related to different types of media and media contents in terms of impacts on suicidal behaviour. A comprehensive literature search was conducted into research addressing different types of media and media contents and the impact on suicide contagion and clustering, covering January 2003 - February 2021. Across the 41 selected studies, we identified consistency in terms of both increased quantity of media reports and portrayal of specific details of suicide cases, including celebrities and fictional cases, to be significantly associated with suicide contagion and increased suicide rates or mass clusters, with significant impacts on increased risk of suicide contagion within the first days up to the first three months following the media coverage. The impact of potentially harmful content and the portrayal of suicide and self-harm via internet sites and social media on suicide contagion and clustering was largely consistent with research into impacts involving traditional media. The findings underline the need to prioritise implementation and adherence to media guidelines for reporting suicide for media professionals, online and social media outlets.

Sammendrag

Internasjonalt har man funnet holdepunkter for en økende trend i forekomsten av smitte-effekter og lokale opphopninger av selvmord. Man har antatt at dette kan henge sammen med moderne kommunikasjonsteknologi og kommunikasjon som i vår tid skjer uhindret på tvers av landegrenser og lovgivning. Forskning viser varierende effekter knyttet til ulike typer media og medieinnhold i forhold til deres virkning på forekomsten av selvmordsatferd. Et omfattende litteratursøk ble utført med fokus på ulike typer media og medieinnhold i forhold til smitte-effekter og forekomsten av lokale opphopninger av selvmord, der studier publisert i tidsperioden januar 2003 til februar 2021 ble inkludert. På tvers av de 41 inkluderte studiene, kunne vi fastslå at både når det gjelder antall mediesaker og hvordan selvmord ble fremstilt i de ulike sakene, inklusiv hvordan selvmord blant kjente personer og fiktive selvmord ble fremstilt, var det en signifikant sammenheng med selvmordssmitte og økt selvmordsrate eller lokale opphopninger av selvmord. Smitte-effekten var signifikant fra de første dagene opp til tre måneder etter den konkrete mediedekningen. Disse smitte-effektene knyttet til potensielt skadelig medieinnhold og til hvordan selvmord og villet egenskade blir fremstilt på internett og sosiale media er i store trekk konsistente med hva forskning tidligere har vist om virkningene av tradisjonelle media. Funnene understreker betydningen av å legge vekt på å implementere retningslinjer for massemediene i hvordan de bedre kan fremstille selvmord på nett og i sosiale medier.

Suicide clustering and contagion:

The role of the media

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Introduction

Internationally, there is growing public and professional interest in suicide clusters and contagion. There are indications of increasing clustering and contagion effects in suicidal behaviour, particularly among young people (Robertson et al., 2012; Hawton et al., 2020), owing to factors such as contemporary communication technology and continuous instant communication, devoid of geographic limitations (Larkin & Beautrais, 2012; Robertson et al., 2012; Hawton et al., 2020).

Suicide clusters are relatively uncommon, yet they are a cause for community concern due to the potential impact of contagion linked with such phenomena (Robinson et al., 2016). Whilst there are different types of suicide clusters, it is important to clarify these differences when considering the (potential) impact of the media. There is consistent evidence supporting the notion that mass suicide clusters are clusters of suicides localised in time but not space and have been attributed to the dissemination of information concerning celebrity suicides via traditional mass media (Mesoudi, 2009), online or social media (Robinson et

al., 2015). Point clusters are commonly referred to as clusters of suicides localised in both time and space and have been attributed to direct social learning from nearby individuals with limited or no impact via the media (Mesoudi, 2009). Contagion is a concept derived from the study of infectious diseases and increasingly applied to cluster suicides. The underlying assumption is that suicidal behaviour may facilitate the occurrence of subsequent suicidal behaviour, either directly (via contact or friendship with the index suicide) or indirectly (via the media) (Haw et al., 2013).

