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Suicide

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Contributors

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Meet the editor



Robert W. Motta, Ph.D., ABPP, is Professor of Psychology and director of the Child and Family Trauma Institute at Hofstra University, New York. He formerly served as the chair of the Psychology Department at the same university and is the founder of Hofstra's nationally accredited PsyD Doctoral Program. He has published more than 100 scientific papers and book chapters and has written two books: *Alternative Therapies for PTSD: The Science of Mind-Body Treatments* published by the American Psychological Association and *Altered: A Trauma and PTSD Casebook*. Dr. Motta is board certified in Cognitive-Behavioral Psychotherapy and Behavior Therapy. He is a former president of the School Division of the New York Psychological Association, is licensed as a clinical psychologist, and certified as a school psychologist.

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Preface

Suicide typically represents an act of desperation in which the perpetrator draws the conclusion that their situation is hopeless and that there is little to no chance of their circumstances improving in any appreciable way. This is not always the case. For example, there are times when one is faced with the likely probability of enduring a terminal and excruciatingly painful illness and rationally decides that they would not want to endure this agonizing future. A person might also choose to knowingly sacrifice their life for a purpose that they perceive to be more important than their own existence, as might take place in times of war or in sacrificial acts of extreme patriotism. There are many such exceptions. Most often, however, suicide is seen as a desperate act in response to utter hopelessness and despair. When one examines the personal attributes and circumstances of the person who commits suicide, major depression, schizophrenia, manic-depressive illness, and alcoholism are frequently significant contributors; but again, this is not always the case.

This book examines factors that are related to and contribute to suicidal acts while also evaluating interventions that might be of value in reducing suicide statistics. Among the many topics covered are neurophysiological, personal, environmental, sociological, emotional, religious, economic, drugs, and parasuicidal correlates as they related to suicidality. In addressing these many factors, one gains a greater depth of understanding of suicide and comes away with an increased knowledge of why an individual might engage in an act, which, to the outsider, appears both irrational and extreme. The authors' areas of expertise are both broad and deep and as a result, this book is a valuable reference for those who seek greater knowledge of suicidal behavior.

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Dalit Suicide an Emerging Social Problem in India

Avanish Bhai Patel and Sumant Kumar

Abstract

There are various kinds of discrimination is prevailing in Indian Society. India is practising discrimination against the lower caste for many centuries. But in contemporary Indian Society, caste-based discrimination is becoming a matter of grave concern for committing suicide. Caste-based discrimination is surviving in Indian society. In many cases of caste discrimination, Dalits were persecuted by the upper caste of Indian society for demanding education, employment, and equal social status. Every year several Dalits were committing suicide due to atrocities and discrimination. The present study will understand the nature of suicide among Dalits due to social discrimination and explores the factors affecting Dalit suicide. The data on suicide have been collected from 2011 to 2021 through various newspapers, magazines, journals and articles.

Keywords: dalit suicide, document analysis, social identity theory, India

1. Introduction

The identity of the Dalit community as oppressed or untouchable was identified in the early Vedic Period (c. 1500 – c. 500 BCE). Manu¹ in his Varna system (Manusmriti) categorises the Hindu community in ‘Chaturvarnya’ that divided the society into four distinct classes—Brahmins (priests), Kshatriyas (soldiers), Vaishyas (traders) and Shudras (menials).² The division of the society in India evaluated the principle of inequality that was legal and penal. The bottom position of the Shudras community identified as innumerable ignominies in the society, until the fifth division ‘Varna’ of the Untouchables came to the fore. The existence of the division of these classes in contemporary India is continuing due to abomination towards the Dalits community. The identity of an individual in rural India is still classified based on their caste. Due to all these factors, Dalit in India is considered as an oppressed or discriminated class and untouchable. Discrimination maintained by the upper caste in the society-outcast the Dalit community from the mainstream. Even in the rural villages, the Dalit community were not allowed to settle with other class. From ancient times they are not allowed to do equal work which other people do. Due to economically and socially vulnerable they follow the order whatever upper caste people assign to them. Division of discrimination created based on work and caste in ancient India is still surviving in Indian society.

¹ Manu, in the mythology of India, the first man, and the legendary author of an important Sanskrit law code, the Manu-smriti (Laws of Manu).

² Categorization of Hindu Community is defined under the book ‘Who Were the Shudras?; see in reference for more details [1].

Consequently, Dalits are committing suicide in contemporary times due to long history of caste discrimination in social and political institutions.

Dalit suicide as a social problem is a relatively new phenomenon in contemporary Indian society. Many studies [2–7] have been conducted over the years on student suicides that are associated with the Dalit community. According to the findings of these studies, Dalit students commit suicide as a result of social discrimination and a lack of opportunities in various institutions. We can think of a few students such as Rohith Vemula (2016), Muthukrishnan, (2017), Anitha (2017) and Payal Tadvi (2019) who have committed suicide as a result of social discrimination. These suicide cases have brought to light the worst form of Indian caste system that is still prevalent in democratic Indian society today. The number of Dalit suicides reported here is not representative of the overall trend of Dalit suicide. Dalits are being harassed everywhere in Indian society today, and this is a growing problem. They are sometimes harassed because of their social standing, and they are sometimes denied opportunities because of their social standing. They are so traumatised by all of the tortures and helpless take their own lives as suicide.

Dalits from Indian society are being increasingly committing suicide in a variety of settings, including educational institutions, the medical profession, and other occupations. Women from the Dalit community have also committed suicide in large numbers as a result of sexual harassment, as has been documented in numerous cases. Some of these Dalit suicide cases have been reported in leading Indian newspapers and can be described in detail. A Dalit doctor committed suicide in a well-known Delhi hospital as a result of his social status being overlooked by the people in his department, according to reports [8]. In a similar vein, in a district of Uttar Pradesh, a village-level officer was humiliated in the name of his caste, and after being insulted, he committed suicide [9]. In addition to this, in another instance, a Dalit girl who had been raped was not reported to the police station, and as a result, she committed suicide as a result of the mental trauma she had experienced [10].

1.1 Theoretical framework of Dalit identity and suicide

The term “social identity theory, “coined in the 1970s by social psychologists Henry Tajfel [11], refers to the conditions in which the social identity of an individual takes precedence over one’s personal identity. The concept of social identity was introduced through ‘social identity theory as a behaviour that can be used to understand the behaviour of various groups living within a society. Social identity theory [12] explains minimal intergroup bias as well as a broader statement of how social identity is related to relationships between real-world groups. Tajfel [13] suggested that it was the groups that people were associated with (e.g. social class and family) that significantly contributed to people’s self-esteem and pride. Groups form the concept of social identity, provide us importance and feeling of the social world. Additionally, he asserted that in-group (Upper Caste) of society (i.e. those of higher socioeconomic status) can persecute the out-group (i.e. those of lower socioeconomic status or Dalits) to maintain their social standing. A process of social categorization, social identification, and social comparison can differentiate groups from each other, creating what is known as an “out-group.“ The other group known as “in-group,” individuals can create similarities between themselves and members of their group. The central hypothesis of social identity is that “group members of an in-group will seek to find negative aspects of an out-group, thus enhancing their social status.” This theory states that there are three different processes, namely social categorisation, social comparison, and social identification, that act to promote the formation of a person or a group towards negative social identity when considering others within the out-group. This is an example of someone belonging

to upper caste people who discriminate against lower caste people based on their poor social, economic, and political status. Dalits due to their low status in society are defined and identified as marginalised, socially excluded, or untouchable. Due to all these social statuses, they are distinguished from other groups.

As an out-group, Dalits (a derogatory term for India's low caste Hindu people) experience various forms of discrimination from within society by upper caste people. Due to this discrimination, negative emotions, feelings of hatred and resentment, fuel their despair, leading to many cases of suicides among Dalits in India. Based on the social identity theory this paper further laid the discussion within the three theoretical division explained by Tajfel [11] why and how the social identity processes of the Dalits lead to their segregation from the rest of society under social categorisation, social comparison, and social identification. We can understand about Dalit suicide based on theoretical framework of social identity theory and status frustration theory through following diagram (**Figure 1**).

To know why the society was stratified because upper-caste already decided about who will get what, and how. From the sociological point of view, the division is made in the society according to rank, caste and class to explain what they deserve. Social stratification is interconnected with a form of inequality, that endure after-effects on the people who live in the society and can experience it. The division is based on what power, status or economic resources they are availing in the society. Based on the division they also limit individual choice including freedom and equality. The analysis of the social Categorisation of Dalit in Indian society is to trace how social inequalities are continuing and surviving, over lifetimes and continuing for generations.

1.2 Social categorisation of Dalit

Social Categorisation is defined as the tendency to perceive individuals and groups as socially distinct. Dalit is designated as the lowest caste group within the Indian caste system. The caste system divides people into social groups (castes) where assignments of rights are determined by birth (born in which class), are fixed, and are hereditary. This leads to the categorisation in the employment-based on the job assigned to them. To prevent anyone from breaking away from the caste system, we have an inflexible system of social ostracism (a series of social and economic penalties) in place Kumar [14] argues that Dalits have been classified in various ways, including as people who are distinctive in the Hindu social order. Historical background of social exclusion through Varna hierarchy made by the

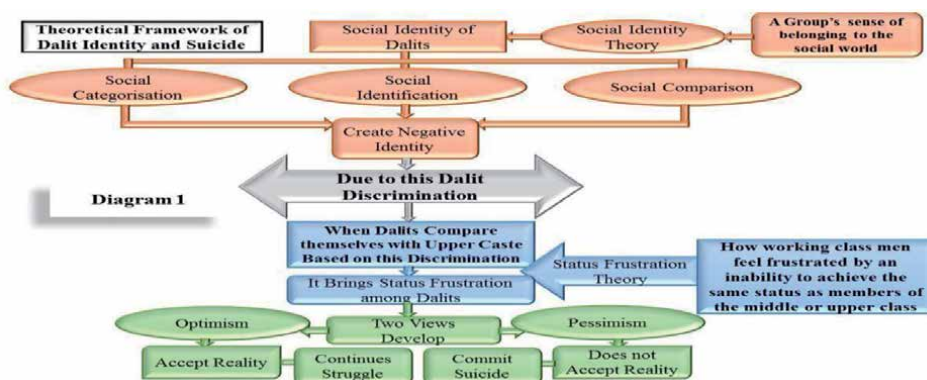


Figure 1. Dalit suicide theoretical framework of social identity theory and status frustration theory.

upper caste in the Indian society. They divided the social group based on their birth and status to lower caste and that is unchangeable.

Dalit community due to social Categorisation facing various kinds of discrimination which leads to committing suicide. The suicides cases were more noticed due to violations and discrimination in Employment, Education, Health sector. However, few individuals who were with their optimistic approaches overcome all the obstacle to claiming social equality. But the obstacle increased once they want to claim better opportunity in employment, education, or health facilities.

1.3 Employment

The dividing line of ‘haves’ and ‘have not’s in Indian society is not just based on economic but as well as for social factors. The congruence of deprivations only increases the disparity between the privileged class and the others. There is a real challenge in India for the Dalit community to the pursuit of equity in India. There are several suicides cases have been registered among Dalit participants as even after having good qualification and academic records they were not being selected for an academic post. For instance, a survey indicated that faculty belong to the lower caste/group (SC/ST) comprise only 3 percent of all the faculty at the Indian Institutes of Technology. There are 23 Indian Institutes of Technology in India in which 6,043 faculty are working but the contribution of the lower cast to the institution is only 149 faculty member [15]. This means merely 2.8 per cent of the faculty members come from the reserved categories. However, the employment reservation policy stipulates 7.5 per cent reservation for SC and it should be followed in all government appointments. In response to one RTI it revealed that in 2018 for the appointment in IIT and IIM³, 682 people applied from the SC and ST category of which just 16 were called for interview. An almost all the interview-based selection process are often under the control of upper-caste people, those still believe that how lower caste people will seat equally to them. Due to that most of the time in the appointment process, they make Dalit applicants ineligible.

Similarly, within the employment area, the Media sector is hugely affected with worse than the academic sector as Oxfam study reveals that “print and electronic are totally in the hands of upper-caste Hindus. Newslandry, a media watchdog, revealed that of 121 newsroom leadership positions across newspapers, digital media, magazines and TV channels, 106 are occupied by journalists from the upper castes”, and no one is from Scheduled Caste (Dalits) or scheduled tribe (Tribals) [16]. A similar study conducted by the Centre for the Study of Developing Societies in Delhi with surveying 315 editors, found that not one of them belonged to a Scheduled Caste (SC) or scheduled tribe (ST) [17]. It is a very clear message from the media sector that “Indian media wants Dalit news but not Dalit reporters” [18]. Apart from the media sector, there are other public and private sector which also maintain same. The employment sector in India has also noticed discrimination with Dalits and lower caste people. Inequalities with Dalits people have contained several factors such as illiteracy, unemployment, and health issue, social and economic status. The rich are getting richer, and the poor getting poorer is highly visible in India. Oxfam in his report mentioned that Income inequality gets worse as India’s top 1 percent bag 73% percent of the country’s wealth [18].⁴ Report on economic inequality stated that between 2006 and 2015, workers incomes merely

³ Indian Institutes of Technology (IIT) and Indian Institutes of Management (IIM) are Asia’s top level academic institution in India.

⁴ Oxfam is a confederation of 19 independent charitable organisations focusing on the alleviation of global poverty, founded in 1942 and led by Oxfam International.

rise by 2 percent a year while billionaire wealth rose almost six times faster [19]. Most of the labour class or workers class belongs to SC/ST or other backward communities, and they still lack basic adequate facilities such as; food, shelter, clothing, sanitation, health care, and schools for their children are major such issues. In the year 2019 itself reported 1,39,123 suicides in India, the suicide ratio increased by 3.4 percent compared to the year 2018. In which 23.4 percent of suicides contribute to the daily wages workers, mostly from the Dalit community.

1.4 Education

In 2019 the National Commission for Scheduled Castes Member Ms. Swaraj⁵ stated that even after appointment lower caste people and Scheduled Tribes and even Other Backwards Class people “faced discrimination and mental harassment” at IIT and IIM. Similar activity was noticed in the admission process of Dalit students as data provided by the Ministry of Human Resource and Development (MHRD) to the Rajya Sabha mentioned that “more than 2,400 students have dropped out from the Indian Institute of Technology (IITs) in just two years”, out of these, 371 were from the Scheduled Caste (Dalits) [20]. Socialist thinker Rammanohar Lohia, who even argued that “high-caste, wealth, and knowledge of English are the three requisites, with anyone possessing two of these belonging to the ruling class” [21]. To analyse this statement we can see that upper-caste monopoly is still clearly visible in of educational sector. Recently, a protest in Jawaharlal Nehru University was made against the fees hike because in recent years several fold fee hikes implemented in all education sectors which mostly affected the lower-income Dalits community, people such as farmer, a rickshaw puller, vegetable vendor, daily wages workers, contract labourer, etc. It observed that education will eradicate inequality in Indian society but due to unaffordable education, but it is not an easy task for the economically weaker Dalits community to achieve it.

1.5 Health

In the survey conducted by the National Family Health Survey (NFHS) on the status of Dalit women, which indicates that 70.4% had problems accessing health care. NFHS report in 2018 mentioned that “the average age when Dalit women die is 39.5, as against 54.1 for an upper-caste woman. In the continuity, it also stated that one in four Dalit women aged from 15 to 49 is undernourished, as per their Body Mass Index. Amongst upper-caste women, the ratio is one undernourished woman for every six” [22]. She also expressed that women from the Dalit community are lingering from most of the health policies and health care and due to that, they are dying at a younger age [22]. The fact is that the ‘untouchable’ word is labelled with Dalit people means that they have to face discrimination. A survey conducted on the Dalit community found that around 21.3 percent of the lower caste were denied to get entry to health centres. The survey also revealed that healthcare workers also denied to facilitates health services to 65 percent of Dalit communities. Due to that most of the Dalits are not having a choice but to go without healthcare [23].

1.6 Food

As per Dalit Bahujan Resource Centre around “22 percent of sanitation workers, manual scavengers and waste pickers did not have the 12-digit, biometric national identification number and 33% did not possess ration cards to get subsidized food

⁵ Ms. Swaraj is Federation of All IITs SC ST Employees Association.

through the public distribution system” [22]. Due to that their social and economic status continues degrading in the Indian society they were outcasted. For instance, a 13-year-old Dalit girl committed suicide after starving for two days in Lakhimpur Kheri district of Uttar Pradesh [24]. A Similar case of starving to commit suicide was noticed in Bundelkhand District of Madhya Pradesh in which 75 Year Sukhya hang himself due to not getting food and a Dalit farmer 62-year-old Samaydin Paswan hang himself due to poverty [25]. Locals told that he was not eaten anything for two-three days due to his financial condition gone very bad. However, it was not officially confirmed [26].

1.7 Social identification of Dalits

Social identification relates to the concept that people generally do not see the social status in the society and detached from it. In that situation, they compare their situation from the other upper caste and asked the question to himself “who am I”, “what are my status in the society” and they also relate or compare their status to other individuals and groups around them. In its most extreme form, the caste system manifests itself as untouchability, which is a pejorative for Dalits, who are referred to as “oppressed” “broken” or “crushed” in the extreme to the point of losing their original identity [3, 27]. Those who fall outside the caste system are considered as “impure”, “polluted” and “untouchable”, considered being inferior human beings. These labelled statuses on the lower group isolated them from the other upper caste group. Mahatma Gandhi renamed the untouchable Dalit as ‘Harijans’ means children of God. However, it did not provide equal status in Indian society.

The term “untouchables” is often used to refer to people who are forcibly assigned to do the most undesirable and unpleasant jobs, such as manual scavenging, clean human excreta, cleaning carcass of animals from the city. Due to the continuity of their engagement in all these dirty and polluted work, neither their economic conditions improved nor their social status. In addition, the polluted work forced to bear additional stigma in the society [3]. Data collected based on a survey conducted in India by the Gates Foundation found that “sanitation and cleaning work together contributes the employment of 5 million people, of which 90% belong to the lower Dalit sub-castes, on sanitation workers across India in 2017 [28].

