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Social Media and Suicide

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Abstract

Today, online social media are as ubiquitous as they are inextricable, especially as they have become critical to every aspect of our everyday lives. In the face of this upsurge in social media use, particularly in the adolescent age-group, rates of suicide, attempted suicide, and deliberate self-harm have spiked. This chapter aims to elucidate on current-day definitions of these terminologies as well as their epidemiology regionally and globally. Furthermore, it explores any established causality as well as possible associations and contributory factors such as cyberbullying and substance abuse. The chapter also explores how trending issues such as celebrity suicide and suicide reporting have impacted on the prevalence of suicide and examines its comorbidities. Novel concepts such as the Werther and Papageno effect are highlighted. It explicates on present-day recommendations to curb this menace while also examining the possibilities and merits of using social media as a prohibitive and rehabilitative tool against suicidal behavior.

Keywords: social media, suicide, mental health, suicidal ideation, suicide prevention, suicidal behavior

1. Introduction

Over the past decade, suicide has gained prominence across all social groups as the world experienced a significant change in lifestyle with the rise in technological advancement. There is a significant change in the way humans connect and the way information is being shared. The advent of social media has sparked the popularization of certain terms and it serves as a go-to place for firsthand information on happenings all over the world. These come with a need for equilibrium in order to avert the dire consequences it poses on mental health and wellbeing. Unfortunately, social media usage has popularized the act of suicide both directly and indirectly, from its means of information sharing to the influence and consequences it has on emotional health. Social media have indeed resulted in an upsurge of suicide risk factors and suicide-related behaviors.

This chapter elucidates the existing affiliation between social media use and suicide. It also showcases the connection between social media and suicide on one hand and the potential of social media as a positive tool for wellbeing on the other hand.

1.1 Social media, its use and popularity today

In a world where there is a constant need to enhance communication and connect with people, it is only inevitable for humans to find means of easing the

process. The fact that man is a social being who does not exist in isolation spells out the importance of Communication to human survival. With the dawn of the information age, the internet era birthed a resolution to this dire human need of communication. The twentieth century experienced a surge in technological advancement, and this heralded the more sophisticated means of information sharing via social media. Social media are a platform or are platforms that make it possible to connect with other people all over the world by enabling communication through the sharing of content and information via a computer, a website or an application. The different platforms can be categorized base on the type of content being shared and the mode of sharing. There are now social networking sites like Facebook, Instagram, Twitter, Myspace, Snapchat, WhatsApp which provides an avenue for people all over the world to connect, communicate and share various contents in forms of pictures, videos, voice recordings, events, podcasts, web links and more. With this, people can share their day to day activities with family and friends. Although there is now a wide range of online activities that help ease work and day to day living, social media top the list as being the most popular online activity. From estimated statistics, the year 2018 revealed 2.65 billion constantly using social media worldwide. This statistic is also projected to increase to an estimate of 3.2 billion people constantly using social media in the year 2021 [1]. In Nigeria alone, 2018 statistics revealed an estimate of 29.3 million social network users which is projected to increase to an estimate of 36.8 million users in the year 2023 [1].

Social networking platforms now facilitates the ability to detect the happenings in the life of others even without reaching out, people are able to project the type of lives they so desire to be displayed for others to see even when it is dissimilar to reality. There is now the possibility of having a social media life where people's decisions are constantly being influenced by the activities of others. With these possibilities, come various gains as well as losses. Social media platforms are also a great source of news, information, entertainment, products, as well as tools for learning. Blogging websites, business directory, E-commerce website, informational websites, online communities and more are such veritable avenues for learning and obtaining information that people no longer have to physically present themselves in an educational setting in order to acquire skills. With the advent of such a video site as YouTube, there is now growing confidence in the opinion that anything can be learnt online. The advent of the internet and social media has indeed made life fluid. E-learning, E-commerce, E-banking, E-governance has changed the face of the world as it becomes more sophisticated and advanced. Social media have impacted the lifestyle of many from the way we develop social skills, relate to our loved ones, discover self and choose a career to the way we do business. There has been a significant shift and especially for the younger generation who are found to be the most avid users of social media.