Suicide clustering is estimated to be two to four times more common amongst the youth population (Hawton et al., 2020). Furthermore, children and adolescents are the most susceptible age group for imitating suicidal behaviour, which could be further compounded by difficulties in self-regulation when confronted by potentially harmful media content (Van Deursen et al., 2015). However, research has indicated varying effects associated with different types of media and media contents in terms of impacts on suicide contagion and clustering (Gould et al., 2003). Vulnerable young people have shown to be more

Researchers have increasingly indicated that further exploration is needed to understand the association between the manner in which news is reported, the nature of the potentially harmful media content and the size of imitative effects in relation to suicide contagion and clustering.

susceptible to portrayal of suicide in the news media, compared to fictional reports (Gould et al., 2003). Research has also identified significant effects of televised or online suicide portrayals that have led to increased rates of suicidal behaviour, using the same methods displayed in the shows (Gould et al., 2003). In addition, in a Japanese study on the impact of media reporting of celebrity suicides on suicide contagion, Ueda and colleagues (2014) identified significant increases in the total number of suicides immediately following the media coverage of celebrity suicides within 10 days after the publication of news reports, whilst controlling for seasonal effects and time-specific peaks.

Researchers have increasingly indicated that further exploration is needed to understand the association between the manner in which news is reported, the nature of the potentially harmful media content and the size of imitative effects in relation to suicide contagion and clustering (Gould et al., 2003; Haw et al., 2012; Hawton et al., 2020). Within this context, the present review aims to 1) identify studies that addressed impacts of media on suicide contagion and clustering, and 2) compare different types of media and media contents in terms of the impact on suicide contagion and clustering (page 4).

Method

A narrative review of the academic literature was conducted using MEDLINE, PsycINFO, CINAHL and EBSCO databases. Journal articles (including original research, review articles, short reports, and letters) were the basis of the search, covering the period January 2003 – February 2021. The search terms included “suicid”, “self-injur”, “self-poison”, “suicidal behaviour”, “suicidal ideation”, “suicide planning”, “pro suicide”, “suicide pact”, “cluster”, “imitat”, “copy-cat”, “contag”, “social media”, “online social network”, “hashtag”, “internet”, “world wide web”, “online

platform”, “online forum”, “online video”, “online image”, “blog”, “chatroom” and “online search engine”. We selected as a starting point the article by Gould and colleagues (2003), which provided a comprehensive overview of different types of media and its impact on suicide contagion and clustering. Primary and secondary articles addressing suicide clusters and/or contagion and different types of media impacts (media, tv, internet, social media, online social network, online video, online image, online forums or message boards, pro-suicide, and self-harm websites, online platform, online series) were selected. A total 41 articles were included. Subgroup analysis was conducted on each identified type of media.

Results

Types of media and media contents

Table 1 outlines the 41 selected studies which address different types of media and media contents. The identified subgroups include media reporting of characteristics of suicide cases and suicide contagion and clustering, media reporting of celebrity suicides, social media use, potentially harmful content via social media and search engines, facilitation of suicide contagion via social media, fictional portrayals of suicide online and on television, online suicide pacts, pro-suicide and self-harm sites and suicide notes online (Table 1. Article subgroups).

Media reporting of characteristics of suicide cases and suicide contagion and clustering

Cheng and colleagues (2011) examined the impact of media reporting on suicide contagion and clustering in relation to suicides by staff members of a giant electrical manufacturing company, Foxconn. Relevant articles were collected from representative newspapers published in three major cities in mainland China. A temporal suicide clustering effect was