Dalits since ancient India was economically marginalised as they were not allowed to go to school, temple, festival, and clinics. Bros have stated that “those who have long suffered from discrimination, may also suffer from a diminished self-image” [29]. Similarly, she also supported that the continuity of discrimination can reshape their self-perception, expectations, behaviour, and preferences within their arena. Due to self-discrimination and diminished self-image within social identity, they react to any collective action against the oppressor. Some individual, due to their self-dignity and self-image cannot tolerate the discrimination and commit suicide. For instance, an incident was reported in the Gaya District of Bihar where the upper caste youth abducted the Dalit girl who was coming from a birthday party. After the incident, the girl hangs herself to protect self-esteem [30].

Dalit suicides case is increasing among educated individuals. Discrimination towards Dalit people is inherent in every sector, school, colleges, University, Institution, Business, etc. Dr. Payal Tadvi a Dalit student was pursuing MD Gynaecology from BYL Nair Hospital in Mumbai. She committed suicide in 2019 due to their upper-caste senior colleagues allegedly harass with her casteist remarks. In a similar case, a 26-year-old Dalit student Rohith Vemula hanged himself in 2016 in the Hyderabad University, due to caste-based discrimination was alleged by the University administration [31]. All these practices banned by law in India, but it is

not hidden that the practice is still rampant in every States. To abolish caste-based discrimination, Indian is having several laws such as the Protection of Civil Rights Act 1955, the Untouchability (Offences) Act, 1955 and the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act 1989, Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013. However, these laws were still not implemented successfully in India. Even India is having National Human Rights Commission, National Commission for SC & ST but these institutions are vulnerable to take actions against all cases of Dalits.

Neither the society nor the State is believing in the protection of the rights of Dalit people. Most of the violations against Dalit people are not considered a violation of human rights. Untouchability is restricted in The Untouchability (Offences) Act, 1955 [32] adopted in India. Under this it is mentioned that untouchability is strictly prohibited if Dalit eats with other members of the society, not to be maintained separate seating arrangements in schools and other places, not to be denied entering temples, tourist places, shops, or using common village paths, for accessing resources such as common wells, ponds. Society cannot boycott them to perform their belief and purchasing properties.

1.8 Social comparison of Dalit

In the world of social comparison, the way “people define the relative value or social standing of a particular group, and its members through the process of social comparison” [33]. Dalits in modern India are still facing constant social comparison from the upper caste because of social stratification. The various socio-economic, cultural, and structural discriminations and disempowerments, influence the identification of Dalits in Indian society to expand the notion of caste under lower castes [33]. The Dalits, who have suffered discrimination for generations and whose socioeconomic status is perpetually marginalised [34]. The socio-economic conditions of the people who are excluded (those with low levels of education, poor health, and a lower income) have not changed, despite some improvement [34]. People are unable to work up to par, so they are labelled Dalits (also known as the “oppressed” or “the disinherited”) [3].

We can understand the elements of the process of social identity theory mentioned above that the Dalit community have always been excluded from the mainstream of society. On one hand, in the changing times, our constitution talks about the social justice of the Dalit community and also brings them to the mainstream of society. On the other hand, the Dalit community still boycott by society and compelled to live an inhuman life. The majority of people who belong to the upper caste society see the Dalit community with very disgraced eyes and abuse them in common public places.

The upper-class society maintained all the higher post in every social and statutory institution in which they humiliate Dalit candidates if they appear for the selection process. Whenever they find an opportunity insult them in the name of their caste. Such inappropriate and discriminatory behaviour of upper caste people creates the negative identity of the Dalit community in society. When the Dalit community see that the upper caste people have a negative and discriminative attitude towards them, then they consider themselves outside of the mainstream of society. Albert Cohen in the social frustration theory stated that seeing inhuman behaviour from the society, individual feel frustrated which creates negative thought (1955). The same is happening within the Dalit community.

Cohen is concerned with “class values such as achievement, individuality, ambition, and delayed gratification”, which applies to both the upper and middle classes (1955). Cohen postulated that “the values expressed here stem directly from middle- and upper-class socialization, thus they dominate the American value system” [35]. Unfortunately, these values are difficult to obtain by working-class people, because

of the socio-economic environments that working-class people are socialised in [36]. Society's standards of expectation and its resulting standards of outcome have left the working class disappointed and disgruntled. From there, a variety of mental illnesses appear, ranging from the most basic types of neuroses and psychoses to more sophisticated conditions such as psychopathy and various mental illnesses [36, 37].

This paper brings the discussion what steps are taken by the Dalits who feel frustrated due to discrimination and negative identity created by the upper caste for them in the society under the status frustration theory of Albert Cohen. The social discrimination and negative identity imposed on the Dalit community by the upper caste divided into two ways, (1) optimistic views (2) pessimistic views. Dalit individuals with optimistic views continue to struggle and fight to get their social honour by changing their discrimination and negative identity with time and circumstances. They believe that their struggle will reform the society will gain their equal status in the mainstream of society. However, the pessimistic views create negative thought in their mind, and they get frustrated due to social discrimination and negative identity. Such people are not able to struggle with time and circumstances and they find their future is dark in the current social system. These Dalit people are so mentally hurt that their desire to live ends and they commit suicide.

2. Document analysis method

The present study has applied the document analysis method (which is a kind of content analysis) for the study of Dalit suicide in India. It aims to a systematic examination of printed and electronic document material such as books, newspapers, journal, article, and magazines [38]. "Document analysis necessitates the examination and interpretation of data to elicit meaning, gain comprehension, and develop scientific knowledge" ([39] cited by [38]). Researchers use a combination of quantitative and qualitative analysis to identify the various words and concepts in a text, along with their meaning and relationships, and then make inferences about the text, the author(s), the audience, and even the time and culture in which the words were created [40, 41]. The author has decided to use this technique because the newspapers, magazines and other literature in India are the biggest and the best source of reporting on the problems of Dalits. The authors were able to easily gather data on Dalit suicide that occurred within a certain time using the method of document analysis. In nearly every instance, when there has been a Dalit suicide, the newspapers have not only reported on the possible reasons but also how Dalits are discriminated against because of their caste. The researchers used secondary data acquired from newspapers (both print and electronic) and magazines in India as the major source for this study. Secondary data for document analysis is gathered from Hindi language newspapers including Amar Ujala, Dainik Bhaskar, Dainik Jagran, and Jansatta, as well as English language publications like Hindustan Times, The Hindu and The Times of India.

Data has been collected from various states of India such as Bihar, Haryana, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh, and so on. Suicide cases of Dalit castes are widely publicised and highlighted in these regions, therefore it was imperative to study the current topic in these areas. According to the authors, the majority of the 50 reported cases of Dalit suicide were found in these regions. Each of these incidents of Dalit suicide has been divided into several groups, such as victims' age group (11–20 years, 21–30 years, 31–40 years, 41–50 years, and age unknown), gender (male and female), causes of Dalit suicide (social humiliation, fake cases of theft, sexual harassment, lack of basic needs and not available), and the occupation of the victim (doctor, student, farmer, officer,

journalist, labour and not available). This paper has collected all the information from various sources such as both print and electronic media, the author has applied the document analysis method for better understanding to explain the reason for Dalit suicide in India.

The data for this study was collected between 2015 and June 2021. The sample cases for the current study were gathered manually by reading each and every news section that was published on Dalit suicide and discrimination in the various newspapers and magazines that were referenced in the introduction. The researchers have identified the frequent terms used by Indian journalists to report such cases from offline publications, and these terms have been utilised to search for information on online platforms using the terms they have discovered. When looking for Dalit exploitation on the internet, look for terms such as barred, threat, entry, abuse, denial, stigma, attack, and discrimination [40]. The researchers then went through all of the search results and chose the cases where Dalits committed suicide as a result of social discrimination, which they then documented. The fundamental goal of employing this method in the current study is to gain an empirical understanding of the nature and pattern of Dalit suicide in Indian culture. Specifically, the researchers were interested in learning more about the effects of societal discrimination on the well-being of Dalit people and their communities. During the research period (from 2015 to June 2021), there were no alternative sources of empirical data available in India that could be used in the investigations, and collecting data through field visits was not feasible due to logistical constraints. This method of data collection was therefore deemed to be the most effective approach for collecting empirical data on the issue under investigation within the time period under consideration. This strategy enables the authors to conduct a scientific investigation on the Dalit suicide (observation, scientific view and fact examine) [40].

3. Results and discussion

3.1 Victims' sex

Table 1 shows that a total of 51 (63.75%) Dalit male has committed suicide as compared to 29 (36.25%) Dalit female has committed suicide. The study finds that most Dalit women have committed suicide due to sexual victimisation. There are few cases in which Dalit women have committed because of other reasons.

3.2 Cases of Dalit suicide in the last seven years

Figure 2 shows that the number of Dalit suicide cases has steadily increased over the last seven years, with an increase in the number of cases occurring every year. So far, the number of reported Dalit suicides has decreased only in the year 2018, with the highest number of 19 reported Dalit suicide cases occurring in the year 2020. Till May 2021, 9 Dalit suicide cases have been published in the print media.

Sex	Number of cases	Percentage
Male	51	63.75
Female	29	36.25
Total	80	

Table 1.
Victim's sex.

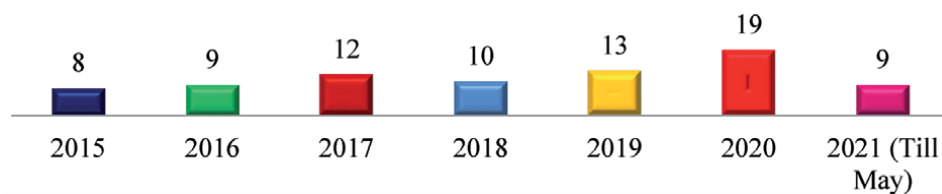


Figure 2.
Cases of Dalit suicide in last seven years.

Based on the number of Dalit suicides reported in the year 2020, it can be predicted that by the end of the year 2021, the number of Dalit suicides will have surpassed the number reported in the year 2020. These Dalit suicide cases have been collected from print media in 15 districts of 10 states across the country over the last seven years, and they represent a significant increase from the previous year.

3.3 Victim’s age group

Figure 3 shows that a maximum of 35.00% (28) Dalit people who belong to the age group of 21–30 years have committed suicide in India. While 27.50% (22) incidents of suicide belong to 31–40 year age group, 20.00% (16) incidents of suicide have been committed by age group of 11–20 years and 17.50% (14) individuals have committed suicide, who belong to the age group of 41–50 years or above age group.

If we add up the cases of Dalit suicide by age group of 21–30 years and 31–40 years, the number obtained is 50 (62.50%). This is a substantial percentage that reveals that the rate of Dalit suicide is more between the age group of 21–40 years. It should be noted that a Dalit person between the ages of 21 and 40 years is the one who struggles to come into the mainstream of society and who makes an effort to do so. This is the age group of the Dalit community who keeps some hope in his mind and thinks that when he gets his success then he will do some work for the upliftment of his family and community. But everywhere in the society whether they are social institutions, educational institutions or political institutions, he has to face social discrimination everywhere. This results in his hopes being dashed and him being bound to commit suicide out of desperation and frustration.

3.4 Victims’ profession

According to **Figure 4**, the majority of suicides among Dalit students are the result of discrimination and humiliation in educational institutions. There have been 25 such cases discovered, representing 31.25% of the total. Dalits who are in the medical profession, have been involved in approximately 15.00% (12) of

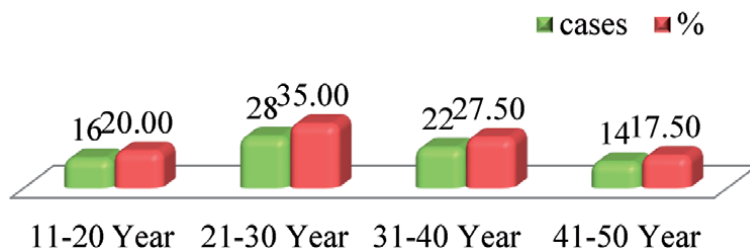


Figure 3.
Age group of Dalits during committing suicide.

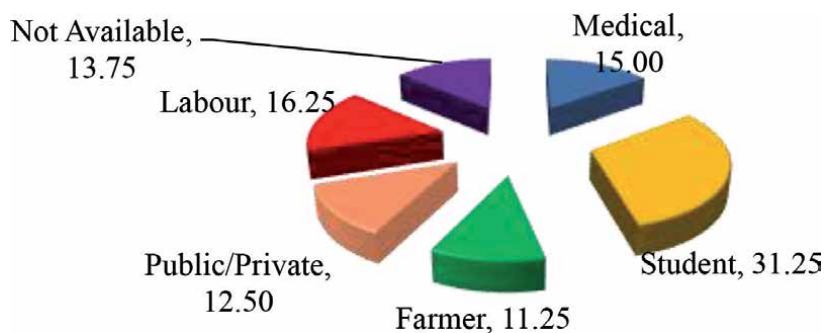


Figure 4.
Profession of Dalits during committing suicide.

the suicides committed, while Dalit labours have been involved in approximately 16.25% (13) of the suicides committed. Furthermore, according to the findings of the study, 12.50% (10) of Dalits who are engaged in the public/private sector and 11.25% (9) Dalit labourers committed suicide as a result of social discrimination and other causes. Furthermore, the study has indicated that in 13.75% (11) cases of Dalit suicide, the profession of Dalits is not available.

3.5 Causes of suicide

Figure 5 reveals that most of the Dalit suicide cases (42.50%) have been due to social humiliation, which is followed by several other factors that contribute to committing suicide, such as sexual harassment (23.75%), a lack of basic needs (12.50%), fake theft cases (6.25%), and no information on the causes of suicide in the remaining 15% of Dalit suicide cases.

It has been found from the analysis of newspapers that the people of the Dalit community face social humiliation daily. Sometimes they have to bear this humiliation in the name of their caste, and sometimes they have to suffer because of being ostracised from society. The people of the Dalit community have been facing this stigma of social humiliation for centuries. This stigma is prevalent in Indian society even after so many years of independence. The Government of India has made a provision for the right to equality in the fundamental rights of the Constitution to eradicate caste discrimination and the Constitution has also made a provision in the fundamental rights to eradicate social evils like untouchability. As a result of this, the Government of India did important work for the upliftment of the Dalit community by making a law to prevent untouchability in 1955 and 1989 made SC/ST Act to stop the atrocities against the Dalit community. But even after all these

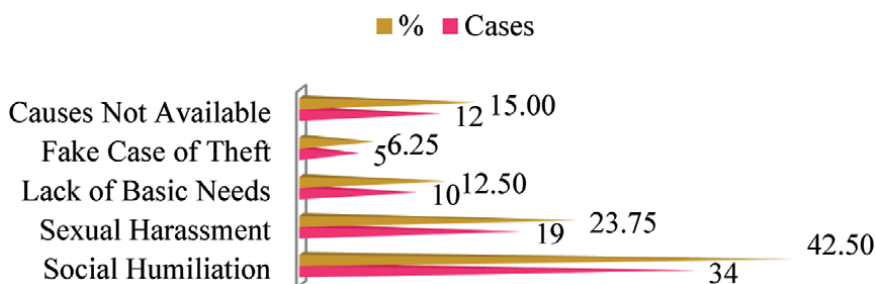


Figure 5.
Causes of Dalit suicide.

provisions, social discrimination is done against the people of the Dalit community. When the people of the Dalit community think that despite having these laws, social discrimination and atrocities are done against us and our community. Thinking of this they become sad and commit suicide. The study also found that there are many cases of sexual harassment with women from the Dalit community. When the women of the Dalit community raise their voice about the incident of sexual harassment with them, then their voice is not heard anywhere. Due to which they become so mentally weak due to sexual harassment and no hearing anywhere that became the to commit suicide.

National Crime Records Bureau (NCRB) yearly report mentioned that every year more than 1,00,000 people commit suicide in India. The causes of suicides mentioned in the report includes professional/career problems, isolation/distress, abuse, violence, family issues, mental disorders, alcohol addiction, financial loss, chronic pain, etc. However, there are several other causes are not included in the NCRB record which are still increasing in India such as Dalit Suicides, Migrant Workers suicides, etc. In the year of 2019, the rate was 10.4 percent with total number of 1,39,123 reported suicides cases in India. The ratio in the year of 2019 suicides was increased by 3.4 percent compare to the last year 2018 (1,34,516). The **Figure 6** illustrate that the various causes of suicides in the year 2019. The reason for the Dalit suicides is still not included in the NCRB data as the Dalit Suicides in India is not only happening with one reason but several.

The authors have analyses that the NCRB is not maintaining separate data of Dalit suicides in the yearly report due to several causes is the reason behind that. The author strongly believed that data on Other Causes and the Causes Not Know mentioned in the **Figure 6** comprise 21.4 percent of total suicides which includes the suicides cases against the Dalits people. Similarly, the causes of Dalits suicides also include Unemployment, Professional and Career Problem, Poverty, and Fall in Social Reputation which comprise 4.4 percent of total percentage. We cannot say that the all the reported cases include Dalit suicides only, but most of the suicides cases is with Dalit community only. The Dalit suicides is becoming an emerging issue in India. However, it is not getting attention due to government do not want highlight that still they are committing suicides due to discrimination and deprivation. The ratio with Students (7.4), Unemployed persons (10.1) and Daily wages earner (23.4) comprise 40.9 percent of suicides which can includes the economically poor Dalit community. A Survey conducted by the Centre for Study of Social

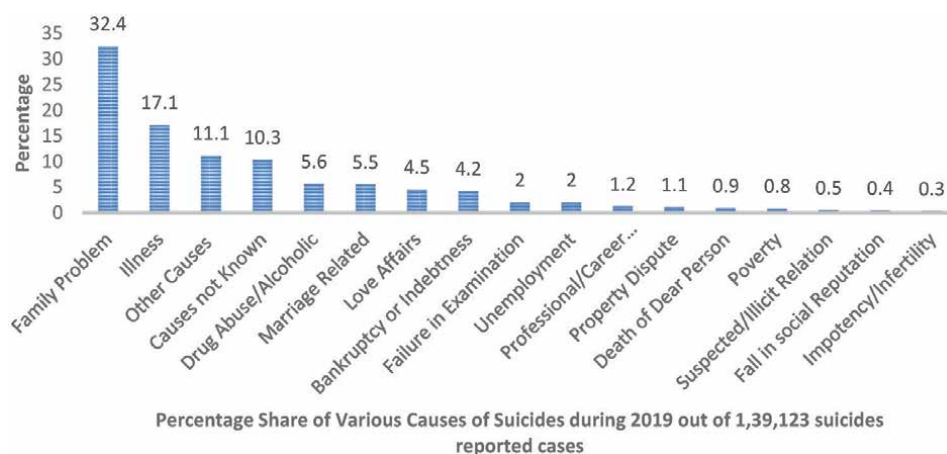


Figure 6. Percentage share of various causes of suicides during 2019.