A crucial point to note is the pitfalls which accompany the use of social media, it comes with experiences such as loss in concentration/motivation, comparison, lower grades, poor effects on physical and mental health, reduced social skills in real human contact, time wastage, wrong influences, quick access to vulgar information, internet Freud, cyberbullying and many more negativities. There is a prevailing irony with social media usage; could it be that the same medium which was created to ease social behavior might be the one destroying it? These evident factors demand that we get a full understanding of all precipitating and perpetuating factors of behavioral change due to social media usage, to find ways that balance can be attained. Indeed, social media are here to stay, hence; it is only important that humans establish means to unravel and unhinge its downsides.

2. Suicide and suicide-related behavior

Suicide is a calamitous act that calls to take antecedence as a major global health concern. It is simply the act of an individual ending his/her own life intentionally. According to other definitions, Suicide is defined as a death caused by one engaging in injurious behaviors toward self to die as a result of the behavior [2]. It can also be defined as purposeful behavior carried out either to manage or eradicate unbearable levels of pain in one's present life circumstances [2].

2.1 The burden of suicide

Suicide is a leading cause of death, particularly among young people. Suicide occurs all over the world in all regions, across cultures, economic and social status and indeed all age groups. Although suicidal behaviors might differ across age groups, sex and geographic regions, no human is immune to it.

Suicide accounts for high rates of deaths in all regions of the world today. According to the WHO [3], statistics reveal close to 800,000 who take their own life every year and this estimated amount differentiates from those who attempt that act alone which sometimes can be more. Suicide is also known to occur throughout the life span with the highest occurrence happening during adolescence. Suicide is the third leading cause of death among 15-19-year-olds. In America, suicide is one of the 10 leading causes of death overall and in persons within the age group of 10–64 years [4]. Every suicide is both an individual tragedy and a part of a public health crisis that imposes a great burden on society [5]. The burden of suicide reaches beyond the deaths themselves, extending to family, friends, and colleagues of the individuals who have died by suicide [6]. According to the Centers for Disease Control and Prevention [7] it is estimated that between six and 32 survivors (e.g. close family and friends) are personally affected by suicide mortality in terms of increased mental health risk, and this may include increased risk of suicide for the bereaved. Concomitantly, suicide results in financial burdens, costing society approximately US\$44.6 billion per year in combined medical and work loss costs [7]. Thus, the prevention of suicide has become a matter of paramount public health importance globally.

2.2 Risk factors

Suicide is preventable as it comes with lots of warning signs that, if detected early enough, can be cured. The more common cause of suicide known to many is depression. Although this majorly leads to suicide, many other factors come to play in explaining the cause of suicide. A combination of social, psychological, environmental, biological, medical and genetic factors could result in suicide. Various studies have been carried out in assessing the risk factors for suicide. Some risk factors associated with suicide are family history of suicide and child maltreatment, family history of alcohol/substance abuse and mental illnesses particularly depression, previous attempts at suicide, impulsive and aggressive behavioral tendencies, feelings of hopelessness, isolation, loss of loved ones, job or financial difficulties, physical illness, lack of access to mental health care, abuse, local epidemics of suicide, stigma and other factors that hinders one from seeking help [8].

In a study [9] on suicide trajectories, it was revealed that although mental illnesses as depression and anxiety result in Suicidal Behaviors across the lifespan, past and present studies have revealed that other factors as impulsive aggression, conduct disorder, interpersonal conflict, antisocial behavior, and alcohol and

substance abuse more prominently result in suicidal behaviors among adolescents and young adults.

