Assessing the consequences of cyberbullying on mental health

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Assessing the consequences of cyberbullying on mental health

Advances in technology and the advent of social media have led to the emergence of a new phenomenon — cyberbullying. Although there are some similarities, approaches to tackling traditional bullying are largely ineffective in combating cyberbullying, which has been linked to adverse mental health and, in extreme cases, suicide.

Jean-Baptiste Pingault and Tabea Schoeler

In November 2016, Brandy Vela from Texas, aged 18 years, shot herself in front of her family after months of being a victim of cyberbullying on social networks[1]. Such tragic stories regularly hit the headlines, raising awareness about cyberbullying victimization (CBV) among the public, politicians and the technology industry.

The potential for harm of CBV is enormous: about 90% of young people in developed countries between the ages of 13 and 17 years have access to the internet, with a majority visiting social media platforms on a daily basis[2]. Although most young people are considerate users, Microsoft reports that about 37% of users aged 8–17 years worldwide report being victims of cyberbullying and 24% report being perpetrators[3]. The case of Brandy Vela exemplifies one of the potential consequences of CBV, which has been linked — in the most extreme cases — to suicide, but also to a range of mental health issues, such as anxiety and depression[4]. It is therefore urgent to deepen our understanding of the role of CBV in mental health and to offer adequate support to victims of CBV.

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Is cyberbullying different from traditional bullying?

CBV is a new form of victimization, defined as intentional and repeated aggressive acts that occur between a perpetrator and a victim who are unequal in power, through the use of communication technologies[4]. The first three elements of this definition also define traditional bullying (TB), or

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'offline' or 'real-life' bullying. Despite relying on technologies that were not widely available 15 years ago, cyberbullying is rooted in TB. Hence, the question arises whether CBV is distinct from TB or simply the same phenomenon occurring through different means. In other words, does the nature of the medium change the nature of the phenomenon?

Although evidence suggests that there is considerable overlap between CBV and TB[4], those findings do not rule out the possibility of CBV as an independent risk factor for poor mental health. First, CBV has several distinctive features. Victims of CBV are often targeted by anonymous perpetrators; the bully's identity is concealed, which prevents face-to-face contact that would make the immediate consequences on the victim evident to the perpetrator. Anonymity also means that the 'unequal

power' between the perpetrator and the victim is even harder to characterize for CBV than for TB. For example, a victim of TB may be repeatedly overpowered by the physical strength of a bully. Conversely, physical strength is unlikely to play a role in CBV, where other sources of power, such as number of online supporters, might be more critical. By use of social networks, cyberbullies can reach a larger number of victims than possible with TB. CBV can happen at any time and anywhere — there are no time or space boundaries, as is the case for TB — meaning that there is potentially no safe harbour for victims of CBV. Second, empirical support for a distinction between CBV and TB has been provided via confirmatory factor analysis: CBV was found to be distinct from other forms of victimization, such as reputational, relational, or overt

forms of bullying[5]. Third, the adverse consequences of CBV may persist beyond what is attributable to the experience of TB, as suggested by studies in which the association between the experience of CBV and emotional and behavioural problems remained significant when the influence of TB was statistically controlled for[6]. This high degree of co-occurrence between CBV and TB is of concern, since the combination of both forms of victimization could predict adverse outcomes in a cumulative manner. For instance, the largest adverse effects on mental health were reported following the experience of both TB and CBV, while smaller effects were present in those who were bullied only by one form or the other[7].

Is cyberbullying victimization associated with adverse mental states?

Small to moderate associations between CBV and mental health outcomes have been reported by meta-analytical studies (correlation coefficients ranging between $r = 0.09$ and $r = 0.27$)[4]. Extant research indicates that CBV is associated with a range of mental health issues, including behavioural and emotional problems, reduced self-esteem and substance use[4–6]. Although these findings highlight the potential harmful consequences of CBV, interpretations rely mainly on cross-sectional evidence, which prevents any causal interpretation. In other words, CBV is indeed associated with adverse mental health, but whether CBV causes adverse mental health remains unclear.

Causal risk effects of cyberbullying on mental health

A central question is whether the identified correlational relationships between CBV and mental health hold true if confounders and temporal relationships are considered. There is plausible evidence to suggest that victims of (cyber) bullying might already exhibit some pre-existing mental health issues. For instance, loneliness, depression and social anxiety were identified as risk factors for subsequent CBV and TB[8,9]. Such pre-existing vulnerabilities are genetically influenced, which could partly explain why recent research on TB has shown that the liability for bullying victimization is partly heritable, with up to 60% of the variation in TB being explained by genetic factors[10]. The same pre-existing vulnerabilities that contribute to increased likelihood of being bullied are also likely to adversely influence mental health in the long term (for example, pre-existing anxiety may lead to both exposure to bullying and subsequent anxiety). It is therefore essential to account for common genetic as well as environmental risk factors

that may be responsible for the observed associations between CBV and mental health, even in the absence of a causal relationship. To distinguish between causal and non-causal relationships, the use of quasi-experimental designs, including genetically sensitive designs (for example, twin studies), is essential. As recently reported, the relationship between TB and subsequent mental health outcome was partly explained by common genetic influences[11]. In this study, the application of the twin differences design proved a powerful method to account for gene–environment correlation (the genetic influence on environmental exposure), indicating that TB remained a risk factor for poor mental health outcome when the influence of genetic contributions and the shared environment was controlled for. Problematically, such evidence is not yet available for CBV.