Exclusion and Inclusive Policy (CSEIP) sponsored by the Indian Council of Social Science Research (ICSSR) in the State of Karnataka found that only 5.8 percent of rural Dalit households have government employees and about 7.7 percent families work in private sector ([42] October 28). The suicides cases with reason to the economic status includes 66.2 percent (92,083) those who are having annual income less than Rupees 1 Lakh. According to the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI)'s global multidimensional poverty index (MPI), 2018, every third (33 percent) Dalits in India are poor. If we compare the Dalit among upper caste in terms of poverty, only 15 percent of 'upper caste' people in India are poor [43]. United Nations Development Programme (UNDP) and the Oxford Poverty mentioned in 2010 report that two thirds of Dalits population in India are poor [44]. While the suicide rates among the educational status includes 23.3 percent (32,427) victims with illiterate people 12.6 percent (17,588) and with graduate degree 3.7 percent (5,185) out of 1,39,123 victims. The literacy rate among the Dalits shows that 80 percent of man and 64 percent of female are literate in India. However, there is no definition of literacy in India, those can write their name they are considered as literate. Most of the literate elder Dalit poor people never went to school. The other such reason for highest illiteracy rate among Dalits is increasing dropout rate from school due to their poor economic status, discrimination in school, not allowed to enter in school etc., and due to socially outcast by the upper caste. In 2019 Dalit children dropout from school was 81 percent for 6–14 years age group and 60 percent in 15–19 age group and it increased among 20–24-year age group in higher education [45].

There are around 160 million Untouchables in India, numbers are uncertain, but are from reliable sources [46]. Due to the lack of social and economic opportunity provided by the Upper community to the Dalits community they are deprived of literacy, health, education, and equal status in Indian Society. Violation against Dalits rarely come in the news as they believe that Dalits, get what they deserve. The stigma of untouchability entails a distinctive form of suffering that pervades all aspects of everyday's life and encompasses the present, past and future. Many laws were implemented to uplift the status of the Dalit community but still failed to ensure social equality. Even though social reforms hardly able to change the perception/behaviour/mindset of the upper castes society to recognise the rights of the Dalit community. Several time violence against Dalit peopled gained international media attention but till date, there is no such international conventions or treaties has been introduced those specifically covered problems of Untouchability or Dalit community. Some individual Dalit people are changing their surname or converting to other religion to protect themselves from the atrocities. But even upper caste people targeted Dalits for changing their names and religion.

However, sometimes optimistic thought led to violent incidents with the Dalit individual. Many such incidents were noticed in which Dalits being targeted when they tried to act like a normal individual in society. Several beaten to death incidents were reported in India when Dalit individual wear sandals, ride a bike, climb on a horse during a wedding, doing inter-caste marriages, for entering in temples, for cooking and serving in school, or to sit on a chair in the presence of upper castes. Now, the Dalit beaten to death news is common in every news headlines. After being beaten for plucking leaves for goat, due to disappointment over the act 26-year-old Dharampal Diwakar Dalit youth committed suicide in Fatehpur District of Uttar Pradesh [47, 48]. Beaten for taking upper-caste surname, The Dalit youth Bharat Jadhav was beaten due to having a similar surname like upper caste, he said that "Due to the lockdown all the colleges are closed, and I had come to Sanand from Saurashtra to earn some money. But I didn't know that my habit of

keeping my surname and shirt buttons open would get me in trouble and I would have to quit my job” [49].

Sometimes those who survived to continue face humiliation from society which lead to committing suicide. Dalits face various types of humiliation and subjugation if they want to register their cases against the upper caste people in a police station or want to claim social equality. In many such cases when Dalit people have filled any complaints against the upper caste was not entertained by the police. Rather than taking their cases, they threaten Dalit people for their action, in many cases due to lack of support from the administration incident of suicides has occurred. There are several examples is there in which rape victims committed suicides due to their cases were not taken by the police officials or society neglected them. For instance, gang-raped victim 32-year Dalit woman commits suicide in Narsinghpur district of Madhya Pradesh due to the police did not register a case against the economically poor Dalit women for the last 3 days [43]. In a similar case gang-raped victim beg to police to register her case in Chitrakut district of Uttar Pradesh. But due to not file the case against the culprit, a 15-year-old girl hangs herself in the home. After those police started the investigation. Most of the cases happened due to upper caste police official has captured the higher post in the police station and they hardly bother about the lower caste cases due to pressure from the upper caste society [50]. Such as a case in Guna District of Madhya Pradesh, a Dalit farmer couple committed suicide due to police brutality. The police official was destroying the standing crops of the farmer to clear land during an anti-encroachment drive, when couple requested to stop them, police brutally beaten the couple with sticks and both Rajkumar Ahirwar (38) and his wife Savitri (35) in front of the police and their six children drank insecticide [51].

The status of Dalit women is worse in India, the Devdasi system⁶ is still carried out in many southern states in India. In many places if any women will be stood for their rights they will be stripped, naked paraded in front of the public or gang-raped. Indu Agnihotri from the Centre for Women Development Studies stated that “the NCRB data also suggests that more than four Dalit women are raped every day”. Ranjana Kumari of the Centre for Social Studies expressed that “If you are a woman in India and poor and a Dalit—then there is no position worse than that.” The National Campaign on Dalit Human Rights, an NGO, mentioned that “more than 23 percent of Dalit women report being raped, and several have reported multiple instances of rape”. “Many perpetrators commit sexual crimes with a sense of impunity”, said Mariam Dhawale, general secretary of the All-India Democratic Women’s Association [52]. An example can be taken with the case in the Hathras where not only police ignorance can be seen but also shows that how they treat Dalit related case. A 19-year-old Dalit woman was raped and brutally murdered by the upper caste people in the Hathras district of Uttar Pradesh. Their family immediately rushed to the nearby Chandpa police station. However, rather than registering the case, the police official misbehaves with the family members. Including that without informing the family members the police officers forcefully cremated the victim at night. Due to pressure from the upper caste people police officer also compromised with all medical test and forensic evidence. Over the countrywide protest on the Hathras case, the UP

⁶ Devdasi system is a religious practice whereby girls are ‘married’ or dedicated to god at a young age. It is generally marked by muttu kattuvudu, a ritual in which a neck chain with beads is tied to the girl. These Devdasis, meaning ‘servants of god’ in Kannada, are not allowed to marry, stay alone or with parents, and make a living on their own. Essentially, this regressive system forces women into a lifetime of sexual slavery. And, girls from scheduled caste and scheduled tribe communities are the victims of this exploitative system, for more details visit URL:<https://www.deccanherald.com/servants-god-no-end-their-704825.html>.

government washed their hand saying that the cremation was done at night “to avoid large-scale violence”. But, the fact is that in India Dalit community always compromised with all these cases as the upper caste people still suppressing them at all levels.

4. Conclusion and suggestions


In contemporary India, Dalit Suicides has increased their ratio compared to the earlier times. The reason behind the Dalit suicides cases was earlier mostly due to Social Categorisation in the Society based on employment, education, health etc. However, the present paper has found that in recent suicides cases has been more increased due to the Social identification of Dalits and Social comparison. The Indian constitution provided reservation for the marginalised Dalits to attaining education and get better jobs opportunities. However, getting education and jobs by the Dalits community through reservation was not welcomed/promoted by the upper-caste society as they equally standing with them. This paper also found that society has to play a major role rather than the executive, legislative and judiciary system. Until unless the behaviour of the society will not change their perspective towards the Dalit community we cannot expect that they will claim equal opportunity through education and employment. The state, media, police administration, and society all are equally responsible for discrimination against the Dalit community in the society, which became the reason for an increasing number of Dalit suicides cases.

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Suicide: A Public Health Problem in Brazil

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Abstract

This text focuses on the situation of suicide in Brazil, defines and quantifies information, and presents a description of the main risk factors, as well as a reflection on the phenomenon and the possibilities for prevention. Fatal suicide is a serious public health problem. In 2012, 172 member states of the World Health Organization registered 804,000 self-inflicted deaths, representing an annual rate of 11.4/100,000, of which 15/100,000 men and 8.0/100,000 women. Consummate suicide rates are unevenly distributed globally, within countries, according to sex and according to age groups. The mortality rate is highest in Asia (17.7/100 thousand inhabitants), followed in Europe (12/100 thousand inhabitants). The Americas have a mortality rate of 7.3/100 thousand inhabitants (WHO, 2014). In Brazil, with an unevenly distributions between the regions, gender and ages, the total rate is 4.5/100,000. In the country and everywhere, risk factors are classified as medical, psychiatric and psychological, micro social, social and environmental. The history of the occurrence of suicides shows that it is possible to prevent them and to reduce the incidence rates. This requires investment in local diagnostics and multidisciplinary action. Given the delicacy of the problem and the taboos that surround it, the protection network for people at risk for suicide needs to be constantly in the process of training and taking action. As national and international surveys show, at least two-thirds of the individuals who tried or committed suicide had somehow communicated to friends, family, acquaintances or health professionals their intention to kill themselves.

Keywords: fatal suicide, suicide attempts, suicidal ideation, risk factors, prevention

1. Introduction

Suicide is an intentional act to end one's own life, which usually occurs in the face of such intense suffering that the people only see their death as a relief. In general, a self-inflicted death occurs after the individual has already demonstrated various types of suicidal behavior, ranging from *self-harm*, *ideation*, *planning one's death* to attempts that may or may not be fatal [1]. In general, the boundaries between *self-neglect*, *suicidal ideation*, *suicidal behavior*, and *completed suicide* are blurred since an attempt can be interrupted and become a fixed idea or intention. At the same time, a thought can erupt with overwhelming anguish and anxiety and explode in a life-termination act. However, experts warn that not every thought about death or the wish to die is evidence of some suicide risk [2].

Suicide is among the ten leading causes of death globally - more than 800,000 people take their own lives each year. This is the second leading cause of death

among 15-to-29-year-olds and the first for girls in the world [3]. The global mortality rate in 2012 was 11.4 per 100 thousand inhabitants, and was higher in Asia (17.7/100 thousand inhabitants), followed by European countries (12/100 thousand inhabitants). The Americas have a mortality rate of 6.1/100 thousand inhabitants. Brazil ranks eighth in the number of suicides and has, on average, 24 self-inflicted deaths daily. According to international consensus, the number of attempts is 10 to 20 times higher than the number of deaths. There is evidence that only 25% of those who try come into contact with hospitals, and those who reach these institutions are in a severe condition [3]. The reported cases are the tip of the iceberg, and most of those with suicidal behavior remain anonymous: this can be seen by underreporting in any searched official source.

Besides the adverse effects that a suicidal event generates to the community and society, its psychological impact is intense, even for those who have no direct connection with the individual who died. From the viewpoint of economic costs, millions of dollars are spent due to completed suicide, attempts, and ideas (around the equivalent of 1.8% of the total expenditure on diseases in the world or the operational cost of war). Gender, age, culture, and ethnicity have important implications for the epidemiology of suicide, as will be seen in this review. Several risk factors are associated with different causes that interact with each other, including medical, biological, environmental, psychiatric, psychological problems, and existential-philosophical and social motivations.

Among the biological factors, some research reveals genetic traits that predispose people from the same family to self-destructive behavior, showing altered levels of serotonin metabolites in the cerebrospinal fluid of people who committed suicide. However, the WHO [1] considers that suicidal behavior may be an inherited psychiatric disorder and not a genetic predisposition. The most common psychiatric and psychological risk factors are depression, bipolar mood and affective state issues, schizophrenia, anxiety and personality disorders, alcohol abuse, hopelessness and loneliness, and comorbidities. Depressive diseases in their varied complexity, etiology and clinical presentation [4] are the most relevant risk factor for suicide.

Poisoning with stimulants such as cocaine, amphetamines, or alcohol are frequent predisposing factors for suicide and aggravating when someone is depressed. Anticonvulsants can also be associated with suicide and suicide attempts when there is a broad-spectrum indication for patients with psychiatric problems with or without psychiatric comorbidities, as has been warned by drug control global agencies, including the FDA [5].

The most relevant micro social factors for suicidal behavior are some life events that emotionally affect the individual: personal losses, violence, social isolation, interpersonal conflicts, interrupted or disturbed relationships, and legal or work issues. Also, physical and sexual abuse and problems with sexual orientation weigh heavily in childhood and adolescence. Authors point out the difficulties in relationships with parents, fights with boyfriends, and loneliness among young people, as will be seen in this review.

In his classic book "Suicide", published in 1897, Durkheim [6] highlights the social reasons for this act. He believes suicide is a symptom of social pathology and social disintegration. This phenomenon exists in all societies, although it differs from country to country, from time to time, and from an urban to a rural environment. The WHO [1, 3] divides the environmental factors associated with suicide into three categories: (1) life stressors: interpersonal conflicts, separations, rejections, losses, financial and work problems, and shame for something socially disapproved of; (2) ease of access to means that enable hanging, drowning, falling from a height, the use of firearms, and abuse of medications and poisons; and (3) exposure to spectacular cases, due to neighborhood or media effects.

The study on suicide and attempts by Brazilian researchers and especially by public health grew significantly in the first decade of the 2000s. In a survey carried out by Minayo et al. [7] on the country's production – related to violence and including self-inflicted deaths – until 1989, papers and theses on suicide did not reach ten publications. A second general review also on violence and health identified 32 works on suicide [8] from the 1990s to 1999. Many similar results are observed comparing the findings of a comprehensive review of 2017 [2] with the two previous studies of 1990 and 2003, such as the signs of self-destructive situations, the risk factors, and the methods used to trigger the self-inflicted death or for attempts to do so. However, advances are observed, particularly concerning the number of studies (73), a trend towards increasingly complex analyses and groups analyzed. Regarding professional categories, the highlights of the review presented in this chapter are police officers, bank workers, and rural producers, while medical students, domestic workers, and workers in the electrical network were found in the previous study. Most publications (40.8% of the total) address an overview of the issue, bringing its magnitude by age groups through local or national statistics; studies on risk factors, including socio-demographic factors, alcohol use, and mental disorders.

Data from the Surveillance System for Violence and Accidents (VIVA), the Forensic Medicine Institute (IML), health services, and epidemiological surveys are the primary sources of information. The second group of texts addresses children and adolescents (23.7%), where practically all publications concern adolescents. Next are documents about older adults (19.7%) and adults (15.8% of the total).

Besides the strong presence of epidemiology in studies on suicide and suicidal behavior, the following thematic lines are found in all groups analyzed in the collection: (1) attention from health services facing the problem, also addressing prevention strategies; (2) the biological component related to the suicide attempt; (3) the consequences of the phenomenon for health (in the case of attempts) and the suicide's family; and (4) the methodological aspects to study the theme.

The study on the magnitude and risk factors is the main focus of investigations. However, it is noteworthy that publications in public health and psychiatry journals suggest an interdisciplinary theoretical framework that covers clinical, environmental, and social aspects in understanding the phenomenon.

While Brazil is not a country with high suicide rates, when looking at the general data, we observe a growing trend and several niches in which this phenomenon is troubling: among young males, young adults, and older men. The problem is also more concentrated in some places, particularly in the south of the country, with the preeminence of municipalities in the inland Rio Grande do Sul and Santa Catarina. The rates are also relatively high in the Northeast, particularly in Piauí and in some cities in the region. The scarcely studied indigenous group deserves special attention, as the fatal suicide rate among young people reaches 17 cases per 100,000 inhabitants [2].

Given the theoretical framework exposed, this chapter aims to describe the magnitude of suicide self-inflicted injuries and suicide attempts and suicide mortality in Brazil, and point out prevention policies concerning this event, as recommended by the World Health Organization [3].

2. Methods

A descriptive study was conducted with data referring to self-inflicted injury (which includes self-harm and suicide attempts) and suicide mortality in Brazil. The notifications of self-inflicted injuries were taken from the Surveillance

System for Violence and Accidents – continuous component, which is registered in the Notification System for Notifiable Violence (VIVA SINAN) from 2011 to 2019. In Brazil, the notification of interpersonal and self-inflicted violence became compulsory in 2011.

Data referring to the Mortality Information System (SIM) from 2000 to 2019, whose source is the Death Certificate, were used to analyze suicide mortality. Were selected deaths whose underlying cause was related to codes X60 to X84 (intentional self-harm) according to the International Classification of Diseases – 10th version (ICD-10).

Self-inflicted injury notifications were analyzed by gender, ethnicity/skin color, age, the federal unit of occurrence, whether the attempt had already happened before, suspected alcohol abuse, place of occurrence, and means used for self-harm.

The completed suicides were analyzed by gender, age group, ethnicity/skin color, federated unit, and place of occurrence. Moreover, mortality rates (per 100 thousand inhabitants) were calculated employing the population data (Projected Brazilian Population by gender and simple age: 2000–2060), extracted from the website of the Informatics Department of the Unified Health System (DATASUS). All analyzed data is in the public domain.

3. Results

3.1 Self-inflicted violence in Brazil

A total of 2,185,782 suspected or confirmed cases of violence (interpersonal and self-inflicted) were reported in Brazil from 2011 to 2019. Twenty-one percent (460,611) of these referred to self-inflicted violence (**Figure 1**).

During this period, cases of self-inflicted violence increased from 14,940 in 2011 to 126,678 in 2019, equivalent to a percentage variation of 728% (**Figure 2**). This increase in the phenomenon was observed in all Federative Units in the country (**Figure 3**) is due to ongoing work by the Ministry of Health's Coordination of Surveillance of Non-Communicable Diseases and Injuries to improve the notification process. Therefore, it suggests greater sensitivity and training of local teams to record injuries caused by violent events, including suicide attempts.