2.3 Suicide related behavior

The suicide-related behaviors to always look out for are:

- Feelings of worthlessness and hopelessness
- Neglect of personal welfare
- Lack of interest in usual fun activities
- Irregular sleeping and eating habits
- Social withdrawal and isolation
- Overwhelmed feelings of pain
- Anxiety and irritability
- Suicidal ideation in which the individual engages with thoughts on how to end one's life
- Suicidal plan in which the individual makes plans and preparations toward ending his/her own life
- Suicidal attempt in which the individual attempts self-injurious behavior with an intent to die

Although suicide is commonplace globally, there is still an existing stigma associated with this act and with any form of mental illness in some parts of the world today. This often prevents those who are at risk from speaking up and from seeking help. A study [10] revealed that although there has been a reduction in the stigmatization of mental illnesses, suicide remains as stigmatized as ever. Many developing countries of the world today, including Nigeria, do not have meaningful statistical records of suicide and suicide-related behaviors. Because there is no proper record of deaths and their causes in most developing countries, it can be said that suicide rates are grossly underreported globally.

3. Social media and mental health

The relationship between social media and mental health is extant as social media are being linked to mental health problems like stress, psychological distress, anxiety and depression. In recent times, there is a rising research interest on this topic as research works carried out have established a link between mental health, lifestyle and social media. Social media have been linked to high rates of depression, anxiety and poor sleep, and research has revealed a 70% increase in depression and anxiety resulting from social media use in the past 25 years [11]. Other literatures have also described social media as being more addictive than substances like alcohol and cigarette [11]. There are now such terms as 'Facebook depression' which occurs as a result of spending so much time on Facebook and being exposed

to the intensity of online activities of others that one starts to exhibit depressive symptoms. FOMO—Fear of Missing Out is another issue of mental health concern that results from the constant use of social media. It is a form of anxiety aroused by the fear that others might be having exciting and rewarding experiences from which one is missing out on. It results in the constant desire to be everywhere events are taking place, the constant need to check one's phone for the latest updates, the obsessive desire to always stay connected with what others are doing [12]. FOMO often affects both mental and physical health, and it results in the feeling of inferiority, life dissatisfaction, mood swings, low self-esteem, loneliness, increased negative feelings and depression [12].

Social media also encourage attitudes that are unhealthy to mental health such as unhealthy comparisons, jealousy, emulations, and counterfeit appearances. Most people put up only the best version of their lives on social media and with this might torture others who follow them and aspire to be like them. It has encouraged the living of fake lives just for social media presence.

The change in lifestyle that results from social media use has become an issue of concern globally due to the rising rate of mental health disorders. It has become important for people to learn proper ways of using social media to their benefit and not otherwise.

3.1 Social media exposure: risks and safety

Social media and its effect on suicide related behavior have now become a topic of growing concern and debate [13]. The question that results is if social media help in suicide prevention or helps in increasing suicidal behaviors. Social media and the internet, in general, have helped in the advancement of communication, social connections, and businesses, which have helped make man's life better. This being the case, in promoting suicide prevention, social media come in handy as a powerful tool, as this same platform is now evidently being associated with enhancing suicidal behaviors especially among teenagers. The risk of social media usage today is now more associated with adolescents simply because they are the more vulnerable population who are likely to be influenced. The adolescent stage is a stage of significant developmental changes where there is an increased risk of experimentation and peer emulation, teens at this stage are trying to form an identity that leads them to be more susceptible to peer pressures. With adolescence comes the tendency to engage in risky behaviors which also explains why there is a high rate of social media misuse among adolescents.

There is no doubt that adolescents have a lot to benefit from the use of social media both socially, academically and personally. It helps in enhancing communication skills and connecting with others. They can experiment with self-expression, share ideas and learn from others. It also helps in developing new interests and skills as there are basic social and technical skills important to everyday functioning that are learnt through social media use [14]. Most adolescents utilize social media as an extension of activities and relationships that take place at school; with social media, they can build on their social skills and enrich their friendships [14]. With this, it can be said that teen deprivation of social media could take its toll on their social skills and learning experiences.

Social media also serve as a useful tool to reach people in crises by providing information, guidance, and support. In present times, the internet has been employed as a tool of intervention for those facing several types of mental difficulties. With social media, online resources/information, counseling/therapy, and support groups can be easily accessed. On the downside, there is the risk of accessing vulgar, distressing and negative information that affects more vulnerable people. There are now series of contents that not only encourage risky behaviors like

substance abuse, casual sex, sexting, pornography, inappropriate sexual behaviors, and suicide but also go out to attack or bully others into these behaviors.