Authors	Title	Study design
Media reporting of characteristics of suicide cases and suicide contagion and clustering		
Stack (2005)	Suicide in the media: A quantitative review of studies based on nonfictional stories	Quantitative review
Cheng et al. (2007)	The influence of media coverage of a celebrity suicide on subsequent suicide attempts	Time-series study
Fu & Yip (2009)	Estimating the risk for suicide following the suicide deaths of 3 Asian entertainment celebrities: a meta-analytic approach	Time-series study and meta-analysis
Niederkrotenthaler et al. (2010)	Role of media reports in completed and prevented suicide: Werther v. Papageno effects	Ecological study
* Niederkrotenthaler et al. (2012)	Changes in suicide rates following media reports on celebrity suicides: A meta-analysis	Meta-analysis
Sisack & Värnik (2012)	Media Roles in Suicide Prevention: A Systematic Review	Systematic review
Gould et al. (2014)	Newspaper coverage of suicide and initiation of suicide clusters in teenagers in the USA, 1988–96: a retrospective, population-based, case-control study	Case-control study
John et al. (2016)	Newspaper Reporting on a Cluster of Suicides in the UK	Narrative review
Media reporting of celebrity suicides		
Pirkis et al. (2006)	The relationship between media reporting of suicide and actual suicide in Australia	Time-series study
Liu et al. (2007)	Charcoal burning suicides in Hong Kong and urban Taiwan: an illustration of the impact of a novel suicide method on overall regional rates	Trend analysis
Niederkrotenthaler et al. (2009)	Copycat effects after media reports on suicide: a population-based ecologic study	Population-based ecological study
* Niederkrotenthaler et al. (2012)	Changes in suicide rates following media reports on celebrity suicides: A meta-analysis	Meta-analysis
Ladwig et al. (2012)	The railway suicide death of a famous German football player: impact on the subsequent frequency of railway suicide acts in Germany	Time-series study
Hegerl et al. (2013)	One followed by many? Long-term effects of a celebrity suicide on the number of suicidal acts on the German railway net	Time-series study
Ueda, Mori & Matsubayashi (2014)	The effects of media reports of suicides by well-known figures between 1989 and 2010 in Japan	Time-series study
Jang et al. (2016)	Copycat Suicide Induced by Entertainment Celebrity Suicides in South Korea	Time-series study

Authors	Title	Study design
Ueda et al. (2017)	Tweeting celebrity suicides: Users' reaction to prominent suicide deaths on Twitter and subsequent increases in actual suicides	Time-series study
Pirkis et al. (2020)	Suicides in Australia following media reports of the death of Robin Williams	Time-series study
Social media use		
Fu et al. (2013)	Responses to a self-presented suicide attempt in social media: a social network analysis	Case-series study
Howard & Surtees (2016)	A case series review of suicides associated with social media use in South Tyneside, England	Case-series study
Padmanathan et al. (2020)	Social media use, economic recession and income inequality in relation to trends in youth suicide in high-income countries: a time trends analysis	Time-series study
Potentially harmful content via social media and search engines		
Bell et al. (2018)	Suicide-related internet use among suicidal young people in the UK: Characteristics of users, effects of use, and barriers to offline help-seeking	Cross-sectional study
Sinyor et al. (2021)	The association between Twitter content and suicide	Time-series study
Facilitation of suicide contagion via social media		
Birbal, Maharajh & Birbal (2009)	Cybersuicide and the adolescent population: Challenges of the future?	Narrative review
Robertson et al. (2012)	An adolescent suicide cluster and the possible role of electronic communication technology	Case study
Li, Huang & Zhu (2018)	A systematic analysis of online broadcasts of suicidality in China	Systematic review
Poonai et al. (2017)	The association of exposure to suicide-related Internet content and emergency department visits in children: A population-based time-series analysis	Time-series study
Swedo et al. (2021)	Associations between social media and suicidal behaviors during a youth suicide cluster in Ohio	Cross-sectional study
Fictional portrayals of suicide online and on television		
Niederkrötenhaler et al. (2019)	Association of increased youth suicides in the United States with the release of 13 Reasons Why	Time-series study

Authors	Title	Study design
Sinyor et al. (2019)	Suicides in Young People in Ontario Following the Release of "13 Reasons Why"	Time-series study
Bridge et al. (2020)	Association between the release of Netflix's 13 Reasons Why and suicide rates in the United States: An interrupted time-series analysis	Time-series study
Online suicide pacts		
Jiang et al. (2016)	Analysis of internet suicide pacts reported by the media in mainland China	Time-series study
Sinyor et al. (2018)	The association between suicide deaths and putatively harmful and protective factors in media reports	Observational study
Lee & Kwon (2018)	Twitter as a place where people meet to make suicide pacts	Trend analysis
Pro-suicide and self-harm sites		
Shah (2009)	The relationship between general population suicide rates and the Internet: a cross-national study	Cross-national study
Mitchell et al. (2014)	Exposure to websites that encourage self-harm and suicide: Prevalence rates and association with actual thoughts of self-harm and thoughts of suicide in the United States	Cross-sectional study
Till et al. (2017)	Beneficial and harmful effects of educative suicide prevention websites: randomised controlled trial exploring Papageno v. Werther effects	Randomised-controlled trial
Suicide notes online		
Ruder et al. (2011)	Suicide announcement on Facebook	Case study
Belfort, Mezzacappa & Ginnis (2012)	Similarities and differences among adolescents who communicate suicidality to others via electronic versus other means: a pilot study	Case-series study
Fu et al. (2013)	Responses to a self-presented suicide attempt in social media	Exploratory study employing quantitative content analysis
Cheng et al. (2015)	Suicide Communication on social media and Its Psychological Mechanisms: An Examination of Chinese Microblog Users	Cross-sectional study