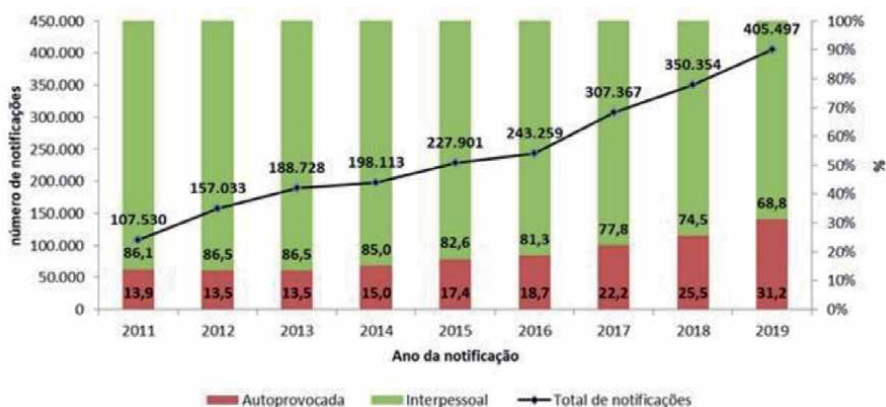


Figure 1.

Distribution of notifications of interpersonal and self-inflicted violence by year of notification. Brazil, 2011 to 2019. Number of notifications, year of notification, self-inflicted, interpersonal, Total notifications. Source: VIVA/SINAN, Ministry of Health.

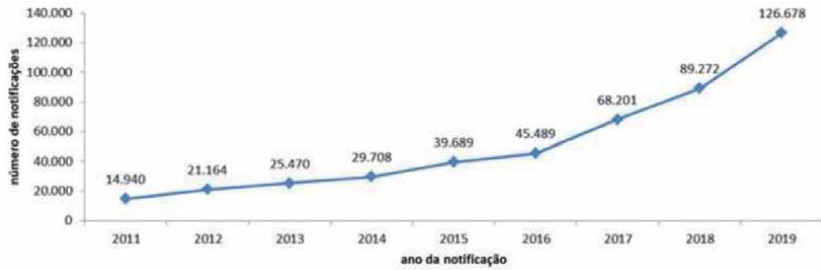


Figure 2. Distribution of notifications of self-inflicted violence by year of notification. Brazil, 2011 to 2019. Number of notifications, year of notification. Source: VIVA/SINAN, Ministry of Health.

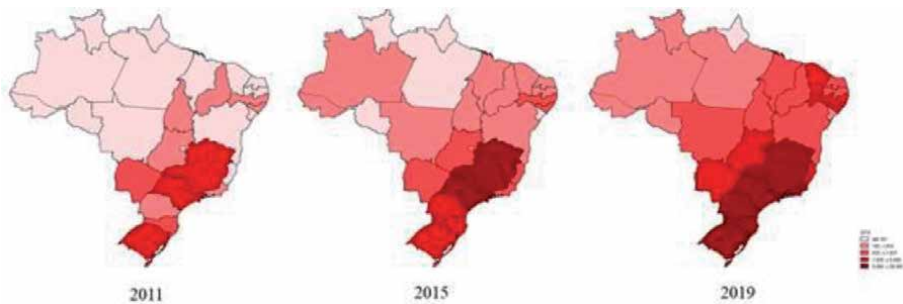


Figure 3. Distribution of notifications of self-inflicted violence by Federal Unit and year of notification. Brazil, 2011, 2015, and 2019. Source: VIVA/SINAN, Ministry of Health.

Throughout the period analyzed, self-inflicted violence involved mostly female individuals, corresponding to 64.9% of the cases reported in 2011 and 71.3% in 2019 (**Figure 4**).

Until 2015, about 50% of self-inflicted violence reported corresponded to individuals aged 20–39. From 2017 onwards, the most frequent age of cases involved adolescents aged 10–19, corresponding to 32.7% of notifications in 2019 (**Table 1**). Records of self-inflicted violence by older adults aged 60 or over showed an increase up to 2014, a year in which they accounted for 4.7% of the total. However, since then, a decline was observed, reaching 3.0% of notifications of self-inflicted violence in 2019 (**Table 1**).



Figure 4. Distribution of notifications of self-inflicted violence by gender and year of notification. Brazil, 2011 to 2019. Year of notification, male, female. Source: VIVA/SINAN, Ministry of Health.

	Year of notification								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Age (years)									
0–9	0.0	0.0	0.0	0.1	1.8	2.3	2.2	1.3	0.6
10–19	24.6	24.8	24.8	23.9	22.5	23.6	27.9	29.8	32.7
20–29	29.1	27.6	27.6	26.8	26.5	25.8	26.1	27.1	28.2
30–39	22.5	22.5	22.3	23.1	22.4	21.9	19.6	19.2	18.1
40–49	13.5	14.1	13.9	14.5	14.5	14.5	13.2	13.0	11.7
50–59	6.4	6.7	7.0	7.0	7.6	7.4	7.0	6.3	5.5
60 and over	3.8	4.4	4.3	4.7	4.6	4.3	4.0	3.3	3.0
Unknown	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.3
Ethnicity									
White	50.3	51.3	50.0	49.7	47.9	48.5	50.0	49.4	47.1
Black and brown	31.8	35.9	36.0	36.2	36.8	37.6	39.4	40.3	42.6
Yellow	0.8	0.8	0.6	0.7	0.6	0.6	0.7	0.7	0.7
Indigenous	0.3	0.4	0.8	0.7	0.7	0.6	0.6	0.6	0.6
Unknown/Missing	16.7	11.7	12.6	12.6	14.0	12.6	9.3	9.0	9.0

Source: VIVA/SINAN, Ministry of Health.

Table 1.
Distribution of self-inflicted violence reported by age group and ethnicity/skin color. Brazil, 2011 to 2019.

White people have the highest proportions of self-inflicted violence throughout the period, corresponding to 50.3% of the cases reported in 2011 and 47.1% in 2019. However, flaws are observed in the registration of events. The percentage of cases with data on ethnicity/skin color registered as “unknown” represents more than 10% in the period (**Table 1**).

The record of repeated self-inflicted violence by the same individuals increased throughout the period, ranging from 27.2% in 2011 to over 40% of cases in 2019. Also, suspected alcohol use was identified in about 10% of the reported cases. The home was the most frequent place of suicide attempts, reaching 84.5% in 2019; this event on public highways had a declining trend in its frequency in the period, ranging from 7.6% in 2011 to 3.9% in 2019. The most frequent means of self-harm was poisoning, followed by sharp objects and hanging, which concentrated, respectively, 66.3%, 18.1%, and 7.0% of the cases reported in 2019 (**Table 2**).

3.2 Suicides in Brazil

A total of 195,047 deaths by suicide were recorded in Brazil from 2000 to 2019. The increase in the number of deaths of suicide was observed in all Federation Units (**Figure 5**). The rate of suicide deaths shows a slow but persistent growth between 2000 and 2019, ranging from 3.9 to 6.4 per 100,000 inhabitants, equivalent to a variation of 64% or more. When observed by gender, the rates for men are higher than for women and higher than the overall rate for the country, reaching 10.2 deaths per 100,000 inhabitants in 2019 (**Figure 6**).

To better understand the characteristics of these deaths, an analysis was carried out for the beginning (2000), the middle (2010), and the end of the observation period (2019). In 2000, the country had a mortality rate of 3.9 deaths per 100,000 inhabitants. In 2010, it increased to 4.8 deaths per 100,000 inhabitants and 6.4

	Year of notification									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Happened other times	27.2	29.0	28.9	30.2	30.8	32.3	35.0	37.2	41.0	
Suspected alcohol use	18.8	19.3	19.5	18.2	17.3	17.1	15.2	13.5	12.4	
Place of occurrence										
Home/collective housing	76.9	78.8	78.7	81.1	80.9	80.7	82.2	84.1	84.5	
Public highway	7.6	7.8	7.4	6.4	6.1	6.1	5.3	4.0	3.9	
School/sports venue	1.0	1.0	1.0	0.9	0.9	0.9	1.1	1.2	1.4	
Others*	5.6	5.2	5.7	5.2	5.0	4.8	4.2	3.3	3.1	
Unknown/Missing	8.9	7.2	7.2	6.4	7.1	7.5	7.1	7.4	7.2	
Means										
Poisoning	39.7	41.6	41.0	43.2	45.6	50.1	52.6	59.1	66.3	
Hanging	6.6	7.0	7.1	8.0	7.1	6.8	6.8	6.9	7.0	
Sharp object	10.1	9.8	10.1	9.9	10.3	11.4	14.6	16.0	18.1	
Substance/Hot object	1.8	1.6	1.6	1.4	1.5	1.5	1.2	1.1	1.0	
Firearm	1.9	1.9	2.1	1.9	1.5	1.4	1.1	0.6	0.6	
Bodily force	13.9	13.1	13.5	13.1	10.0	8.8	7.0	1.8	1.7	
Blunt object	1.8	1.5	1.7	1.5	1.5	1.5	1.6	1.3	1.5	
Threat	3.2	2.9	2.9	3.2	3.0	2.2	1.9	0.3	0.1	

Source: VIVA/SINAN, Ministry of Health.
 *Other = Bars or similar; Trade/Services; Industries/construction; Others.

Table 2.
 Distribution of self-inflicted violence reported by event-related characteristics. Brazil, 2011 to 2019.

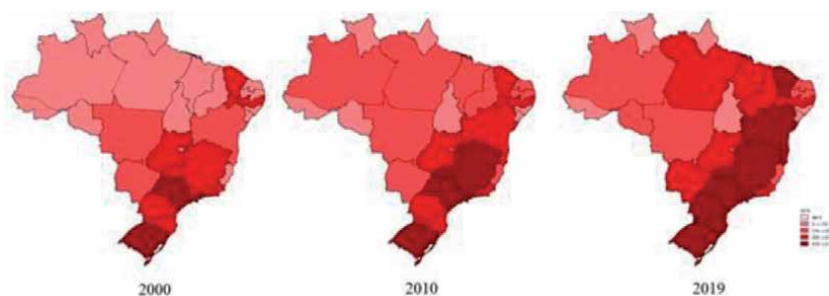


Figure 5.
 Distribution of completed suicide notifications by Federal Unit and year of notification. Brazil, 2011, 2015, and 2019. Source: SIM, Ministry of Health.

per 100,000 inhabitants in 2019. The highest frequency of deaths occurred among males at the beginning, middle, and end of the period. In 2019, the risk of suicide was 3.6 times higher among men than women.

The age group with the highest frequency of deaths from suicide in 2000, 2010 and 2019 was 20–29 years and concentrated 21% of all self-inflicted deaths in 2019. However, observing the rates by age, the rates among older adults aged 60 and over are expressive in 2000 and 2010 (7.0 and 7.3 deaths/100 thousand inhabitants, respectively), as well the rates among individuals aged 50–59 years in 2019 (reached 8.6 deaths/100 thousand inhabitants).

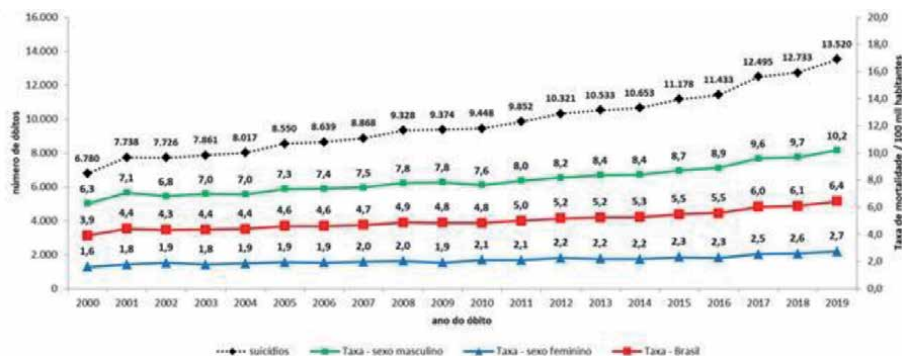


Figure 6.

Number of deaths and suicide mortality rate, by sex and year. Brazil, 2000–2019. Number of deaths, mortality rate/100 thousand inhabitants, year of death, suicides, rate – Male, rate – Female, rate – Brazil. Source: SIM, Ministry of Health.

	Year of death					
	2000		2010		2019	
	n	Rate	n	Rate	n	Rate
Gender						
Male	79.6	6.3	78.1	7.6	78.4	10.2
Female	20.4	1.6	21.9	2.1	21.6	2.7
Unknown	0.0	—	0.0	—	0.0	—
Age (years)						
0–9	0.0	0.0	0.0	0.0	0.0	0.0
10–19	9.0	1.7	7.5	2.1	9.0	3.7
20–29	23.8	5.2	23.4	6.3	21.0	8.4
30–39	21.5	5.6	21.1	6.6	20.4	8.0
40–49	18.4	6.3	19.5	7.3	17.8	8.3
50–59	12.3	6.6	13.1	6.7	14.8	8.6
60 and over	14.7	7.0	15.1	7.3	17.0	8.1
Unknown	0.3	—	0.3	—	0.1	—
Ethnicity						
White	59.5	—	51.3	—	48.8	—
Black and brown	30.8	—	42.8	—	48.7	—
Yellow	0.6	—	0.4	—	0.2	—
Indigenous	0.7	—	1.0	—	1.0	—
Unknown/white	8.3	—	4.6	—	1.3	—
Place of occurrence						
Home	54.3	—	56.8	—	63.0	—
Hospital/other health establishments	23.0	—	21.4	—	14.7	—
Public highway	6.4	—	6.8	—	5.9	—
Others	14.2	—	14.3	—	16.1	—
Unknown	2.0	—	0.7	—	0.3	—

Source: SIM, Ministry of Health.

Table 3.

Proportion and mortality rate from suicide by gender, age group, ethnicity/skin color, and place of occurrence. Brazil, 2000, 2010, and 2019.

Regarding ethnicity/skin color, more than 50% of deaths in 2000 and 2010 involved white individuals. However, in 2019, this frequency drops to 48.8% and is similar to the group of blacks and browns (48.7%). Moreover, the preferred place for committing suicide in Brazil has historically been the home (**Table 3**).

4. Discussion

The results presented in this chapter show the magnitude of suicidal behavior in Brazil, which is known to have abuse and homicide among the most frequent types of violence. However, the sharp increase in attempted rates and the progressive increase in completed suicides raise a warning for the national situation. The data are somewhat similar to other countries, such as the male primacy of accomplished acts and the prevalence of attempts among women [1, 3]. Also, the underreporting of suicides and suicide attempts is recognized globally, mainly because of religious taboos and family conveniences underpinning its dynamics. Data from VIVA/SINAN show that notifications tend to increase year by year, which may help in an increasingly reliable analysis of this phenomenon in the country.

Aiming at preventing fatal acts, specialists point out that, both regarding attempted suicides and completed suicides, we should pay attention to (1) the complex nature of the phenomenon encompassing social, micro-social, psychological, medical, and environmental factors; (2) the predisposing factors such as severe and degenerative diseases, physical dependence, mental disorders and suffering, severe depression, violence, and social isolation; and (3) the differentiation of risk factors by gender and age. Given the abovementioned factors, we should reflect on some specificities related to the life cycle, mainly because they provide clues for the health sector's design of prevention and care strategies.

In childhood, suicidal behavior is rare in most societies. The World Health Organization reports worldwide death rates of 1.7 per 100,000 people for boys aged 5–14 years and 2 per 100,000 for girls in 2000 [1]. While the occurrences are few, the social dimension underlying the reasons that lead people in the formative stage and at such a young age to seek death is impactful. The importance of some associated factors is highlighted: conflicts between father and mother or between partners, deaths, separations, violent family environment in which there is a lack of communication and expression of feelings, social isolation, living with mental problems, living in a domestic space with alcohol and drug abuse, receiving corporal punishment and humiliation at home and school – even if it is to educate. In general, living in a communicative, affective family and community environment, respecting rights and feelings, loving and responsible reference adults protect children [2, 9].

In adolescence, suicide and attempts grow significantly against the childhood period, especially after 15. The main risk factors for both attempts and self-inflicted death are: suffering physical violence, sexual abuse, and threats from peers or others; depression; having gender identity problems; experiencing unrequited love; being in social isolation; having problems with school performance and communication with teachers and peers; suffering emotional, family, social and cultural frustration; having contact with cases of relatives, neighbors, and colleagues who killed themselves [2, 10–12]. In general, in the attempts, medication intake is the most used means to self-harm, and the age for the most significant risk is 14.

Twenty-two suicides per day occur in the country among adults. The proportion of men (79.79%) is much higher than women, and the young adult age group is the most vulnerable. The most important risk factors for women are marital and sexual violence, rape, unwanted pregnancy, depression, and mental disorders [2, 13, 14]. Men's predisposing factors are associated with the world of work, alcoholism,

loneliness, isolation, and mental problems [2, 15]. Regarding labor activity, cases of poisoning by pesticides among farmers [16] and medication among physicians and medical students are known [2, 17], caused by firearm among police officers [2, 18, 19] and by several means among bank employees [2, 20].

In old age, almost five deaths per day were found in 2018. A significant under-reporting of suicide is observed in this period of life, as when the number of attempts is lower than that of completed suicide in that same year. According to national and international studies, there is at least a ratio of four attempts for each suicide committed in this stage of life [21]. As associated factors, the authors cite, in general, severe depression, social isolation, loss of meaning in life, loss of children and spouses, severe and degenerative diseases, economic and affection deprivation, inactivity, and experiences of violence in the past and current life [2, 22–24].

Suicide prevention strategies and suicidal behavior are very recent in Brazil. These were not considered a relevant problem for the Ministry of Health, although local groups, particularly in mental health, have been active regarding this issue that requires a multidisciplinary approach [25]. In 2005, the Ministry of Health began a series of actions to reduce the number of deaths, attempts, and associated harm, driven by the WHO guidance, which has committed to reducing the number of suicides in the world since 1990.