4. Suicide risk factors associated with social media usage

4.1 Cyberbullying

This is also referred to as cyber-harassment or online bullying. It is a form of bullying or harassment that takes place online using electronic devices like mobile phones and computers and social media are the main platform often used in carrying out this act. In cyberbullying, the perpetrator harasses the victim by putting out negative, harmful and false posts, comments and contents about the victim [15]. It could also involve the perpetrator sending out private information about the victim to embarrass or humiliate the other party [15]. An eminent example is an act of cyberbullying that led to the death of a college student in 2010 called Tyler Clementi who committed suicide after a fellow student posted her private sexual encounter with another male student on social media [16]. Cyberbullicide is suicide which results from cyberbullying. Cyberbullying has led to suicide and suicidal behaviors among adolescents. Victims of cyberbullying are at a higher risk of experiencing self-harm and suicidal behaviors than those who are not [17]. Teenagers who experience any form of bullying including cyberbullying are at a higher risk of anxiety, sleep deprivation, poor academic performance, dropping out of school and depression [18]. It has been recorded that Seven in ten young people have experienced cyberbullying, with 37% of them saying they experience cyberbullying on a high-frequency basis [11]. Research [19] also revealed that students who experience any form of bullying and cyberbullying are twice more likely to attempt suicide. In a study [20], 33.8% of students reported that they have been cyberbullied in their lifetime while 11.5% admitted to having cyberbullied others.

4.2 Body image dissatisfaction

This can be defined as the feelings and negative attitudes a person has about their body and is usually influenced by certain factors such as the cultural norms relating to an ideal body, personal perceptions toward weight gain, and body appearance [21]. In a study [22] social media were revealed to influence the attitude of young women and adolescent girls causing them to engage in social comparisons which often leads to the feeling of inadequacy and body dissatisfaction. Concerns with body image lead people to depression and suicidal thoughts. Body image dissatisfaction occurs in both male and female although it tends to be more common in females, both genders are exposed to images online which they tend to fix as their perfect and ideal body. The activities and images portrayed by celebrities and social media influencers play a huge role in shaping standards for young people as they strive to emulate their admirers online.

Body image dissatisfaction often results in feelings of low self-esteem, depression, low body confidence, eating disorders. Results from a study revealed a link between suicide ideation and how both male and female adolescents perceive their body image [23].

4.3 Substance abuse

The link between social media use and substance abuse cannot be overlooked as social media are not only capable of pressuring one to use substances but also

provide a platform that eases the process of accessing hard drugs. Drug dealers now use social media to connect with their buyers all over the world which makes it easy to purchase hard drugs online. Adolescents through social media are being constantly exposed to the popularity of drug use, it has become commonplace to see celebrities display their use of hard drugs online [24]. The behavior of celebrities and social media influencers who glamorize and normalize the abuse of substances on social media goes a long way in influencing the attitude of adolescents who follow them [24]. Most adolescent engages in comparison with such social media influencers and by these, they begin to lose their values as they seek to emulate the popular behaviors they perceive online. Such social comparison could lead to depressive symptoms and other mental health difficulties which could in turn fuel the abuse of substances. The view that friends and fans on social media are having fun with their lifestyle can tempt adolescents into risky behaviors just to fit in. All these experiences are detrimental to mental health and can increase suicide risk.