* Article included in more than one subgroup .

Evidence exists to support the notion that suicide contagion and clustering is more prominent when media coverage is extensive and when suicides are glamorised and reported on in detail, with a greater impact on suicides that are similar to the respective model in terms of age group, gender and suicide method.

→ identified, whereby reporting and the occurrence of a Foxconn suicide/attempt were found to be associated with an elevated chance of a further Foxconn suicide three days later. The occurrence of a Foxconn suicide also immediately influenced the intensity of both internet-based searching and newspaper reporting. Gould and colleagues (2014) conducted a retrospective, population-based, case-control study, and they identified suicide clusters in young people aged 13-20 years in the United States (US) from 1988 to 1996 (preceding social media) using the time-space scan statistic. Newspapers within each cluster community were examined for stories about suicide published in the days between the first and second suicide in the cluster. The mean number of news stories about suicidal individuals published after an index cluster suicide (7.42) was significantly greater than the mean number of suicide stories published after a non-cluster suicide (5.14). Several story characteristics, including front-page placement, headlines containing the word suicide, or a description of the method used, and detailed descriptions of the suicidal individual and act, appeared more often in stories published after the index cluster suicides than after non-cluster suicides.

Following a suicide cluster among young people in Bridgend, United Kingdom (UK), John and colleagues (2017) examined the quantity and quality of newspaper reporting for six months before and after the defined cluster (June 26, 2007, to September 16, 2008). Among the total of 577 identified newspaper articles, one in seven articles included the suicide method in the headline, 47.3% referred to earlier suicides, and 44% used phrases that guidelines suggest should be avoided, while only 13% included sources of information or support. The authors conclude that a high level of poor-quality and sensationalist reporting occurred during an ongoing suicide cluster. A strong body of evidence suggests that lack of adherence to the media guidelines for reporting suicide can have

copycat and imitative effects, particularly for vulnerable people, such as individuals with depression and those who have engaged in self-harm (Cheng et al., 2007; Fu & Yip, 2009; Niederkrotenthaler et al., 2012; Niederkrotenthaler et al., 2010; Sisask & Värnik, 2012; Stack, 2005). The literature indicates that one instance of intense or substantial media coverage of a novel method can increase the incidence of suicide by that method (Chang et al., 2010), with this increase remaining after the media coverage decreases (Lee et al., 2014).

Media reporting of celebrity suicides

Evidence exists to support the notion that suicide contagion and clustering is more prominent when media coverage is extensive and when suicides are glamorised and reported on in detail (Niederkrotenthaler et al., 2012; Pirkis et al., 2006), with a greater impact on suicides that are similar to the respective model in terms of age group, gender and suicide method (Niederkrotenthaler et al., 2009). In this regard, Ladwig et al. (2012) found an 81% increase in railway suicides during a six-week period following the death of a well-known German football goalkeeper who jumped in front of a train. Hegerl et al. (2012) studied the long-term effects and identified an 18.8% increase in railway suicides during the two years after this event, compared to the two years before. Regarding the impact of the media, the authors conclude that media reports followed the media guidelines to some extent, although, it remains uncertain as to what the extent of the increase in railway suicides may have been if the media had followed the guidelines more thoroughly (Ladwig et al., 2012). Following the death by suicide of Robin Williams on August 11, 2014, Pirkis et al. (2020) identified an 11% increase in suicides in Australia in the five-month period following Williams' death, which was highly publicised in the Australian media, the majority involving men aged 30-64 and by

people who died by hanging, the same method used by Robin Williams.