The National Strategy for the Prevention of Suicide (ENPS) stands out among the Brazilian initiatives. It was established by Ordinance N° 1.876, of August 14, 2006, and its guidelines follow the recommendations of the WHO Multisite Intervention Study on Suicidal Behaviors (SUPRE-MISS) directed to health professionals. Some of the outstanding recommendations for caring for people at risk of suicide are: (1) establishing a relationship of trust and listening cordially to individuals in a self-destruction crisis; (2) treating individuals with respect and empathy and keeping their manifestations confidential; (3) having a compassionate attitude to recognize signs of hopelessness and past attempts; (4) identifying that people with a family history of suicide, previous attempts, psychiatric disorder, depression, alcoholism are at risk; (5) talking openly to individuals who express a desire to kill themselves, believing what they express; and (6) becoming technically capable of distinguishing between low, medium, and high-risk levels.

WHO emphasizes one should not ignore the situation and signs of suicide attempts, be in a state of shock or panic at hearing these manifestations, put in mitigations, say that everything will be fine and that the problem will resolve itself, challenge individuals to go ahead, give false assurances, swear to secrecy, and leave high-risk individuals alone.

The document on the National Strategy for the Prevention of Suicide (ENPS), which can be found at <http://www.portaldasaude.pt/NR/rdonlyres/BCA196AB-74F4-472B-B21E>, recommends: (1) increasing information and social awareness about the problem; (2) training health professionals to provide comprehensive care in PHC units and Psychosocial Care Centers, in Urgent and Emergency Care Services, and in General Hospitals; (3) expanding access of the population at most significant risk to SUS health services; (4) encouraging studies and research on the subject; (5) improving reporting on mortality and attempts; (6) fostering and supporting local primary and secondary prevention programs; and (7) reducing access to lethal means.

The Ministry of Health also encourages and supports civil society initiatives that carry out actions to protect and prevent suicide, such as those developed by the Center for the Valorization of Life (CVV) has been operating since 1962, offering care to people who are suffering and try to kill themselves through the telephone number 141 and the website: www.cvv.org.br. Given the delicacy of the problem and the taboos that surround it, the safety network for people at risk for suicide should constantly be in the process of formation and action. National and international

surveys show that at least two-thirds of people who attempted or committed suicide had communicated their intention to take their own life in some way to friends, family, acquaintances, or healthcare professionals.

Brazil has several guidance materials for the most distinguished professionals to work in suicide prevention. Besides the two mentioned above, we mention a few that follow the WHO guidelines: (1) the National Plan for the Prevention of Suicide by the Ministry of Health; (2) a manual for Mental Health professionals; (3) a manual for teachers and educators; (4) a manual for general practitioners; (5) a media orientation manual; (6) a manual for the prevention of suicide in older adults. However, concrete prevention initiatives that usually mobilize all social forces and public authorities are only available in the country's southern region, where self-inflicted deaths are dire. In other locations, suicide prevention is still in its infancy and does not sensitize social conscience.

5. Final considerations

The situation presented here shows that it is impossible to underestimate suicide, a severe public health issue, which is violence that kills the most globally. However, it is noteworthy that both the studies and the prevention actions focusing on this problem are very preliminary, unspecific, and not focused on practical action. Future studies should care on situational analyses of locations where the risk is higher and discuss preventive and intersectional care strategies between health, social assistance, family support, and public safety services.

It is important to emphasize that, even with the availability of various types of guidance, we observed in the evaluation of services that Brazilian health professionals are still very poorly prepared to act effectively in the prevention of suicidal behavior and thus avoid so many deaths and injuries. Therefore, it is crucial to invest in training agents and the proper organization of PHC, mental health, and specialized services.


Gaps must also be filled, as is the case with the deteriorating phenomenon by groups of age and gender (including the LGBTQ+ population) because suicide affects childhood and adolescents and decimates Indigenous youth. Unconventional sexual orientation is often a risk factor for self-harm and death. As Hannah Arendt [26] recalls, violence (which includes suicide) dramatizes social causes that are unbearable for those trying to kill themselves. However, it is essential to stick with the World Health Organization's call: "It is imperative to prevent suicide!" [3].

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Risk Suicide, Anxiety, and Coping Strategies

Francisco Manuel Morales Rodríguez

Abstract

In this paper, we sought to examine the levels of suicidal risk and anxiety, as well as the coping strategies used in a sample of 154 Spanish university students, most of them first-year students, during the situation of confinement and the pandemic. After approval by the Ethics Committee, instruments for the evaluation of these constructs were administered. An ex post facto design was used. A high level of suicide risk was not found in the sample. Statistically significant differences were found in the levels of suicidal risk and anxiety according to gender, with higher scores in both variables for women. Likewise, the coping strategies of self-criticism and social withdrawal show direct associations with the levels of suicidal risk. We conclude by pointing out the relevance of the data obtained for a more effective design of psychoeducational interventions to face these public health problems with the training of effective coping strategies.

Keywords: suicidal risk levels, anxiety, coping strategies, assessment, college students

1. Introduction

Suicidal behavior has been considered a public health problem. (e.g., see [1]).

As stated in a recent article, “Etymologically, suicide (sui: “oneself”; caedere: “to kill”) is the intentional act of causing one’s death.” ([1], p. 107).

One of the consolidated models is that of the interpersonal psychological theory of suicidal behavior [2] in which for a person to commit suicide, two elements must be present; the desire to die by suicide, having the ability to do so.

State-anxiety can be defined as an immediate and modifiable “emotional state” over time while trait-anxiety refers to a relatively more stable personality trait or tendency [3].

In the current pandemic situation, it is essential to examine the levels of anxiety and suicidal risk in university students. Especially because, as some studies have shown [4, 5], this is one of the populations that may suffer greater stress in its various manifestations due to the academic situation they have to face, the uncertainty and insecurity about the future, etc., which may increase with the educational, social and economic impact of the pandemic situation.

In a previous study [6] the level of suicidal risk was assessed by applying the same scale that has been administered in this study to a sample of 93 university nursing students, finding that depression and emotional care are significant predictors of suicidal ideation, while self-esteem and emotional intelligence

(emotional repair and clarity) are the protective factors. Previous research has also found higher scores on levels of anxiety [7] and suicidal risk [8] in women compared to men.

More recently, during the pandemic, some recent studies [9] show higher levels of stress and anxiety in women compared to men. In the same vein, other studies in different contexts found higher levels of self-perceived stress in women compared to men [10, 11].

Thus, we sought to evaluate the levels of suicidal risk and anxiety, as well as the relationships between them, and the corresponding coping strategies used.

2. Methods

2.1 Participants

The participants were 154 university students who completed the instruments to assess these constructs. For this purpose, part-time students who did not complete all the questionnaires and students from courses other than the majority were excluded. The sample was gender-balanced.

2.2 Instruments

Plutchik's Suicide Risk Scale, Plutchick (1991) [12].

It is a scale made up of 15 dichotomous items with a Yes/No response format, which evaluates the level of risk or suicidal tendency. It has adequate psychometric properties of reliability and validity. The internal consistency of the instrument was of 0.89. An example of an instrument item is: "Do you see your future in any hope?" The cut-off point in which a person being at worrying levels of suicidality is set at 6.

State-Trait Anxiety Inventory, STAI, Spielberger (1994) [13, 14]. This instrument enables the evaluation of state and trait anxiety. It consists of 40 items with Likert-type response format with 0 = Almost never and 3 = Almost always. An example of an item of this inventory is: "I feel like crying". It is a widely used instrument that has adequate psychometric properties. State anxiety presented an internal consistency of 0.93 and trait anxiety presented an internal consistency of 0.89. There are no cut points. The higher the direct score, the higher the level of anxiety.

Inventory of Coping Strategies, Tobin (1989), adapted by Cano [15]. This instrument allows the assessment of coping strategies for coping with everyday stress such as problem-solving, self-criticism, emotional expression, desiderative thinking, cognitive restructuring, social support, problem avoidance, and social withdrawal. It consists of 40 items with response format: 0: not at all; 1: a little; 2: quite; 3: a lot; 4: totally. The higher the score in an item, the higher the score in that coping strategy. This instrument has also been administered in numerous studies and shows adequate psychometric properties. Coping strategies show Cronbach's alpha ranging from 0.75 to 0.88.

2.3 Procedure

This study obtained a favorable report from the Ethics Committee in Human Sciences of the University of Granada. In this sense, anonymity, confidentiality of the data, informed consent, protection of personal data, global treatment of data without comparing between groups or persons, among other aspects, were guaranteed.

2.4 Data design and analysis

A quantitative-transversal design was used. Descriptive and bivariate analyses on the relationships of the study variables were carried out using Pearson's Correlation Coefficient.

3. Results

For the suicidal risk variable, we did not find evidence of a high level of suicide risk in this sample (*mean* = 11.02, *standard deviation* = 5.08). However, the score is higher than evaluations of previous studies in non-pandemic and confinement situations.

For state and trait anxiety, the means and standard deviations were a mean of -9.82 for state anxiety (standard deviation = 10.25) and 3.41 for trait anxiety (standard deviation = 1.97).

In regards to the gender variable, statistically significant differences were found according to gender in the levels of suicidal risk ($t = -2.31, p < 0.05$), and state anxiety according to gender ($t = -1.96, p < 0.05$). The mean score in the level of suicidal risk and anxiety was higher in women (mean suicidal risk = 4.34; mean state anxiety = 24.66) compared to men (mean suicidal risk = 2.86; mean state anxiety = 16.17).

Regarding the relationship between the variables of the study, it can be highlighted that statistically significant positive correlations were found between the levels of suicidal risk and state anxiety ($r = 0.34, p < 0.01$) and the level of trait anxiety ($r = 0.45, p < 0.01$).

Regarding the evaluation of coping strategies of daily stress and their relationship with the level of suicidal risk, the coping strategies of daily stress and self-criticism show direct associations with the levels of suicidal risk ($r = 0.31, p < 0.01$). Likewise, the daily stress coping strategies of desiderative thinking and social withdrawal show statistically significant positive correlations with the variable level of suicidal risk ($r = 0.21, p < 0.05$; $r = 0.21, p < 0.05$, respectively). The social support strategy shows an inverse relationship with the level of self-perceived suicidal risk ($r = -0.47, p < 0.01$).

4. Discussion and conclusions

In this study, we evaluated the levels of suicidal risk and anxiety, as well as the coping strategies used in a sample of university students.

The results show the existence of statistically significant differences in the level of suicidal risk and state anxiety according to gender. In both cases, women have a higher mean score compared to men. This result can be considered congruent with previous studies that found higher levels of anxiety and suicidal risk in women compared to men [7, 8].

In previous research carried out by [6], lower levels of self-perceived suicidal risk were found in the sample of university students compared to our study. Hence, the pandemic situation and the confinement decreed in Spain may have possibly influenced these levels. We found higher levels of depression mood disorder in women compared to men. Depression was one of the significant predictor variables of suicidal ideation.

Regarding the relationships of the suicidal risk with the other variables in this study, positive correlations were found between the levels of self-perceived suicidal

risk and the levels of state anxiety, trait anxiety, and some of the coping strategies for coping with daily stress. Although more studies investigating university students are still needed, previous research [6] highlights the importance of coping strategies, such as those focused on social support and socio-emotional skills as evidenced in this paper.

However, this study has some limitations, for example, in our investigations, we employed self-reported measures which may have limitations of honesty, introspective ability, interpretation of questions, and response bias. In the future, more robust designs that integrate other variables are needed to establish more robust models with greater predictive capacity. It is also necessary to continue delving into possible cultural differences and their influence on the levels of risk and suicidal ideation, especially in some contexts where this topic is still taboo. Many studies that are very useful for the prevention of suicidal behavior in schools have been conducted, such as that of [16]. It would also be very interesting to analyze these variables from models based on artificial intelligence (e.g., [17]). It would be necessary to use a longitudinal design to evaluate the scores on these constructs.

5. Conclusions


The daily stress coping strategies of self-criticism, desiderative thinking, and social withdrawal demonstrate positive correlations with levels of suicidal risk. The self-perceived social support strategy also showed inverse correlations with the level of suicidal risk. Likewise, statistically significant differences were found according to gender, with higher levels of suicidal risk and anxiety found in women compared to men. The data obtained in this study are considered fundamental for the prevention of anxiety and suicidal risk levels in the current pandemic situation and the design of psychoeducational interventions for the training of productive coping strategies and socio-emotional skills.

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The Fallacy of Happiness: A Psychological Investigation of Suicide among Successful People

Nishi Misra and Shobhna Srivastava

Abstract

There are three feelings that prompt a person to take their life: hopelessness, helplessness and worthlessness. Studies have found that the risk of suicide increases with decreasing happiness. In the recent past, people have been left clueless when celebrities and successful people ended their lives despite appearing overtly happy. What prompted them to do so? Modern society today highlights the importance of success over failure. Although we are motivated to be successful in life, it should not become our main gauge of happiness. In the same way we should not let success be our main goal in life and get discouraged by failure. Happiness has been viewed in two ways: as concerning the well-being of a person, and as the opposite of depression. Each one of us has different ways of measuring happiness. The quality of one's happiness depends on one's priorities in life. Happiness is not merely something that can be quantified with how much success and failure one has because such metric is very much subjective. How do we prevent a young life from extinguishing? How do we identify suicidal behavior among successful people and help those around? The present chapter covers the possible reasons why successful people commit suicide. Role of media in preventing suicide and measures for preventing suicide by successful people has been discussed.

Keywords: Happiness, Successful, Suicidal Behavior, Depression, Suicide Prevention

1. Introduction

Is success synonymous with happiness? If that was so, why would the rich, talented, admired, and successful people, whom we regard as heroes, die by suicide? It is difficult for us to believe that such popular and successful people cannot have a happy life. The tragic death of Cafe Coffee Day founder VG Siddhartha who made us believe that “*A lot can happen over coffee*” and the deaths of Robin Williams, Chester Bennington, Anthony Bourdain and Kate Spade in the West are high-profile examples of the fact that success and happiness are not synonymous. There is a widely prevalent myth that “Successful people don't commit suicide”. The truth is not so. On the contrary, history is replete with examples of some of the most successful people committing suicide, both in Eastern and Western societies. Due to the stigma attached to depression, or seeking help during troubled times; such people often keep thoughts of suicide to themselves.

The year 2020 has seen a spike in suicide cases by celebrities/successful people in India in addition to COVID that has hit the headlines. High profile stars such as

Sushant Singh Rajput, character actor Asif Basra, actor Kushal Punjabi, Sushant's manager Disha Saliyan, television actor Samir Sharma, Indian TV actress Preksha Mehta and Sejal Sharma, TV actor Susheel Gowda and Tamil actress Chitra succumbed to suicide, leaving us wondering "what could have gone wrong in their lives that prompted them to take this extreme step"? These stars who seem to lead insular and isolated lives were not coping too well in a year marked by pandemic-induced lockdown and substantial loss of work due to the halt in film shootings.

Deaths of celebrities have also been there in the past like that of legendary actor Guru Dutt in the year 1964, film maker Manmohan Desai in 1994, model-turned actress Kuljeet Randhawa in 2006, film actress Jiah Khan in 2013, popular TV actress Partyusha Banerjee in 2016, and many more. A person may be extremely successful, rich and popular, and yet harbor demons like extreme anxiety and depression inside them. On the other hand, an ordinary man who is poor, may be a very happy person.

Showbiz is the field of glamor and people who are associated with this field are celebrities. While some succeed, others fail and those who are unable to cope up with the failure end their lives. Ten common factors that lead a person to undertake this act as pointed out by Shneidman are: I. The common purpose of suicide is to seek a solution. II. The common goal is cessation of consciousness. III. The common stimulus is intolerable psychological pain. IV. The common stressor is frustrated psychological needs. V. The common emotion is hopelessness-helplessness. VI. The common cognitive state is ambivalence. VII. The common perceptual state is constriction. VIII. The common action is egression. IX. The common interpersonal act in suicide is communication of intention. X. The common consistency in suicide is with lifelong coping patterns [1].

The NCRB report titled 'Accidental Deaths and Suicides in India 2019' [2], shows that of the total 1.39 lakh 2019 suicides, 93,061 were young adults (18–45 years). World statistics show that more men than women commit suicide while more women than men attempt suicide. However, the suicides in Indian film and television break this belief where more number of women, rather than men, commit suicide. This may be because women in the industry are expected to break the moral codes of how a woman should behave at work, in private life and in relationships. This leads to onset of gossip and social stigma that tends to attach to the families they come from.

1.1 The science of happiness

Happiness can be understood as a subjective, positive emotional state that people desire to sustain. Philosophic literature across cultures is replete with propositions, that happiness is the very purpose of human life. This dogma seems to have a universal acceptance; however, there have been diverse ideologies on how to attain it.

Is there a science behind this subjective and abstract feeling? Evolution biologists believe that mankind progressed beyond primitive survival needs as human brain evolved structurally. The growth of the orbitofrontal cortex, vastly helped the humans to experience and identify complex emotions. Sophisticated brain structures allowed humans to advance from nomadic existence to civilization, from hunting to agriculture and from concrete plans to abstract ideas. At the pinnacle of evolution, our brain has the capacity to create mirthful experiences that actually do not have concrete existence (not psychosis).

Early philosophers like Plato introduced the concept of hedonia (pleasure) and eudaimonia (happiness, welfare). Pleasure has been understood as a fleeting experience while happiness is an enduring feeling that can be cultivated and sustained. Happiness goes beyond the 'pleasure principle' of Sigmund Freud and the 'private events' of B.F Skinner. Contemporary Psychologist, Martin Seligman [3], in his

book “Authentic Happiness”, gave a formula for happiness. $H = S + C + V$, where (H) stands for happiness. It is the sum of three factors: one’s genetic set-range for happiness (S), their life circumstances (C), and factors under their voluntary control (V). The genetic set range refers to the fixed ‘average’ level of happiness around which our day-to-day happiness varies. The life circumstances are the external conditions (physiological, psychological needs). The third determinant (V) has received equal deliberation from scientists and religious buffs, because, voluntary control can be subjected to augmentation and strengthening. People can rewire their thinking mechanism and can create happiness for themselves, even during unfavorable circumstances.