4.4 Suicide contagion

This is a possible increase in suicide or suicide-related behaviors that results from exposure to information on suicide-related behaviors and actual suicide occurrences within one's immediate group. This form of information is often passed across through social media and can become popular within a very short time. The term 'Werther effect' explains a case of suicide that occurs as a result of a person copying cases of suicidal behaviors seen or heard of from various online platforms. Werther effect also referred to as copycat suicide and it explains the process of suicide contagion [16]. A person who has prior suicidal thoughts but is unable to carry out the act for several contingent issues of concern can suddenly become motivated to carry out the act after learning of another's case of suicide on media. The term 'Werther' was derived from a book written by Johann Wolfgang von Goethe titled 'The Sorrows of Young Werther', in which the principal character in the book named Werther, ends his own life by shooting himself at his desk [25]. After the book was published, several suicide cases were recorded with similar methods to the suicide case described in the book. This made it evident that the suicide cases that followed were influenced by that of Werther's character in the novel. Reporting of suicide cases especially celebrity suicide has popularized the incidence of suicide among the general public and it has now become very crucial that guidelines be adhered to, to reduce the popularity of suicide through Werther Effect.

5. Suicide prevention via social media usage

As has been reiterated severally, and with good reason, Social media have changed the world as we have come to know it, and this includes the mental health of the populace. The potential detrimental, stressor and suicidal capacity of social media use has been largely investigated and somewhat accepted. Dissimilarly, however, the potential use of online social media in suicide prevention is only in its infancy as it is only recently started accruing mainstream attention.

Logically, preventing any menace will center majorly on efforts to handicap its perpetrating factors, and in the same vein, involve an in-depth understanding of its underlying mechanism and attempting to impede it at any and several stages in its evolution.

Almost all cases of successful and failed suicidal attempts have a Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) psychiatric

illness. Mood disorders, principally major depressive disorder and bipolar disorder are associated with about 60% of suicides [26–28].

Consequently, any efforts at using social media to avert suicide must cater for mental health broadly; increasing its awareness, diagnosis and treatment alongside providing a means to access appropriate help.

Nowadays, in the age of the internet, young people can effortlessly access and share content across the globe in the snap of a finger using varying platforms including but not exclusive to collaborative projects (e.g. Wikipedia and social bookmarking), blogs and microblogs (e.g. Twitter), content communities (e.g. YouTube), social networking sites (e.g. Facebook, WhatsApp), virtual game and social worlds [29]. These avenues can and have been used by youth to find out about suicide and varying means of perpetrating it as well as making suicide pacts with other distressed individuals. Alas, fortunately, this provides an opportunity to find and intervene early if someone expresses suicidal intent as well as an avenue for people who have felt suicidal in the past to help persons currently feeling so.

In a small-scale internet survey administered by Robinson et al. they noted that respondents had identified social media as an avenue to provide support and equally receive help as relating to suicide, with the respondents acknowledging increased feelings of well-being by being able to help and support suicidal persons; the latter further accentuating previous reports that social media users found the ability to help therapeutic in and of itself. This beneficial reversibility of roles provided by social media is not applicable in one-on-one therapy. Another immense advantage of social media also highlighted by respondents was the potential to intervene swiftly if and when persons expressed suicidal intent online. Two previous studies cited this as a unique benefit of social media [30, 31]. One of these reports [31] described a successful intervention in a suicide attempt following the posting of a suicide note on Twitter.

A more representative and personal experience is shared by Reidenberg, the Executive director of the United States-based prevention organization Suicide Awareness Voices of Education (SAVE) [32].

Daniel Reidenberg was scanning Facebook for his suicide-prevention organization on a Friday evening in the spring of 2014 when he noticed the post of a clearly suicidal young widow who had declared the intent to take her life and that of her baby. As he had a wealth of experience working with Facebook and other digital companies on the prevention of suicide, he knew exactly what to do: he contacted Facebook's safety center. Although, there was no indication in the post of the woman's location, he knew Facebook would still be able to find her, and that they did in very few minutes. Facebook employees determined the woman had posted her message from an Internet café in a small village in South America. They contacted the local police. Holding a picture from the woman's Facebook page, police officers walked through the village. Within ten minutes of leaving the café, the police found were able to find her and get her into a hospital and get her childcare [32].

With 2 billion people using social media and 500 million people posting on Facebook alone, there is "a lot of opportunity for intervention and prevention," says Reidenberg. "It's critical that everyone starts looking at this new era with technology being involved in the field of suicide prevention. It isn't just going to a doctor's office any longer—it is that 'plus.'"