Using structural equation modelling to examine temporal relationships, studies reported reciprocal relationships between CBV and both anxiety and depression[8,9]. This confirms that those with higher prevalence of pre-existing affective symptoms are also more likely to be victims of subsequent cyberbullying. Nevertheless, even after accounting for this effect, CBV still adversely affects subsequent mental health outcome.

Importantly, potential causal effects on mental health could be weaker or stronger in some segments of the population. In particular, certain protective factors can buffer the adverse effects of CBV. Such protective factors can derive from the family environment (for example, parental warmth), the social environment (for example, peer group support), the school climate, and personal characteristics (for example, biological make-up and psychological state). So far, evidence on whether individual characteristics can alter the effects of CBV is scant. Preliminary findings indicate that girls are at greater risk of presenting with depressive and anxiety symptoms after CB attacks[4,6], whereas in boys, the effect on behavioural outcomes might be stronger[6]. Findings on genetic sensitivity to the effects of CBV (that is, testing gene–environment interactions) are not yet available. As a more refined approach, future studies could include polygenic risk scores instead of candidate genes in their interaction models, to better embrace the potential aggregate effects of multiple genetic variants involved in victimization.

The accumulated evidence so far does not rule out the possibility of causal

risk effects of CBV. Investigations using quasi-experimental designs, such as the twin design, will be necessary to draw more confident conclusions. The current lack of evidence prevents us from formulating more empirically driven treatment approaches — work that is crucial to convince policymakers to fund or implement new interventions.

Limitations to preventing cyberbullying and the way forward

Preventative and treatment strategies are most likely to be beneficial when they are integrative (multilevel), that is, combining system-level and more individual-targeted approaches that tackle risky online behaviours while, in parallel, addressing potential pre-existing vulnerabilities. Among system-level interventions, those at a societal level will continue to be required to address prejudice-related victimization (for example, racism or disablism), which contribute to higher levels of victimization among children with protected characteristics. TB prevention programs typically target multiple systemic factors and include teachers, parents and the community. Since CBV — in contrast to TB — takes place online, tailored anti-cyberbullying initiatives can help children to develop healthy online behaviours. This could be achieved through the initiatives of care providers or even technology companies, such as the industry-led Cyberbullying Taskforce launched in 2016 (http://www.royalfoundation.com/duke-cambridge-launches-cyberbullying-taskforce/). Problematically, most CBV prevention programs developed so far lack an adequate empirical basis, or they formulate their treatment protocols based only on the traditional anti-bullying literature, leaving out the unique features of CBV — which may explain the limited success of CBV prevention programs evaluated to date.

Research on the effects of CBV is still in its infancy, and further empirical work is necessary to evaluate the consequences of CBV on mental health. Beginning at a more descriptive level, the quantification of the precise prevalence of CB victimization and perpetration remains challenging because there are substantial differences in the measurements employed by the studies published so far. Evidence on CBV is also limited by its reliance on prospective studies that assess the short-term consequences of CBV (between 2 and 6 months) in adolescents only (aged 14 to 18)[5,8], which limits our understanding of the effects of CBV in victims that are at different life stages and over the longer term.

Further research would also help to clarify whether CBV is linked to specific mental health outcomes or whether it represents a non-specific risk factor for psychopathology across diagnostic boundaries. In particular, there is a need for more research using causally informative designs in conjunction with experimental studies on plausible underlying biological pathways. This will help to identify causal risk factors for CBV and to understand how the experience of CBV might alter biological pathways involved in the pathogenesis of mental disorders. For example, there is evidence that CBV is linked to a dysregulation of the hypothalamic–pituitary–adrenocortical axis[12], the body's stress response system.

Increasing research efforts will also help to identify individuals who are at risk of cybervictimization, and those who are likely to be more resilient to its adverse effects. This will in turn generate insights into whether, for how long, and in whom the harmful effects persist after the cessation of bullying victimization. In conjunction, future research should focus on the unique features of the cyber-environment, which are likely to impact on the CBV–outcome association. For example, an individual's

risk of being a victim of CBV might be correlated to the amount of time they spend online, because greater usage exposes an individual to greater risks. Indeed, correlational evidence suggests that the amount of time spent on the internet is associated with a greater risk of being both a victim as well as a perpetrator of CBV[13]. Other potential online factors that have not been systematically evaluated might include the particular type of platform that is used (for example, Instagram or Twitter), the extent to which these platforms manage confidentiality, and the content that users upload, use and access. Generating deeper insights into these areas will be critical to the formulation of tailored CBV prevention and treatment programs that have the potential to reduce the harms associated with CBV. ❏

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Competing interests
The authors declare no competing interests.