Stephen Hawkins [4], when asked about his motor neuron disease said “*I’m happier now than before I developed the condition. I am lucky to be working in theoretical physics, one of the few areas in which disability is not a serious handicap.*” However bad life may seem,” he explained, “*there is always something you can do, and succeed at.*” There are numerous examples of people, who overcome hardships and created a fulfilling life for themselves, their definition of happiness rose from the limitations of their genetic makeup and their life circumstances. Mihaly Csikszentmihalyi [5], a proponent of Positive Psychology, called this the ‘*flow*’. It is a state where people souse themselves in the process of doing a task, which is challenging but closely matched to their ability. It is effortless and joyful. Happiness is created when sensory pleasures lead to something more meaningful and lasting. Altruism and Gratitude have been closely linked to this feeling of sustained happiness. Seligman in a research found that people experienced improved affective states from activities of kindness and gratitude. So Seligman’s (V) is real, it does not stem out of detachment or aloofness, rather from honing on one’s strength and engaging in mindful and meaningful activities like helping others, living a life of gratitude and engaging in kindness.

Now the question arises that is it possible for us mere mortals to relish this constant state of happiness. No cultural ideology claims to be an expert on all realms of human existence, but they have all mentioned something about how to attain bliss. They all believe that as humans all of us have selfish carnal instincts, that need to be acknowledged and worked upon, like Maslow’s hierarchy of needs they need to be addressed before moving on to higher goals of self actualization. Once the fundamental needs have been realized, the focus should shift from deficit to sufficiency, where we can find and work on our strengths and utilize them for a larger good. Happiness is created when one learns to appreciate the gift of health, if he has been given one. Engaging in physical exercises is a way of expressing gratitude towards the brilliant machine, that all of us have; our body. Humans were not created to exist in a social vacuum, we find happiness when we create meaningful and lasting relationship, when we mindfully engage in transitions that are devoid of selfishness and we draw on each other’s strengths. Experiencing Gratitude has unanimously emerged as one of the powerful tools to attain bliss. Researches [6] have shown that one can attain happiness not only by being thankful for they currently have but also for what they envision for themselves. In order to create a happy world, the change has to happen at an individual level, where we strive to become a better version of ourselves. Happiness is not a destination that one has to reach; it is a journey that has to be embarked upon, with a vision that new learning and discoveries will be made every day. There would be frustrations and failures, but the journey would continue.

1.2 Happiness suicide paradox

There is a connection between suicide and happiness which is still not resolved. Suicide has been regarded as an act of extreme unhappiness. It has been seen that

generally people who commit suicide are very unhappy. A look at the world happiness report shows the presence of a happiness paradox with happier countries being more suicidal. It has been found that some countries that have high rankings in terms of happiness have the highest suicide rates. The World Happiness Report [7] has shown Finland and Denmark as the happiest countries. There seems to be quite a strong correlation between the score given in the World Happiness Report and suicide rates, with the “happiest” countries, on average, having a suicide rate of over twice as much as the least happy countries. Many “unhappy” countries have a low number of suicides and many “happy” countries have a high number [8]. Finland, a country that has been ranked as the “Happiest Country” for two years in a row, has a suicide rate of 15.9. In the 2016 Report Peru was ranked 63rd happiest nation but had a suicide rate of 4.9, Austria had a suicide rate of 15.6 and the United States a rate of 15.3. On the contrary, Syria, a country that had been in civil war for five years, had a low suicide rate of 1.9.

Thus, the presence of a high happiness score and a high suicide rate is not necessarily contradictory. One may reason as to how can these countries be so much “happier” (and richer) and yet have significantly higher rates of suicide? Some economists [9, 10] believe that self-reported life satisfaction, which is regarded as ‘happiness’ refers to the success of a society. They refute the existence of a paradox and say that the same factors that promote happiness, like high income, marriage, good health – also inhibit suicide.

Daly, Oswald, Wilson, Wu, 2011 [11] believe that the decision to commit suicide is influenced by relative comparisons. It may be said in different words that “people may find it particularly painful to be unhappy in a happy place”. Experiencing depression when one is healthy and experiencing depression when one is poor can be two different experiences.

People of poorer, less happy countries might not be committing suicide because they have hope for a better, richer future. On the contrary, people residing in wealthy countries feel depressed. People who are born in a poor country say that any problem that one has would be solved if one had more money or better opportunities. If one is from a wealthy country and feels that he is a failure, if he feels that there is no place in this world that is right for him, what options does he have? The solutions are not nearly as simple.

What about the other factors that affect suicide and life satisfaction? Some match up, but more do not. Women have slightly higher life satisfaction than men, but much lower suicide rates. Blacks have slightly lower life evaluation than whites, but much lower suicide rates. Married people are more satisfied and are less likely to kill themselves, but while divorce strongly predicts suicide, it has a relatively modest effect on life satisfaction. Widowhood raises suicide among men but reduces it among women. Taking these and other factors (such as education) together, there are indeed matches but also many contradictions. Except for these long-term trends, in reality, life satisfaction and suicide do not have much to do with one another. Empirical connections [12] between suicide and happiness have been examined by looking at the connection of each with seven standard demographic characteristics. They are sex, age, race, parental status, marital status, religiosity and employment status. Findings indicate that marital status, religiosity and employment status have a (predicted) similar effect on suicide and happiness. Parenthood has an unclear relationship with suicide and happiness. Finally, sex, age and race have dissimilar effects on suicide and happiness. On the basis of this preliminary analysis, it would be impossible to conclude that happiness and suicide are closely (if inversely) related. First, there is the chance that suicides or happiness levels have been systematically misreported. Second, there may be a problem with mixing together happiness and satisfaction. Third, there may be a problem with the

independent variables chosen. In case different independent variables were chosen, the results would have been different.

More than 40 years ago, three psychologists published a study titled, “Lottery Winners and Accident Victims: Is Happiness Relative?” [13]. The authors surveyed lottery winners and accident victims, plus a control group, in order to compare their levels of happiness. It was found that the victims, while less happy than the controls, still rated themselves above average in happiness, even though their accidents had recently rendered them all either paraplegic or quadriplegic. And the lottery winners were no happier than the controls. Talking to friends, hearing jokes, having breakfast — all of these simple pleasures now left them less satisfied than before. The takeaway being, “Money doesn’t buy you happiness”. Generally, suicide is not significantly related to life satisfaction; or negative affect, or positive social emotion, but significantly negatively related to positive self-emotion, or positive interpersonal emotion.

“There are three feelings that prompt a person to gradually want to take their life - hopelessness, helplessness and worthlessness.” Worthlessness makes a person feel like they are good for nothing, helplessness makes them believe that there is nothing or no one out there who can help them, and hopelessness makes them feel like they have nothing to look forward to.

Most successful people overtly appear to be very happy as they have everything: a great job, happy family, good social life, a beautiful home. From the outside veneer we say that they are doing a great job and their life is wonderful. But we really are unaware about their covert world. The concept, “Pennface” is applicable on them which means “Look cool, calm, fit and smart on the outside while struggling like hell on the inside.” The term “smiling depression” – appearing happy to others while internally suffering depressive symptoms – also applies on them.

2. Why do successful people commit suicide?

Suicide reflects our limitations as a society towards maintaining mental health and well-being. The psychological process underlying any suicide is complex and there is no single event that can be labeled as its cause. A person with no clinical mental health issues could be suicidal and a depressed or mentally stressed person may not be so. The emotional pain that is experienced is common to all cases. Many of these individuals suppress emotional pain or stress, instead of facing it or accepting it. They use the avoidance strategy or may use such coping methods as drug abuse, alcohol abuse, self-harm, binge eating/starving and the like. They consider the step of ending their lives as the last resort.

No single factor can be attributed to suicidal behavior. A combination of physical and mental health issues, relationship problems, job stress, financial stress, legal hassles and domestic problems — especially if combined with substance use — can increase a person’s risk for suicide. It has been found that more than half of successful people who died by suicide did not have a known, diagnosed mental health condition at the time of death. However, some common factors that may be considered responsible for a successful person taking this extreme step are:

2.1 Pressure to be perfect/perfectionism

Perfectionism, or the tendency to hold oneself to consistently impossible standards and/or feeling the need to meet or surpass the lofty expectations of others, may be attributed as one of the significant factor responsible for suicides among successful people.

According to Smith, 2017 [14] perfectionism is associated with “intense psychological pain”. Perfectionists have a “harsh way of relating to a self they find deficient”. Their lives are typically stressful and they often have a “prickly, conflictual style of relating to others,” leaving them isolated and lacking support. Such people feel that whatever they do, it can be done better. They are unable to tolerate poor results as they are used to success. Since successful people are always in the public eye; they are constantly under pressure to perform and stay relevant. Sidney Blatt (1995) [15] highlighted the apparent link between perfectionism and suicide in an influential article for *American Psychologist* titled “The Destructiveness of Perfectionism” in which he profiled three highly talented, ambitious but harshly self-critical individuals all of whom took their own lives: Vincent Foster, a deputy counsel to President Bill Clinton; writer, singer and broadcaster Alasdair Clayre; and athlete and scholar Roger D Hansen.

In order to maintain a personal and public image of strength and perfection, such people are constantly trying to prove themselves. They feel vulnerable to any possible implication of failure, and are unable to share their anguish with others. The most pernicious form of perfectionism leading to suicidal thoughts is feeling the weight of meeting other people’s expectations. More research studies with diverse groups are however needed to establish the link between perfectionism and suicide.

2.2 Isolation, superficial relationships

Existential isolation and loneliness both independently predict depression and suicide ideation, as well as interact to predict greater depression, such that those who are both existentially isolated and lonely report the greatest depression [16]. “Suicide is a crime of loneliness, and adulated people can be frighteningly alone. Intelligence does not help in these circumstances; brilliance is almost always profoundly isolating” [17].

The busy work schedule and commitments at workplace of successful people make it difficult for them to maintain friendships, marriages, relationships. It is all superficial because of which they have no close friend whom they can trust. They find themselves alone and isolated on an island of recognition. Rockwell & Giles [18] investigated the experience of being famous through a series of in-depth interviews of famous celebrities in various societal categories: government, law, business, publishing, sports, music, film, television news and entertainment. The study found that in relation to self, being famous leads to loss of privacy, entitization, demanding expectations, gratification of ego needs, and symbolic immortality. According to Reichmann [19], the emotional isolation is a screaming, desperate need to connect, to be understood, even when surrounded by people. Every human being has a need for social connection. The reluctance to seek help of a mental health professional when needed is rampant in the highly educated and successful people.

2.3 Inability to handle failure

Successful people set high standards or benchmarks that push them further and further into a sense of inadequacy at some level. Not only have failures happened at work but in personal life too. They are unable to accept rejection and do not have the practice to wait for some time to recover. The suicide of 17-year-old wrestler Ritika Phogat from India shook the nation. She took the drastic decision after her inability to take her loss in the finals of a tournament. Achieving success makes them put themselves through needless pressure or contemplate suicide when they are unable

to do so. Rihmer & Benazzi [20] reported that personality traits like emotional instability, impulsivity, fragility and identity disturbance plus a fragile state of mind make one crumble under pressure. While growing up, such individuals are constantly pushed to excel. They are initially compared with their siblings, fellow mates and sometimes even their relatives from other generations' on a regular basis. This makes them want to try to always win. Given their best, on encountering failure they feel that they have nothing more left to give, they may feel hopeless about their future life, doubt their capacity to overcome adversities and feel that taking their own life is the only way out.

2.4 Feelings of insecurity

Insecurities are related to the standards set by the people we interact with, such as our family, friends, peers and society. They occur when we feel that we do not measure up to where we "should" be. This may lead to low self-esteem, experience of body image issues, feeling of lack of direction in life, or feeling overlooked by others. Some of these celebrities may have a childhood where parents have been too pushing in order to fulfill their desire for success. In adulthood, significant others drive them to excel, which may not match the desires/goals of the individual. Such individuals do not appear insecure overtly but may fear abandonment and doubt their own ability to form lasting relationships with others [21]. According to Judi Cinéas, these people lose their right to everyday human emotions. The high performers are under great pressure to continue to excel. The higher they are, the greater the pressure to keep excelling. They are under continuous threat to be above others who are lined up with them. Facing this tough competition is a source of stress for them which affects their mental health to a great extent.

2.5 Domestic issues/compatibility issues/lack of trust

Poor marital relationships and other forms of failed companionship, broken homes, financial losses and domestic abuse are likely to increase the emotional pain leading to suicides. "Recent data from NCRB reflects the anomie our society is facing in dealing with this most sensitive part of human lives. Difficulty coping with failed relationships like break up, divorce and the like is forcing people to take this as the last step [22]. Among the several reasons pointed out by experts, lack of communication, lack of empathy, impulsivity and even technology are to be blamed. "Certain personality traits along with the upbringing styles that make people prone to develop low frustration tolerance, impulsivity, conformity/comparison– are the major reasons that relationship issues are getting difficult to handle for people today" [23]. Lack or loss of trust is one of the most harmful contagions to a couple's long-term success [24]. Trust issues may include factors such as jealousy, possessiveness, unreasonable rigidity, emotional infidelity, physical/sexual infidelity, relational game playing, lack of reliability and dependability and lack of emotional support [25].

2.6 Slump during COVID pandemic

During the pandemic job losses have sky rocketed and people have been confined to their homes leading to isolation and heightened feeling of isolation. The sustained economic stress caused by the slump has resulted in job losses for many people resulting in suicidal thoughts. The prolonged financial and personal stress caused by the pandemic has increased the risk of suicide by creating a "perfect storm", especially for those who are suffering from depression and anxiety [26].

Celebrities (film actor and actress) have gone through enormous challenges during this pandemic due to loss of employment, cancelation of contracts, loss of public identity, life-style limitations, boredom, etc., which may attribute to stress and suicidal behavior. As per the media reports, several Indian celebrities committed suicide during this COVID-19 pandemic.

2.7 Psychopathology/mental illness

Jamison [27] says that the most common element in suicide is psychopathology or mental illness like mood disorders, schizophrenia, borderline and antisocial personality disorders, alcoholism and drug abuse. Coryell & Young [28] found that almost two thirds of suicide attempters and completers have (mostly untreated) major depressive episodes at the time of the suicidal act. People with, unipolar major depressive disorder (MDD) and bipolar disorder type I and type II (BPD-I, BPD-II) are highly vulnerable to suicidal behavior. Individuals with BPD are 30 times more likely to attempt suicide than those with no psychiatric disorder [29, 30]. Many individuals who are suffering from depression and manic depressive illness are able to manage their lives between episodes of their illness. The combination of symptoms like depressed mood, coupled with morbid thinking, disturbed sleep, heavy drinking are found leading to suicide. Mental health needs of celebrities are complex, often unaddressed due to different psychological concerns such as unwillingness to give up fame, mistrust, isolation, and character-splitting. These concerns could be the reason for the delay or lack of treatment-seeking behavior or supportive care despite being aware of the mental health problems. In addition, the published literature on the phenomenological analysis of fame among celebrities has reported that being famous leads to loss of privacy, expectations, symbolic immortality, and gratification of ego [18]. Depression is understood as a conglomeration of three negative schemas: negative view of self, negative view of world and negative view of others. Depression shatters the capacity. It reduces the flexibility of the mind to adapt making it more constricted and rigid because of which the individual resorts to alcohol and drug abuse. Stressful life events, early losses or trauma, medical problems, and even certain medications can trigger the onset of depression. Often it's a combination of these factors. No matter how successful one becomes, there are people who are doing better than you. This constant comparison to others can cause extreme feelings of failure even when one is super-successful. Always looking up the ladder is surely a self-destructive behavior. Such people become disconnected with the general population as their problems are not similar to the general population. Since work consumes their entire day, they begin defining themselves by their achievement at work and lose their self-identity. In case they encounter failure, they hold themselves responsible for it, discounting all their successes.

2.8 Inability to maintain work/life balance

The quest for success makes such people so busy that they ignore their life beyond work. There is a blurring between work and life which they are unable to balance adequately. This results in a heightened level of stress that spills over from work to personal life which they are unable to handle. A 24-year-old's death after working 105 overtime hours in one month caused Japan to rethink work-life balance. Accommodative coping strategies are generally helpful in dealing with personal failures, to achieve higher satisfaction at the end of the day [31]. *Successful people, who are not able to use humor to insulate their private lives from their work lives and strike a good work-life balance, fall prey to suicidal ideations.*

2.9 Social media tension

Use of social media platforms has increased drastically since the last few years. It has created virtual communities without physical borders [32]. Being at the forefront because of their achievements, successful people have their presence in social media which reflects their public image which they do not want to put under risk. They are trolled for any small thing they do. Any dent in that image creates a dent in their brand. In case the public image gets tarnished, it serves as a turning point in their lives for which they need to be strong enough.

3. Role of media in preventing suicide

In this age of infobesity or information explosion, we are presented with more information than our brains can process at a given time. It is overwhelming and can affect our judgment and decision making ability. This problem becomes more precarious, when incidents of suicide are reported in the media, with graphic details, that include pictures and videos of the crime scene, description of the method of suicide and content of the suicide note (Hawton & Williams) [33] (if any). All this adds to the grimness of the situation. In study by Pirkis and Blood [34], reporting and portrayal of suicidal behavior in the media may have potentially negative influences and facilitate suicidal acts by people exposed to such stimuli. *Werther effect* or copy cat suicide [35] has been used to describe the media induced emulation effects of suicidal behavior. On the contrary, *Papageno effect* or the influence that mass media can have by responsibly reporting on suicide and presenting non-suicide alternatives to any life crises is the need of the hour. The Papageno effect has been used by the media on various platforms for example; Live through this and Stories of hope and recovery, where suicide survivors share their experiences of finding a meaning in their life. In a study by Niederkrotenthaler et al. [36], it was concluded that the impact of suicide reporting may not be restricted to harmful effects; rather, coverage of positive coping in adverse circumstances, as covered in media items about suicidal ideation, may have protective effects. This leaves all the media platforms with a huge responsibility which can be fulfilled as under:

- a. Ethical and responsible reporting, which celebrates life rather than embellishing suicide. If the power of media is harnessed effectively, it can be used as a vital platform to promote and destigmatise mental health. Presenting simplistic explanations of suicide should be avoided. Suicide is never the result of a single factor or event. Thus the final precipitating event is not the only cause of suicide. Acknowledging the problems that could have played a causative role to be encouraged [27]. Alternative approaches for coverage of newsworthy suicide stories need to be discussed by media representatives. Glorifying of suicide is to be avoided to prevent the spread of suicide contagion.
- b. Utilization of Social media to identify people at risk of suicide, and provide them with help resources.
- c. Discussion on mental health issues that help the audience identify the symptoms of depression and anxiety can help in early recognition and prevention of any escalation [37].
- d. A warning to be accompanied along with the graphic and sensitive content on any media source. Unnecessary autopsy of any celebrity suicide should be completely avoided.