"In a few short years since some of the big social media companies began meeting periodically at Facebook's California head office in 2011 to brainstorm about what to do, the world's largest social network has rolled out a direct intervention. In 25 of the 50 American states, when a user posts a message on Facebook containing a phrase that its algorithms flag as indicating suicidal thoughts or intentions, a banner

pops up on the user's page. Friends viewing the post can also click on an icon that reports the message, sending it to the Facebook safety centre to review" [32].

The automatic banner asks whether the user needs help and provides the number of the National Suicide Prevention Lifeline. Facebook then contacts the user and offers to connect him or her to the distress line. The message includes tips and links to support videos aligned with best prevention practices. Facebook may also freeze the user's page until the person in distress has interacted with the support applications. The program is billed to be expanded to the entire country and is even said to be piloted in some undisclosed countries [32].

A psychiatrist has said that Facebook's program raises a 'thorny' issue as users can post content they don't intend to act on. Reidenberg acknowledged that companies are wrestling with the privacy issue, but he reminded the audience at the International Association for Suicide Prevention's annual conference in Montréal, Quebec, that once someone posts anything on a social media site—even if it's personal health information—it is no longer private [32].

6. Novel approaches to suicide prevention

Current efforts at suicide prevention center largely on reducing suicidal desire among individuals hospitalized for suicidality or being treated for related psychopathology. Such efforts have yielded evidence-based treatments, and yet the national suicide rate has continued to climb [33]. The contrast between the robust evidence base for several treatments and the continually increasing suicide rate points toward a vital disconnect between the primary problem and the tools we are using to address it [33].

Rightly so, new frontiers and novel approaches to suicide prevention are emerging by the day. One such compelling proposal was made by Michael et al. [33], who propose that this disconnect is heavily influenced by an unmet need to consider population-level interventions aimed at reducing the capability for suicide.

HIV death rates peaked in 1965, necessitating the need for national-level intervention strategies. However, one that was noted to have been quite effective was the needle exchange program whose aim was to reduce needle sharing, which at the time was the main means of contracting the disease. It also provided an avenue for counseling and health education on safe sex and intravenous drug use. A similar approach was employed to drastically reduce the incidence and prevalence of lung cancer by aggressive public education, increased taxation of cigarette companies, policies limiting places where smokers could publicly smoke as well as the introduction of cigarette filters. By the same token, vehicular accidents were massively reduced by laws imposing the use of seatbelts, child passenger safety and bans on alcohol consumption whilst driving.

Drawing from these largely successful interventions that quelled major public health concerns, Michael et al. resolved that a similar population-level means restriction approach be undertaken. They postulate that achieving a position of strength as regards suicide prevention will stem from a more adept understanding of the mechanism underpinning various aspects of suicide risk. A recent meta-analysis by Franklin et al has shown no increased predictive value of the past few decades of research examining traditional risk factors of suicide. Besides, research has shown that lots of people who think about taking their own lives, never do and the great majority who do try do not die by suicide. The failure of these traditional methods has led to a new approach in suicidology, "ideation to action framework", which has heralded the various psychological theories of suicide. Foremost and oldest amongst these theories is the interpersonal theory of suicide.

The interpersonal theory of suicide (ITS) [34] posits that individuals are at greatest risk of suicide ideation when they feel a sense of burdensomeness to others, lack a sense of belonging, and feel hopeless that these states will change. Although, the ability to make a suicidal attempt is acquired through exposure to painful and provocative events, such as experiences that heighten individuals' pain tolerance and fearlessness about death. Examples of such painful and provocative events include starvation [35], risky illegal behaviors [36], and combat [37]. Additionally, research has indicated that genetic factors may influence individuals' capability for suicide [38]. Conclusively, both suicidal ideation and suicidal capacity must be present for suicidal behavior to ensue [33]. O'Connor's Integrated Motivational-Volitional Model of Suicidal Behavior (IMV) [39] is another suicidal theory influenced by the ITS. Both the IMV and ITS have been empirically tested and supported [40]. Klonsky and May [41] have proposed and empirically tested the most recent of theory within the ideation to action framework, the Three-Step Theory (3ST).