In Japan, Ueda et al. (2014) found that media reports on celebrity suicides were associated with an immediate increase in total suicides, which increased by 4.6% on the day that media reports of celebrity suicides were published. The increase lasted for approximately 10 days after the publication of news reports. This study also identified variation across different types of celebrities in terms of impact on suicide contagion, with the highest impact following reports of nationally-recognised politicians (14.8%), while deaths of entertainment celebrities were followed by a 4.7% increase in the total number of suicides.

In South Korea, Jang et al. (2016) identified a significant association between the portrayal of celebrity suicide and the number of suicides immediately post-event, especially in people of the same gender and age group, with many even applying the same reported method.

An examination of Twitter posts and deaths by suicide in Japan identified an increase in suicides only when suicide deaths provoked a significant response from users (Ueda et al., 2017). In addition, deaths of younger celebrities generated a higher number of posts on Twitter. The authors suggest that it is necessary to examine social, as well as traditional news media when examining the impact of media reports on suicides (Ueda et al., 2017).

Media reports covering details of less well-known people, but elaborating on specific details of suicide

methods, such as carbon monoxide poisoning by burning barbecue charcoal and inhaling hydrogen sulphide gas were also associated with significant increases in subsequent suicides (Liu et al., 2007).

Social media use

A recent study of suicide rates among 15-24 year-olds in eleven high-income countries, with populations of more than 20 million from 2000-2017, discovered some evidence of an association between daily social media use and youth suicide trends (Padmanathan et al., 2020). A case series review of suicides associated with social media use in South Tyneside, England, where evidence from social media was cited at inquest, concluded that the deceased were more likely to have been over 45 years-old, to have been single and in employment, but less likely to have been diagnosed with mental illness than those in which social media evidence was not cited. The authors note that public health campaigns around safe use of social media may need to be directed at middle aged people, in addition to the identified target audience of younger generations (Howard & Surtees, 2016). The above studies used trend analyses and case series to examine the relationship between social media use and suicide trends and profiles of the deceased, but did not examine a direct association between the social media exposure and suicide contagion and clustering. It should be noted that social media may also have a positive role in supporting people at risk for suicide (Fu et al., 2013).

Potentially harmful information via social media and search engines

Sinyor et al. (2021) examined suicide-related tweets geolocated to Toronto, Canada, and originating from the highest-level influencers over a one-year period (July 2015 to June 2016), coding for general, putatively-harmful and putatively-protective content, and assessing whether tweet characteristics were associated with increases or decreases in suicide deaths. They identified an independent association between tweets about the suicide of a local newspaper reporter, social causes of suicide, including cultural, relational and legal problems, advocacy efforts and suicide death, and subsequent increases in suicide within the seven days post-reporting.

A study of suicide-related internet use among suicidal young people in the UK identified two predominant drivers of suicide-related internet use among suicidal young people: to connect with others and to seek information. The authors note that both concepts had positive and negative effects and suggest that websites containing information about suicide methods and their lethality can be perceived as helpful or harmful, contingent moderately on “masculine” or “feminine” modes of expression (Bell et al., 2018).

Facilitation of suicide contagion via social media

A recent study of associations between social media and suicidal behaviours during a suicide cluster involving young people in the US found that engagement with suicide cluster-related social media was associated with increased suicide ideation and suicide attempts during a suicide cluster in Ohio (Swedo et al., 2020).

Memorial pages may also facilitate contagion and copycat behaviour. An examination of the relationship between an adolescent suicide cluster and the role of electronic communications in New Zealand found that several cases were not linked to a single school. Instead several were connected by social media websites, including websites created in memory of previous adolescents who had taken their own lives. The authors remark that social media websites assisted the rapid spread of information about the deaths in the community and made the identification and management of a possible cluster more difficult (Robertson et al., 2012). However, in contrast, a study of presentati-

ons to emergency departments in Ontario, Canada, found that an increase in suicides from October 2012 to December 2013 among 11-17 year olds could not be attributed to a highly publicised adolescent suicide. The authors conclude that suicide-related internet content was not associated with the increase in ED visits for suicidal behaviour (Poonai et al., 2017).