- e. Programs that promote hope and rejuvenation should occupy prime time and news feed. The kind of engagement that the world currently has with media platforms, it can be potent tool towards better mental health, if used judiciously.

4. Prevention of suicide by successful people

The deaths of successful people by suicide reveals that they have something in common, they were bright and ambitious people, who were aiming big in life. It has been concluded however that success does not equal happiness. It left many wondering that if rich and successful are not immune to suicide then, who is? There are some ways which, if followed, is likely to contain this phenomenon to a great extent. They are to be followed at different levels, individual, group as well as societal. They are as under:

- a. Like Physical health, mental health has to be de-stigmatized [38] (reciprocal relationship). The talk about mental health should be incorporated into parenting and child rearing. It should be a part of the academic curriculum, on boarding process etc. so that it becomes a norm and not regarded as something skewed.
- b. Responsible media coverage of suicide wherein filtered dissemination of content via social media is done. Individuals to be mobilized to discuss mental health and reduce stigma.
- c. Life skills such as conflict resolution, decision making and problem solving should be taught early on in life. They help in building resilience, which is a protective trait against suicide.
- d. Google can act as a “gatekeeper” for individuals who seek suicide-related information online (e.g., “how to kill oneself”). The search engine displays a “suicide-prevention result” (SPR) at the very top of some suicide-related search results. This SPR comes as an info box and contains supposedly helpful crisis help information such as references to a telephone counseling service.
- e. Other Medical fraternities, should be sensitized about Mental Health, people are comfortable visiting a dermatologist or a sports medicine expert, rather than a psychiatrist or a psychologist. These professionals can act as a gateway for garnering mental health support.
- f. People can be taught to identify when they need help and support. Self help tools can be used before professional help is incorporated. (cognitive therapy)
- g. Crisis helplines become handy in times of need as they also help in protecting identity.
- h. Garnering peer support, where people genuinely take interest in your well being adds a layer of protection in difficult times.
- i. The understating that success does not make one infallible and seeking help in times of crisis can go a long way in the prevention of suicide.

5. Conclusions

The very act of suicide by successful people suggests that success and happiness are not synonymous terms but point to the presence of a paradox. History is replete with examples of successful people committing suicide. Success, fame and recognition does not create an impermeable wall around people, which cannot be permeated by distress and disease. The stigma around mental health affects them as well. The reluctance to seek help of a mental health professional when needed, is rampant in the highly educated and successful coterie.

There is no single reason which prompts a person to commit suicide. There are a host of factors in addition to mental illnesses like depression, bipolar disorder, borderline personality disorder, drug abuse and the like, making one more susceptible to take this extreme step. For preventing suicides by successful people, ethical and responsible reporting of suicide by media is needed. Promoting programs that encourage hope and rejuvenation and mobilize individuals to discuss mental health, use of crisis helplines and the like can help in preventing such suicides to a remarkable extent.

Conflict of interest

No conflict of interest.

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Suicide Following Traumatic Brain Injury: Pathogenesis and Neurocognitive Mechanisms

Kenneth J.D. Allen

Abstract

Traumatic brain injury (TBI) is associated with varied neuropsychiatric sequelae, including elevated risk for later suicidal behaviors (SBs). This chapter provides a qualitative narrative review of hypothesized biological and neurocognitive mechanisms linking TBI to subsequent SBs. The following selective review specifically highlights: (1) Structural and functional alterations to neural circuitry secondary to common head injuries (e.g., concussions or mild TBI) as well as severe or repetitive TBI (e.g., chronic traumatic encephalopathy); (2) Overlap between post-TBI neuropsychological deficits and proposed bio-behavioral indicators of suicide risk; and (3) Potential neurocognitive mediators of the relationship between TBI and SBs, with a particular focus on executive functions involved in self-regulation (i.e., cognitive and affective inhibitory control) and their neural substrates, e.g., corticolimbic, frontostriatal, and frontoparietal circuitry. The chapter concludes with theoretical and practical implications of this shared pathophysiology, based on the reviewed empirical literature.

Keywords: affective control, chronic traumatic encephalopathy, concussion, executive functioning, mTBI, self-regulation, post-concussive syndrome

1. Introduction

1.1 Clinical description, diagnosis, and epidemiology

1.1.1 Head trauma

Head injuries comprise a broad spectrum of severity, ranging from isolated sub-concussive trauma to repetitive, severe traumatic brain injury (TBI). However, even acute mild TBI (mTBI; c.f., “concussion”) can produce lasting neuropsychological deficits and increase risk for progressive neuropsychiatric sequelae, including chronic traumatic encephalopathy (CTE), cognitive decline, neurological diseases (i.e., Parkinson’s disease and other dementias), prolonged post-concussive syndrome (diagnosed as “neurocognitive disorder due to traumatic brain injury”), and adverse mental health outcomes [1–5]. CTE – most often a consequence of repetitive mTBI – is especially tied to psychiatric illness [6], and is itself

characterized by dysregulated behavior and mood, beyond non-specific cognitive deficits associated with other forms of TBI, e.g., attentional difficulties, executive dysfunction, and memory impairment [7, 8]. Behavioral and mood symptoms of CTE, which frequently include suicidal ideation [6], implicate impaired *affective control*, or insufficient “top-down” cognitive (inhibitory) control from frontal cortical regions over “bottom-up” stimulus-driven impulses generated by sub-cortical areas, e.g., limbic circuitry [9–13]. Affective control impairment (and consequent behavioral/emotional dysregulation) is a hypothesized central feature of psychiatric conditions trans-diagnostically and proposed latent vulnerability factor for suicide [9, 11–15]. This selective narrative review will provide a focused summary of relevant literature on the association between TBI and psychopathology, highlighting prospective relations between non-penetrative head injuries and later suicidal behaviors (SBs).

Approximately half of the world’s population has sustained at least one TBI, with 27–50 million new cases occurring globally each year – although prevalence estimates vary considerably due to inconsistent definitions and diagnostic criteria [1, 4, 16, 17]. Severe TBI is associated with a staggering 30–40% mortality rate [18]; however, mTBI account for the vast majority of cases (up to 95%; [4]). Nonetheless, TBI is the leading cause of mortality among young adults and together, physical head trauma is among the top contributors to disease burden worldwide, costing the global economy approximately \$400 billion USD annually [4, 16].

TBI severity is commonly characterized using the Glasgow Coma Scale (GCS; [19]), which assesses visual, verbal, and motor responsiveness on a 3–15 point scale. Current consensus defines mTBI as a GCS score between 13 and 15 at least 30 minutes post-injury, concurrent with one of the following symptoms: (a) < 30 minutes of lost consciousness; (b) < 24 hours of post-traumatic amnesia (PTA); (c) impaired cognition at the time of the accident (e.g., confusion or disorientation); and/or (d) transient neurological consequences, e.g., epilepsy or focal signs [16]. GCS scores between 9 and 12 or lower than 9 indicate “moderate” and “severe” TBI, respectively [19], although there is less agreement regarding these definitions [4]. Regardless, the GCS is a crude (if efficient) assessment of TBI severity with debatable clinical utility [20, 21], given widespread brain damage that may accompany even “mild” closed head injuries [22]. Indeed, chronic cognitive, emotional, and behavioral issues following TBI frequently lead to long-term disability, independent of severity classification derived from GCS scores [22, 23]; for example, while loss-of-consciousness is sometimes considered a pathognomonic diagnostic “threshold” for TBI, this symptom (and other widely-used GCS indicators) are inadequately sensitive to the extent of acute neurological damage and are generally poor prognosticators of clinical outcomes longitudinally, e.g., see [24].

1.1.2 Suicidal thoughts and behaviors

Suicide is the *second* leading cause of death in young adults, accounting for more than 800,000 deaths globally each year – a mere fraction of the estimated 30 million nonfatal suicide attempts occurring annually [25, 26]. Of course, a much larger proportion of individuals endorse a history of suicidal thoughts, with lifetime prevalence estimates of 15–25% in unselected samples [27, 28]. SBs are defined as deliberate self-harm performed with at least some intent to die, reflecting a range of acts with varying levels of intentionality and lethality, e.g., from preparatory behaviors to death by suicide. SB definitions remain disputed even within a single category; for example, the classification of accidental drug overdoses in persons with suicidal thoughts but ambiguous intent remains controversial [29]. The diversity of

these behavioral manifestations contributes to the wide interval of SB prevalence estimates, which may be as high as 3–5% over the lifetime [27, 28].

Prior self-injurious thoughts and behaviors – particularly *non*suicidal self-injury (NSSI), or deliberate self-harm enacted *without* lethal intent – are among the strongest predictors of future SBs [30]. NSSI often involves cutting, burning, and/or self-battery, which are strikingly common behaviors in youth: internationally, approximately one in five adolescents report lifetime NSSI engagement in unselected samples [31]. Prominent suicide theories explain this counterintuitive prospective association as reflecting either (a) a contributory (causal) effect of NSSI on future SBs or (b) shared vulnerability that produces multi-final psychopathological outcomes (possibly depending on the presence of moderating factors; see [32] for a review). The latter position is consistent with the notion of a latent transdiagnostic risk factor implicated across neuropsychiatric syndromes, including aforementioned behavioral and/or emotional symptoms arising from affective control deficits, which commonly characterize non-suicidal/suicidal self-injury [9–11, 14, 33] and repetitive TBI/CTE [5–8].

1.2 Bridging the *g-a-p* from TBI to suicide

My colleagues and I recently advanced a novel conceptual framework for understanding relations among NSSI, suicide, and affective control: the *g-a-p* model [9], referring to the overlapping roles of (a) the theorized latent “*g* factor” representing general intellectual capacities (c.f. “cognitive reserve”; see [6] and Section 2.2.3 below) and (b) the correspondingly proposed “*p* factor” of underlying vulnerability to diverse manifestations of psychopathology. The *g-a-p* model is supported by multiple converging lines of empirical evidence. First, “cool” executive functions (EF) – particular cognitive control or inhibition – provide fundamental scaffolding for higher-order mental operations and ultimately, the *g* factor of intelligence [34, 35]. Second, cognitive control deficits and other aspects of executive dysfunction are present in most psychiatric disorders [36, 37], potentially further implicating EF in the latent *p* factor of psychopathology risk. The extant literature is consistent with this possibility, emphasizing transdiagnostic impairment in *affective* control, i.e., inhibitory processes necessary for regulating stimulus evaluation, motivated action, and emotional reactivity [9]. Affective control thus represents the “hot” EF analogue to cognitive control, relying on shared neural substrates, i.e., functional connectivity within frontoparietal (central executive), frontostriatal (positive affect), and corticolimbic (negative affect) circuitry. The *g-a-p* model proposes that affective control represents an “equi-multi-final common pathway” from numerous established risk factors (including TBI) to various psychiatric outcomes and suicide [9, 11, 14].

The empirical literature reviewed in this chapter aligns with the perspective that TBI is similarly characterized by (acquired) impairment in affective control, which comprises a set of candidate neurocognitive mechanisms that undergird prospective associations between head injury and psychopathological phenomena like suicide. The reviewed research specifically suggests that certain forms of TBI may promote neurodegenerative processes that enhance psychopathology risk through acquired deficits in cognitive and/or affective control. Given the chronic course of many TBI cases, this vulnerability might not manifest for some time following the initial injury, obscuring the causal effects of TBI-related neurodegeneration on subsequent psychiatric dysfunction. The central thesis of this chapter accordingly posits that TBI elevates suicide risk via acquired deficits in cognitive – and more specifically, *affective* – inhibitory control.

2. Empirical literature review

2.1 Overlapping neurobiology of TBI and suicide

2.1.1 TBI pathophysiology

The pathogenesis of TBI is dynamic and progressive, involving (a) primary focal lesions due to the index head trauma, both at the impact site as well as its polar opposite location on the skull (i.e., “coup-contrecoup” injury), which in turn promote (b) secondary brain damage arising from localized and systemic dysfunction, manifesting as diminished functional brain connectivity that may worsen over time [38]. In brief, head trauma initiates a “metabolic cascade” via allostatic and epigenetic mechanisms, which produces persistent – if microscopic – brain damage [39]: acute neurological symptoms following TBI may be partially attributable to ionic flux (i.e., trauma-induced alterations in the permeability of lipid membranes that disrupts the flow of calcium, potassium, and sodium ions between neurons and the extracellular matrix), resulting in distributed glutamatergic hyperactivity, generation of free radicals, and increased energy demand in the context of reduced cerebral blood flow. Furthermore, biomechanical force from the impact *directly* damages the delicate cytoskeletal structure of glial cells and neurons (especially unmyelinated axonal projections), facilitating dysconnectivity and a chronic imbalance between excitatory (glutamate) and inhibitory (GABA) neurotransmission. Long-term glutamatergic hyperexcitability resulting from ionic (particularly calcium) dysregulation enhances microglial immune responses (e.g., increased pro-inflammatory cytokine signaling) that promote localized and systemic brain inflammation, thereby accelerating apoptotic and necrotic neuronal cell death via a process termed “immuno-excitotoxicity” [40]. Consequently, oxidative stress due to mitochondrial metabolic dysfunction, persistent inflammation arising from dysregulated immune signaling, and other cytotoxic processes (e.g., blood–brain barrier disruption, genetic damage, etc.) contribute to the progressive neurodegeneration characteristic of TBI; see [18, 39–41] for additional details. TBI therefore alters brain structure and function via multiple pathophysiological pathways at the molecular and cellular levels (some of which unfold acutely post-injury while others unfold longitudinally), ultimately producing the hallmark cognitive, behavioral, and emotional sequelae of head trauma.

TBI is further associated with numerous structural and functional alterations to neural circuitry at the network or systems level, beyond morphological and molecular changes to neurons, glial support cells, and the extracellular matrix. Patterns of neurocognitive dysfunction secondary to TBI are influenced by a host of factors, including those related to the incident (e.g., TBI due to blast injury vs. motor vehicle accident), physical characteristics of the trauma (e.g., site and force of primary impact), as well as the victim’s pre-existing vulnerabilities. Relevant patient factors include individual differences in: (a) “cognitive reserve” or baseline intellectual abilities [6]; (b) substance use and neuropsychiatric history, especially prior TBI; as well as (c) comorbid conditions resulting from the trauma, e.g., concomitant post-traumatic stress disorder or spinal cord injury. Neurocognitive deficits associated with TBI are often non-specific, however, most frequently involving impairments in attention, memory, socioemotional abilities (e.g., affective control; mentalization; self-referential processing), and EF, both lower-order cognitive control as well as higher-order mental operations, e.g., abstraction; decision-making; planning; problem-solving, etc. [4, 23]. The prefrontal cortex is considered the most important neurobiological substrate for EF; however, complex cognition relies on distributed activity throughout functional brain networks responsible for all input and output

operations comprising goal-directed behavior, e.g., monitoring, integrating, and inhibiting (task-irrelevant) sensory information in addition to coordinating and inhibiting (task-inappropriate) behavioral responses [23, 35, 38]. Core components of these functional circuits include cortical and subcortical nodes, hubs, and cerebral tracts in the frontal lobes as well as multimodal association cortices in temporoparietal regions [22, 23, 38, 42]. Deficits in EF necessary for activities of daily living may be difficult or impossible to detect with standard neuroimaging techniques routinely used in clinical settings [22, 42–44], and even neuropsychological evaluation may be insufficiently sensitive to fully capture subtle long-term neurocognitive consequences of (especially mild) TBI [2, 23].

Diffuse axonal injury (DAI) is the primary source of TBI-related neural circuit dysfunction, such that prominent researchers have referred to post-concussive syndrome as a “disorder of brain connectivity” involving disruption of multiple functional networks linking brain structure to cognition [38]. DAI refers to acute biomechanically-induced shearing of white matter tracts (i.e., bundles of myelinated axonal fibers), whose integrity is requisite to proper neurotransmission. Partially due to sustained hyperactivity of pro-inflammatory mediators (e.g., cytokines and chemokines; [41]), TBI produces widespread and potentially permanent white matter damage, implicating DAI in TBI-associated neurodegeneration – even in mild cases [22, 42]. Axonal white matter tracts are foundational to all neural circuits and networks; DAI thus interferes with communication throughout the brain, which helps explain the myriad cognitive, behavioral, and emotional symptoms following TBI [6, 22, 38, 45]. A 2018 meta-analytic review of neuroimaging data collected using diffusion tensor imaging – a method adequately sensitive to detect microstructural changes to white matter – indicates that axonal shearing frequently occurs throughout the *whole brain* in TBI (i.e., up to 95% of brain areas in mTBI and 100% in more severe cases), most commonly in subcortical regions of the hindbrain, the corpus callosum (commissural inter-hemispheric fibers), the internal and external capsules, as well as the frontal lobe [2, 22, 38]. These structural alterations may persist for years or even decades post-injury (regardless of TBI severity) with profound long-term impacts on cognition and behavior [2, 38]. Indeed, radiological evidence of DAI is a prognostic indicator of adverse clinical outcomes, which are three times more likely than in TBI cases without DAI, according to a recent meta-analytic review [42].

EF deficits (including impaired cognitive control) are hallmark symptoms of “dysexecutive syndrome” involving frontal areas and associated brain circuitry (e.g., frontoparietal or central executive network) affected by repetitive TBI/CTE, which are further characterized by attention and episodic memory impairment attributable to widespread axonal insult across relevant neural circuitry. Thus, CTE can be conceptualized as the long-term consequence of DAI [4]. Specifically, lesions to the cingulum bundle (connecting the ventromedial prefrontal cortex to the posterior cingulate) and other components of the default mode network correlate with post-TBI deficits in sustained attention and post-concussive symptom severity, whereas lesions to lateral temporoparietal, mesial temporal, and/or posterior cingulate/precuneus tracts contribute to learning and memory problems associated with CTE [6, 38], which are additionally reflected by hippocampal abnormalities observed after TBI [43]. The basal ganglia and limbic structures such as the hippocampus and amygdala are especially susceptible to TBI-related white matter damage [46–48], e.g., to the fornix, which comprises axonal projections originating in hippocampal neuronal cell bodies. In sum, the extant empirical literature suggests that TBI disrupts the functional connectivity of core circuitry necessary for cognitive and affective inhibitory control (e.g., corticolimbic, frontoparietal, and frontostriatal networks), particularly neural tracts connecting prefrontal cortical regions to

subcortical areas via the thalamus and between frontal hemispheres via the genu of the corpus callosum [22, 43–49]. DAI damage to prefrontal white matter tracts thus helps account for heterogeneous deficits in self-regulation capacities secondary to TBI/CTE that overlap considerably with psychiatric disorders and related phenomena, including suicide – one of the leading causes of TBI-related death [6].