All three theories posit that suicidal intent and suicidal capacity must be present for suicide to ensue. Although defined somewhat differently across each theory, they posit that for a suicidal or lethal attempt to occur, suicidal capacity must be in play. It is important to note that capacity is not in and of itself pathological, in actual fact it is beneficial and can be adaptive in the right circumstances. For instance, increased comfort with blood would prove beneficial to emergency doctors and nurses, likewise, an increased fearlessness of death would enable soldiers to complete a dangerous mission. However, in conditions where persons with an elevated capacity for suicide also experience danger and an increased suicidal desire, the odds for a fatal suicidal attempt increase substantially. Consequently, this offers a promising opportunity for the development of broader-scale national level preventive interventions that target suicidal capacity, even in individuals who deny suicidal thoughts. The most prominent example of such approaches currently in practice, albeit sporadically, is means safety [33]. Novel as this may seem, it's actually an age long, veritably tested and acknowledged measure as evinced by the significant reduction in suicide rates following reduced packaging and access to drugs known to be lethal in high doses, restriction of access to suicide hotspots (bridge barriers), detoxification of gas, ban on popular insecticides frequently used to execute suicide. This effect was witnessed in 2006 in Israel as the Israeli defense Force prevented soldiers from taking their firearms home over the weekend having noted that firearm suicide was high over weekends. As much as a 40% reduction was noted in suicide rates amongst soldiers aged 18–21 following the intervention. Literature, scientific and historical, is fraught with successful campaigns of means restriction/safety. Decreased access to and safe use/storage of lethal means might represent an opportunity to address an important aspect of the capability for suicide without diminishing the ability of individuals to succeed in their chosen professions and environments [33].

A reasonable concern among individuals first hearing about means safety is the possibility that limiting access to one specific method for suicide will simply result in individuals dying by another method. Importantly, this argument has been largely refuted by available research [33]. In his review of means restriction and means substitution research, Daigle [42] found little evidence in favor of means substitution. Similarly, Sarchiapone et al. [43] also examined the effect of broad-scale means safety efforts and found that means substitution was uncommon across a variety of methods.

The overwhelming evidence for means restriction and safety, as a means of suicide prevention, lends credence to the recommendation that it be promulgated into law. Whilst a few countries have passed laws and regulations encouraging means restriction, most are yet to. Social media advocacy can be a veritable tool to

ensure legislation of means restriction and safety globally, public education on the importance of the subject matter and ultimately shift public perception and cultural views on means safety.

Another budding and promising endeavor for the cause of suicide prevention, presented by recent advancements in science and technology, is 'big data'. Generally, big data is high-volume, high-velocity and high-variety data usually in its raw unedited format and coming from diverse sources. This large data set potentially offers scientists and researchers alike, the access to an unprecedented sample size to experiment and test hypothesis and published data. More so, analytics of text, images, videos, audio and social media information can be used to extract information, patterns, relationships and diversities which can in turn be used to predict suicide risk in varying demographics the world over. Additionally, this may also impel the development of online and app-based interventions to extend even to persons who are unawares of their suicidal capacity. One such app is Therapeutic Evaluative Conditioning, TEC, which aims to alter an individual's association with suicidal behavior. Although, caution has been advised with its use, it exemplifies the burgeoning opportunities the use of big-data will afford the world in preventing suicide.

7. The way forward-striking a balance between the risks associated with social media use and its capacity and potential use in suicide prevention