The possibility of livestream suicides (via social media) initiating a suicide contagion has been identified as a concern in the literature (Birbal et al., 2009). While there is a lack of research in this area, a systematic analysis of online broadcasts of suicide in China found that the most commonly applied suicide method was cutting (57.5%), the location of death was most frequently at home (35.2%), and instant messaging apps (52.8%) were commonly used for broadcasting suicidal thoughts (Li et al., 2018).

Fictional portrayals of suicide online and on television

We identified three studies that examined the impact of online series portraying the suicide of an adolescent girl on suicide contagion and clustering. Bridge et al. (2019) examined the impact of the release of *13 Reasons Why*, on March 31, 2017, on suicide rates in US. The Netflix series *13 Reasons Why* portrays the suicide death involving wrist cutting by the protagonist. The authors found that the overall suicide rate among 10-17 year-olds increased significantly in the month immediately following the release of *13 Reasons Why*, while accounting for seasonal effects and an underlying increasing trend in monthly suicide rates. No significant change in level or trend of suicide after the show's release was identified for 18-29 year-olds and 30-64 year-olds. Another study conducted in the US by Niederkrotenthaler and colleagues (2019), based suicide mortality data from the Centers for Disease Control and Prevention's WONDER (Wide-ranging Online Data for Epidemiologic Research) database, used Twitter and Instagram posts as a proxy to estimate the amount of attention the show received via social media from April 1, 2017, to June 30, 2017. Public interest in the show was highest in April 2017 and decreased following June 2017. For 10-19 year-old adolescents, statistical models assessing three month associated suicide mortality indicated 66 excess suicides among males (12.4%) and 37 (21.7%) among females. No excess suicide mortality was observed in

Overall, we identified consistency in terms of both increased quantity of media reports and portrayal of specific details of suicide cases, including celebrities and fictional cases, to be significantly associated with suicide contagion and increased suicide rates or mass clusters, with significant impacts on increased risk of suicide contagion within the first days up to the first three months following the media coverage.

other age groups, and the increase in the suicide method of hanging was particularly high (26.9%). Sinyor et al. (2019) examined changes in the number of suicides in young people aged below 30 years-old in the province of Ontario, following the release of *13 Reasons Why*. Time-series analyses were performed using data from January 2013 to March 2017 to predict expected deaths from April to December 2017, with modelling results predicting 224 suicides. However, 264 suicides were observed, representing an 18% increase. Other fictional portrayals of suicide have been broadcasted on television and online, for example, *It's My Party* and *Night, Mother*. The influence of these two films on viewers has been explored by Till and colleagues (2013; 2015). However, no other film, television or online series has received as much attention as *13 Reasons Why* in published literature.

Online suicide pacts

Sinyor and colleagues (2018) examined the association between specific article characteristics and fluctuations in suicide deaths in the seven days following publication, compared with a control window. Among the characteristics that were most strongly and independently associated with increased suicides were details of online suicide pacts, in addition to the inevitability of suicide, asphyxia other than car exhaust, suicide by jumping from a building and a headline including the suicide method. Based on the outcomes, the authors recommend that reporting on suicide can have a meaningful impact on suicide deaths and that media professionals and outlets should consider the specific content of reports before publication.

Jiang et al. (2017) conducted an analysis of internet suicide pacts reported by the media in China. They reviewed 62 internet suicide pacts, involving 159

victims in mainland China before June 1, 2015. The people involved in internet suicide pacts were predominantly male (male-to-female ratio: 2.3:1) and more likely to be in the younger age group (84.1% were in their 20s to 30s). Most online suicide pacts (87.1%) took place in sealed hotels or rental housing, and charcoal-burning was the most prevalent suicide method (80.6%).

A Korean study of all tweets containing the term 'suicide pact' during a 43-day data collection period identified the platform, specifically, as a potential attractive place where people attempt to meet others to make a suicide pact (Lee & Kwon, 2018). The authors note that a significant proportion of tweets contained detailed information including the city of the user, their gender and age, favoured contact method, and preferred sex of an acquaintance. The authors claim the attractiveness of the platform for arranging suicide pacts may be due to specific features; for instance, a user can create several accounts with different names but without disclosing much personal information.

Pro-suicide and self-harm websites

A cross-national study among older adults, based on data from the World Health Organization and the United Nations website, found that internet use (including websites and chat rooms) for both males and females was significantly and positively associated with suicide rates in the 65–74 years and 75+ years cohorts (Shah, 2009).

A US-based study examining exposure to websites that encourage suicide discovered that young people who visited such websites were 'seven times more likely to say they had thought about killing themselves; and 11 times more likely to think about hurting themselves, even after adjusting for several known

risk factors for thoughts of self-harm and thoughts of suicide' (Mitchell et al., 2014).

Nevertheless, in contrast to these findings, Till et al. (2017) note that educative, professional, suicide prevention websites may increase suicide prevention-related insight and may be associated with a decrease in suicidal ideation among vulnerable individuals.

Suicide notes online

No studies that examined the impact of posting suicide notes online on suicide contagion and clustering were identified. However, Ruder et al. (2011) identified numerous reports of suicide notes on Facebook in the popular press, but none in the professional literature. Therefore, evidence of copycat suicides induced by suicide notes on social networking websites is unclear. In terms of suicide prevention, four studies were identified, which suggested that suicidal communications or suicide notes posted online may have positive impacts in that they may facilitate immediate intervention from other users (Ruder et al., 2011; Belfort et al., 2012; Cheng et al., 2015; Fu et al., 2013).

Discussion

Considering the limited number of available reviews that have addressed the impact of different types of media and media contents on suicide contagion and clustering, this review provides a detailed update on specific features of traditional media, online and social

media associated with suicide contagion and clustering.

Overall, we identified consistency in terms of both increased quantity of media reports and portrayal of specific details of suicide cases, including celebrity and fictional cases, to be significantly associated with suicide contagion and increased suicide rates or mass clusters with significant impacts on increased risk of suicide contagion within the first days up until the first three months following the media coverage.

The studies by Cheng et al. (2011) and Gould et al. (2014) provided further evidence for temporal clustering effects whereby the occurrence of a suicide and subsequent widespread and frequent media reporting increased the risk of further suicides within the following days, which is consistent with previous research in this area (Gould et al., 2003). In addition, continued sensationalist and poor-quality media reporting while an emerging suicide cluster had been identified may have contributed to further suicide cases during an ongoing cluster (John et al., 2017).

The studies addressing the impact of media reporting following the suicide death of a celebrity, consistently reveal increases in suicides or mass clusters, with increased risk of suicide contagion and mass clusters when suicides are glamorised and reported in detail. Across the studies, there was a stronger impact on suicides involving persons with similar characteristics compared to the respective celebrity or model

While much of the identified research focus on the harmful effects of media reports of suicide, we must acknowledge the role that mass media can play in suicide prevention, particularly through responsible reporting and portrayal of suicide.

in terms of gender, age group and suicide method (Niederkrotenthaler et al., 2012; Niederkrotenthaler et al., 2009; Pirkis et al., 2006; Jolley, 2006). However, research addressing the impact of the portrayal of suicide in fictional stories, such as the Netflix series *13 Reasons Why*, also revealed evidence of increased suicides involving other suicide methods compared to the method used by the protagonist (Niederkrotenthaler et al., 2019).

A possible explanation for increases in suicides or mass suicide clusters following the suicide death of a celebrity is grounded in the social learning theory (Mesoudi, 2009), which clarifies that identification of the imitator with the model is a necessary prerequisite of imitative behaviour. Niederkrotenthaler et al. (2009) showed that the celebrity status was the major predictor of a post-report increase of suicidal acts. However, there is increased risk of suicide contagion among young people who are more susceptible to imitation, in particular when the amount and duration of the exposure is intensified and ongoing (Santos & Gago, 2010; Hill et al., 2020). Additional risk-factors for suicide contagion including male gender, substance abuse, indigenous status, history of suicidal behaviour or experience of a traumatic life event have all been documented in the literature (Bohanna, 2013; Haw et al., 2013; Hawton et al., 2020). However, less is known about the influence of pre-existing mental health conditions, warranting further research in this area to inform suicide prevention and postvention efforts.