The media are a something of a double-edged sword as concerning its effect on mental health and suicide, making its use in suicide prevention fraught with a lot of danger; hence, caution must be exercised in this undertaking. Albeit, this chapter is replete with means by which the internet can be used to prevent suicide, it can also exacerbate suicide risk by glamorizing suicide or promoting it as a solution to life's problems. As elucidated by Pirkis and Blood [44, 45] and Gould [46], the latter could encourage distressed and suicidal individuals to actually attempt suicide or be drawn to suicide hot spots portrayed in various media. The Internet is of increasing concern, particularly the effects of suicide chat rooms, the provision of instruction in methods for suicide, and the active solicitation of suicide-pact partners [47]. Media blackouts on reporting suicide have coincided with decreases in suicide rates [48]. A 1987 campaign [49] to decrease media coverage of subway suicides in Austria cut subway suicides by 80%. This only goes to show how vital the education of journalists and reporters is, as well as the regulation of suicide reporting. The American Foundation for Suicide Prevention [50] and Annenberg Public Policy Center, and The Centers for Disease Control and Prevention [51] in the United States have produced guidelines for the responsible reporting of suicide; however, no published studies have evaluated their impact [47].

Additionally, in an online survey by Robinson et al. [29], most organizations that facilitated user-user interaction via their social media sites had trained moderators in situ; however, few had clear safety protocols or a code of ethics underpinning their work. The need for clear protocols and ethical standards for suicide prevention activities using social media platforms has been emphasized before [52]. The subsequent implementation of these guidelines will be an important step toward enhancing the safe delivery of suicide prevention initiatives using the internet [29].

Robinson et al. [29] identified the need for more interventional studies for persons at risk of suicide, and bereaved due to suicide; they also noted the need for additional research investigating the safety and ethics of delivering interventions via social media.

The unstructured, formless and anonymous nature of social media has constituted not only systematic but also ethical challenges for researchers and other stake

holders looking to use social media to curb suicide. It has therefore become something of a necessity that if this endeavor were to be successful, the development of methodologies that can be rigorously and aptly applied to researches that utilize social media as a platform has become imperative. In the same vein, service-related guidelines that will ensure the acceptability, utility, efficacy, and ethical standards of social media-based suicide prevention services must be formulated. In doing this, researchers must work more closely with agencies and organizations involved in using social media for suicide prevention to ensure the practical applicability of these guidelines as well as their implementation.

7.1 Media reporting and guidelines

Locally and internationally, researchers have shown that detailed and sensationalized reporting of suicide is associated with suicidal behavior especially in persons in the same sex-age demographics as the deceased even after accounting for reporting and methodological and reporting bias.

Following the release of JW Von Goethe's novel 'The Sorrows of Jung Werther', imitative suicides of young men across European countries were identified leading to the coining of the term 'The Werther effect'. Similarly, there was an increase of about 12% in suicide rates after the suicidal death of famous American model and actress, Marilyn Monroe. Numerous studies have shown that the copycat and imitation effects of media reporting are primarily found for vulnerable people, such as people with depression and those who have engaged in self-harm [53].

The provision and compliance with media reporting guidelines have heralded applaudable impact with reduction in suicide rates and use of lethal weapons. However, Bohanna and Wang report that media guidelines can be effective only when 'accompanied by media endorsement, active dissemination strategies and ongoing training and monitoring' [54].

8. Conclusion

The internet has heralded an age of global interconnection via social media and this wave of modernization has become ingrained in almost all human endeavors leaving an indelible mark of positives as well as negatives on the very fabric of society. In this time, suicide and suicidal behavior have snowballed especially amongst young people, the most avid social media users.

This chapter is replete with empirical evidence to disprove any coincidentally in this simultaneous pattern of events as well as establish that social media usage is associated with mental health problems such as anxiety, depression, etc. Phenomena such as cyber-bullying, body image dissatisfaction, substance abuse, suicide contagion and celebrity suicide that are caused or promoted by social media are contributory to self-harming and suicidal behavior.

We have examined the existing channels of suicide prevention via social media as well as the potential and novel avenues it presents for the prevention of suicide and suicidal behavior. Emphasis was placed on the use of 'big data' and appropriate reporting of suicide following laid down guidelines. A major talking point was the adoption of a new approach to exploring the mechanism of suicide and reducing the capacity for it.

Future priorities identified included more inquiry and research into the safety and ethics of delivering suicide prevention interventions online whilst developing and enforcing service-related guidelines. Additionally, legislative enforcement and media endorsement of suicide reporting guidelines should be acidly pursued.

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