This review demonstrates that the impact of potentially harmful content and the portrayal of suicide and self-harm via internet websites and social media on suicide contagion and clustering is largely consistent with research into impacts involving traditional media. Implementation of media guidelines for reporting of suicide has been associated with a reduction in suicide rates (Niederkrotenthaler & Sonneck, 2007) and the use of highly lethal methods of suicide (Barker et al., 2016). The introduction of guidelines has also been associated with improvement in reader's capacity to use coping resources to overcome suicidal behaviour and ideation (Niederkrotenthaler et al., 2010). Therefore, greater priority should be given to the implementation of and adherence to media guidelines for the reporting of suicide for online and social media as well.

While much of the identified research focus on the harmful effects of media reports of suicide, we must acknowledge the role that mass media can play in suicide prevention, particularly through responsible reporting and portrayal of suicide. Traditional media content that encourages help-seeking and contains messages of hope and healing in the subject matter are considered protective effects (Hill et al., 2019).

Social media has been found to negatively impact the psychological health of users, particularly levels of anxiety and depression (Karim et al., 2020). However, it also exists as a mechanism for connectivity, offering a protective role in combating loneliness and social isolation. Although young people are typically less engaged with traditional media, given their increasing consumption of social media, there is potential for it to be used as a targeted suicide prevention tool (Rice et al., 2016). Social media platforms offer the possibility to intervene when suicidal ideation is expressed, and community support is available via online forums. However, challenges exist among privacy, consent, management of user behaviour and accurate risk assessment; therefore, research investigating the safety and efficacy of social media as a suicide prevention strategy is advised (Robinson et al., 2016).

This review has identified several gaps in knowledge surrounding the role and impact of suicide contagion and clustering, which would benefit from further research. Early detection of novel online risks

to mental health, such as virtual suicide ‘games’ targeting young people, is required and further research to identify emerging harms in real-time is needed (Sumner et al., 2019). Most articles regarding clusters identified as part of this review, related to suicide contagion and clusters. There is a paucity of research concerning the role of media in self-harm clusters and further research is warranted. Online and social media are constantly evolving, creating new influences and risks to mental health, often quite rapidly. Real-time research to identify the role, and risk to mental health, of these new media is needed. This review highlights that media may mediate the development of point clusters, and therefore, further research is required to explore the impact of the media on point clusters.

Strengths and limitations

Both strengths and limitations exist within this review. While a systematic approach was employed to the study design, the authors acknowledge that it is not a systematic review. One major challenge is that this research area is rapidly evolving, to the extent that research is constantly chasing new technological developments and methods of usage. Conducting literature reviews within such a fast-paced field of research poses difficulties, insofar as the literature can become out-dated rather quickly. A strength of this review represents the comprehensive literature search, addressing different types of media and media

contents and the impact on suicide contagion and clustering. However, a number of studies may have been missed, in particular non-peer reviewed research reports, which is a limitation.

Implications

Guidelines and protocols to support communities in managing clusters should be updated to reflect the extensive use of communication technologies in modern society (Fu et al., 2013; Robertson et al., 2012). It would be beneficial for guidelines to include preventative measures that a community should implement to minimise the potential for contagion using mobile phones and the internet (Swedo et al., 2020; Robertson et al., 2012), in line with initiatives in the UK and Australia (Orygen, 2020; Public Health England, 2019). Liaison with social media executives and search engine providers regarding opportunities for algorithmic detection of people engaging with pro-suicide websites and games, as well as increased promotion of support websites, would inform crisis intervention and facilitate help-seeking for people at risk (Lavis & Winter, 2020; Mitchell et al., 2014; Biddle et al., 2016).

While many jurisdictions have best practice guidelines for responsible reporting of suicide in the media, these alone may not be sufficient in reducing the effects of contagion. Greater enforcement of the media guidelines and governance of breaches by broadcasting safety authorities, combined with focused training for media personnel would be beneficial in ensuring greater adherence to sensitive and factual media coverage of suicides, thus reducing the hysteria instigated by sensationalised reports. The inclusion of guidelines for the reporting of suicidal behaviour in press codes of conduct for journalists warrants consideration.

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