2.1.2 Neurobiological correlates of suicide

Suicidal thoughts and behaviors share pathophysiological mechanisms with TBI, particularly disrupted functional connectivity in corticolimbic, frontoparietal, and frontostriatal circuits responsible for affective control and goal-directed behavior [9, 50–56]. The growing literature on the neurobiological underpinnings of suicide is mixed and remains challenging to interpret, however, given inconsistent definitions of SBs and sample heterogeneity. In particular, it is difficult to parse neurocognitive factors *specifically* involved in SBs that are also *not* associated with suicidal ideation, NSSI, and (frequently comorbid) “indirect” self-injurious thoughts and behaviors, e.g., substance misuse, disordered eating, etc. Such etiological commonalities (i.e., multi-final contributors to risk) support the notion of a latent p factor reflecting shared variance in these disparate clinical outcomes.

Broadly, SBs are characterized by structural and functional abnormalities in multiple regions of the frontal lobe, e.g., dorsolateral, orbitofrontal, and ventromedial prefrontal cortices, as well as the dorsal anterior cingulate [53, 57]. SBs are specifically associated with altered serotonin signaling in these areas, which may be reflected by cool EF deficits – particularly in cognitive inhibitory control and value-based decision-making; see Section 2.2.2 [50–57]. However, converging evidence indicates that suicide attempts and related self-harm *behaviors* (i.e., SBs and NSSI compared to suicidal thoughts) may be more strongly and/or specifically associated with impaired *hot* EF and corresponding dysfunction in *affective* inhibitory control over negative valence systems [9–11, 14, 33]. This notion aligns with evidence for SB-linked abnormalities in subcortical limbic (particularly morphological changes to the extended amygdala) and striatal regions; see [9] for a recent review.

Extant research on the neurobiological substrates of SBs implicates disruptions to the same neural circuits that are frequently damaged by TBI, albeit via distinct pathogenetic processes – though both often demonstrate a chronic, progressive course of symptoms. The etiology and pathogenesis of SBs, unlike TBI, are most directly influenced by genetic and epigenetic mechanisms (versus traumatic insult). SB heritability estimates range greatly, from 4–55% [9], and evidence suggests a genetic link between predisposition to suicidal thoughts and various domains of cognitive functioning relevant to the p factor, e.g., emotion differentiation [58]. Unsurprisingly, we observe similar genetic overlap between TBI outcomes and neurocognitive functioning (particularly EF), partially accounted for by the latent g factor of general intelligence [59]. The role of acute or prolonged psychological stress is well-established in SBs, particularly among individuals who are emotionally reactive (e.g., scoring highly on personality traits of neuroticism/negative emotionality/emotional instability) and/or characterized by poor self-regulation, i.e., proposed functional manifestations of the p factor. Varied contributors to distress are, correspondingly, known risk factors for SBs. My colleagues and I suggest that these disparate sources of vulnerability operate through a shared “equi-multi-final common pathway”, ultimately involving epigenetically-mediated dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis and associated stress reactivity. Due to allostasis, HPA axis dysregulation becomes self-maintaining via a positive feedback loop, leading to gray matter volume loss and functional dysconnectivity across multiple brain areas, including major serotonergic and

dopaminergic pathways originating in subcortical areas (i.e., the raphe nuclei and ventral tegmentum/substantia nigra, respectively) that project throughout the frontal cortex. Disruptions to these major neurotransmitter pathways, which are crucial for self-regulation of cognition, emotion, and behavior [60], mirror patterns of white matter damage frequently associated with TBI.

2.2 Overlapping neurocognitive profiles of TBI and suicide

2.2.1 Neuropsychological sequelae of TBI

As mentioned above, common clinical features of TBI include (a) EF deficits contributing to self-regulation impairment of attention, emotion, and motivation as well as (b) memory loss (typically acute in mild cases), whereas cognitive abilities in linguistic and perceptual domains are often relatively spared [4, 7, 8, 61]. Post-concussive neuropsychological dysfunction has profound consequences even in mTBI, however, with over half of patients experiencing continued cognitive decline up to five years post-injury [2, 4, 62], contributing to long-term functional impairment in activities of daily living [48]. Heterogeneity in clinical outcomes is attributable to both pre-TBI individual differences as well as characteristics of the injury itself, e.g., biomechanics of the trauma. Patient variables influencing TBI prognosis span several domains: (a) proxies for cognitive reserve and general intellectual abilities (the *g* factor), e.g., age, education, and genetic polymorphisms linked to neuroplasticity [59, 63]; (b) neuropsychiatric history (the *p* factor), e.g., prior TBI or pre-existing psychopathology [62, 63]; in addition to (c) poor sleep quality [4, 62, 64], which independently predicts psychiatric problems and SBs [9]. Moreover, up to 85% of mTBI patients report persistent sleep disturbances, likely exacerbating ongoing neurodegenerative processes underlying EF and learning/memory deficits [64].

Cognitive inhibitory control is the fundamental capacity that provides scaffolding for all higher-order EFs, comprising interference inhibition (executive attention) as well as early (action suppression) and late response inhibition (action termination; [9, 34]). Even other “low-level” EFs (i.e., shifting/switching and working memory updating) load on a latent factor (c.f., “the central executive”) whose variance is largely accounted for by inhibition [35]. Perhaps unsurprisingly, inhibitory control may be the cognitive capacity most vulnerable to traumatic insult, particularly in pediatric populations for whom TBI occurs within sensitive neurodevelopmental windows [65, 66].

Peri-traumatic and persistent memory impairment are also common in TBI. Autobiographical amnesia surrounding the traumatic insult is perhaps most pathognomonic, likely arising from acute brain damage (and accompanying transient neurological symptoms) sustained during the trauma [67]. Retrospective autobiographical amnesia may continue for a year or more in chronic or severe cases [68]. Learning and memory problems (including anterograde amnesia) are especially characteristic of moderate-to-severe cases, in which these issues demonstrate a more prolonged course than other cognitive symptoms [23, 69]. TBI also frequently involves impaired explicit (verbal and visual) memory on tests of both recall and recognition; however, TBI patients may demonstrate intact memory monitoring, at least retrospectively, i.e., providing accurate judgments regarding their relatively poor recall/recognition accuracy [69, 70].

2.2.2 Neuropsychological deficits in suicide

Cognitive deficits are transdiagnostic characteristics of psychiatric disorders [34, 37], which characterize 90% of individuals who die by suicide [71]. Similar to

TBI, EF and memory abilities comprise the primary affected domains of cognition in suicidal thoughts and behaviors. Meta-analysis indicates substantial episodic memory alterations among individuals with SB history [72], who tend to produce “over-general” descriptions of autobiographical events [73]. Whereas SBs have additionally been tied to diminished domain-general intellectual abilities, suicidal ideation may conversely be associated with *greater* general intelligence, reflecting the abundant mixed findings in this literature [74, 75]. Inconsistent conclusions notwithstanding, meta-analytic evidence confirms the association between SBs and cool EF deficits, particularly in cognitive control, and most reliably, impaired interference inhibition [9, 76–78]. Relatedly, SBs are further linked to poor probabilistic decision-making abilities [74, 77, 79–81], aligning with the fundamental role of inhibitory control to higher-order complex cognition, e.g., hot EF. Multiple studies report associations between self-injurious behaviors (including SBs) and dysfunction in inhibitory control over negative affect, specifically. Deficient affective control associated with deliberate self-harm (i.e., NSSI and SBs) might manifest at the *cognitive* level as poor negative emotional *interference* inhibition (driven by cognitive biases and/or insufficient executive attention) and repetitive negative thinking (e.g., ruminative brooding; [33, 78, 82–84]), whereas at the *behavioral* level, negative emotional *response* inhibition and heightened negative urgency (i.e., impulsive reactions to aversive emotions) likely reflect underlying affective control deficits in suicide and other self-injurious behaviors [9–11, 14, 85, 86]. Our recent work with high-risk psychiatric inpatients suggests that poor negative emotional response inhibition (measured at admission using an emotional stop-signal task [10, 85]) increases the likelihood of subsequent SBs up to one year post-discharge [14]. Difficulty inhibiting negative emotional reactions to self-harm stimuli on this task similarly predicts real-world NSSI urges over the following weeks measured via ecological momentary assessment [86]. Emerging evidence thus supports the notion that affective control impairment is a vulnerability factor for self-injurious behaviors (and not merely a neurobehavioral correlate). I refer readers seeking additional detail to the following contemporary reviews that examine the literature on cognitive deficits in suicide more extensively: [9, 74, 87].

2.2.3 Shared neurocognitive dysfunction as a mechanism linking TBI and suicide

Taken together, epidemiological, neuroimaging, and neuropsychological investigations into TBI and SBs yield several conclusions with important clinical implications. First, both neuropsychiatric phenomena are strikingly prevalent and each is associated with tremendous global economic burden, collectively accounting for over \$500 billion USD lost annually to direct and indirect costs [16, 25, 88]. Second, both syndromes involve heterogeneous etiology and clinical presentations, reflecting the inherent multi-finality of established vulnerability factors – many of which are also shared among these conditions, providing corresponding evidence for the equifinality of disparate contributors to neuro-psychopathology risk [4, 9]. Third, relatively more empirical work has sought to elucidate the pathogenesis of TBI, which ultimately reflects dual sources of brain damage that progressively unfold via distinct trajectories and time-courses: (a) acute focal lesions primary to the traumatic insult, both at the impact site and its “contrecoup” location; as well as (b) chronic neurodegenerative processes arising secondarily from host responses to injury, including ischemia, hormonal dysfunction, and disruptions to inflammatory signaling proximately caused by elevated intracranial pressure and maintained via epigenetic changes [4, 41]. Importantly, given that the majority of head injuries are classified as mTBI, the latter set of pathogenetic mechanisms may figure more prominently in chronic disability and dysfunction following repeated concussions [6].

As previously mentioned, head injuries elevate risk for developing later psychopathology, further contributing to the long-term health burden of TBI patients. For example, children who sustain a single mTBI are *twice* as likely to qualify for a psychiatric condition three years post-injury, particularly symptoms of attention deficit/hyperactivity disorder [5]. Overall, TBI is most strongly associated with disorders of emotional distress (i.e., anxiety, stress, and mood disorders), with approximately one-third (and possibly up to three-quarters) of patients experiencing psychiatric illness within five years of head trauma, often major depressive disorder and/or post-traumatic stress disorder (PTSD; [3]).

Much empirical work has focused on TBI-related PTSD, which is linked to the integrity of peri-traumatic memories [89–92] that may be reconstructed over time even without comprehensive encoding during the event [93]. Prolonged reconstruction of traumatic narratives, which characteristically lack consistency and coherence [91, 93], is unlikely to reflect recovery of “true” memories and might rather help explain the delayed onset of PTSD relative to other psychiatric sequelae of TBI [3]. Notably, attention deficit disorders, PTSD, and major depression each increase the likelihood of future SBs independent of brain trauma [71]. However, TBI itself doubles the odds of death by suicide, rates of which are *four times greater* among those with post-TBI psychiatric illness compared to the general population, even according to conservative estimates [94]. This pattern suggests that psychological problems partially mediate the relationship between head injury and SBs, which may occur in up to 60% of TBI cases [71].

The etiologies of depression, PTSD, and SBs following TBI are multifactorial, likely involving the modulation of gene expression associated with persistent inflammation and endocrine dysregulation, which mutually exacerbate continued neurodegenerative processes. Along with chronic pain – another well-established consequence of TBI [4] – depression and PTSD have been classified as “neuro-sensitization syndromes” maintained via shared epigenetic and neurocognitive mechanisms [95]. Specifically, TBI-induced epigenetic alterations to immune pathway signaling promote microglial dysfunction, triggering a cascade of elevated pro-inflammatory cytokine release and glutamatergic hyperactivity, which interact bidirectionally in a positive feedback loop of immuno-excitotoxicity [40, 96]. Burgeoning evidence similarly implicates epigenetically-mediated immune dysregulation and consequent brain inflammation in the pathophysiology of depressive disorders and SBs [71]. These transdiagnostic immuno-excitotoxic processes facilitate enduring – and potentially permanent (e.g., see [97]) – remodeling of micro-neuronal structure and function, eventually leading to progressive neurodegeneration and dysconnectivity in key brain areas necessary for learning, memory, emotion, and EF.

At the macroscopic level, frontotemporal [6] and limbic structures (e.g., the amygdala and hippocampus) may be most susceptible to morphological changes resulting from sustained release of inflammatory and excitotoxic factors, given the high concentration of glutamate and cytokine receptors in these regions [40]. Glutamate-driven hyperexcitability of the amygdala is hypothesized to generate an electrophysiological “limbic kindling” phenomenon, in which amygdala neurons become progressively sensitized [95]. This “neurosensitization” may be a biological mediator of prospective links between head injury and psychopathology, for example, by decreasing the threshold of limbic reactivity to stress arising from acquired cognitive deficits and socioemotional dysfunction. Secondary brain damage and attendant cognitive deficits arising gradually months or years post-TBI might therefore be comparably conceptualized as a neurosensitization syndrome, supported by high comorbidity rates with chronic pain, depression, and PTSD. Regardless, accumulating research supports the role of excitotoxic glutamate

signaling in neurodegeneration associated with chronic pain, TBI, as well as SBs and related psychiatric illness, e.g., major depressive disorder and PTSD [71].

Acute stress and nerve damage accompanying TBI further alter the expression of neuroendocrine genes, potentiating the secretion and circulation of glucocorticoids (e.g., cortisol) and other steroids that similarly modulate glutamatergic neurotransmission and consequently induce pathophysiological changes to vulnerable corticolimbic, frontoparietal, and frontostriatal circuitry [98, 99]. Coincidentally, functional connectivity in these brain networks is critical for affective and cognitive inhibitory control [9, 35]. Prolonged central nervous system injury secondary to physical trauma thus dysregulates the HPA axis, which relies on negative feedback to function properly, i.e., via hippocampal/pituitary cortisol receptors that eventually decrease in density and binding capacity with the continued release of stress hormones. Morphological alterations associated with chronic HPA axis dysfunction include prefrontal and hippocampal atrophy coupled with biphasic changes in amygdala volume (enlargement followed by reduction), which collectively overlap substantially with the pathophysiology of depression, PTSD, and suicide [71, 95, 98]. HPA axis dysregulation is another transdiagnostic feature of psychopathology and TBI that may ultimately manifest neuropsychologically as impaired affective control and other hot EF deficits associated with SBs [9, 71]. Externalizing variables that putatively reflect insufficient affective control (e.g., aggression, impulsivity, substance misuse) provide additional support for this notion, given their relationships with both elevated suicide risk *and* increased likelihood of head injuries, as well as their proposed role in exacerbating underlying diatheses for SBs unmasked by TBI [71].

3. Conclusions

In sum, compromised self-regulation of affect, behavior, and cognition acquired via neurotoxic molecular cascades following head trauma represent a set of neurocognitive mechanisms that help explain the effects of TBI on suicide vulnerability. These inter-related pathophysiological processes include chronically-enhanced free radical activity, glutamatergic excitotoxicity, and ongoing neuroinflammation triggered primarily by the initial mechanical injury and maintained secondarily by altered gene expression throughout the brain. TBI-induced neurometabolic cascades have profound consequences for neural structure and function, with downstream effects on HPA axis dysregulation, consequent heightened stress reactivity, and diminished affective control.

According to the recently proposed *g-a-p* model, domain-general cognitive ability (i.e., the *g* factor) interacts with latent vulnerability to psychopathology (i.e., the *p* factor) – manifesting as impaired affective control – to influence the etiology of transdiagnostic neuropsychiatric phenomena. This framework can be applied across multiple levels of analysis to explain shared risk factors and pathophysiology, high comorbidity rates, and prospective links between TBI and suicide. The *g-a-p* model specifically implicates an equi-multi-final common pathway to neuropsychopathology, involving (a) epigenetic alterations to immune/neuroendocrine pathways that disrupt HPA axis function, (b) consequent EF deficits in cognitive (cool) and affective (hot) inhibitory control at the neuropsychological level that manifest as (c) repetitive negative thinking (cognitive dysregulation), (d) urgency (behavioral dysregulation), and/or (e) heightened stress reactivity (emotional dysregulation). The empirical literature reviewed in this chapter aligns with the perspective that cognitive and affective inhibitory control (associated with the *g* and *p* factors, respectively) represent neurocognitive mechanisms underlying the

pathogenesis of SBs following TBI, while also independently elevating the likelihood of both neuropsychiatric phenomena.

From a practical perspective, the relationship between TBI and suicide is sufficiently clear to mandate routine risk assessment in acute care for head injuries. Providers less familiar with psychopathology may initially find such conversations uncomfortable. Suicide risk assessments are generally low-cost and simple to administer, yet avoided in many settings due to unfounded iatrogenic concerns, e.g., asking about suicidal thoughts might increase their incidence. Our recent research with psychiatric inpatients suggests the opposite may be true: evaluating patients' history of suicidal thoughts and behaviors reduces subjective distress and intent [100]. The TBI-suicide link also enjoins mental health clinicians to regularly assess for history of head trauma when evaluating new clients. The extant literature suggests that neurocognitive assessment may be indicated more broadly in determining suicide risk [9, 14], and that clinicians ought to be especially aware of suicidal patients' TBI history, which might necessitate a higher level of care.

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The occurrence of suicide often startles those who knew the involved individual. The public often cannot believe that the person who committed suicide could have engaged in such a seemingly irrational and extreme act. Similarly, health agencies often find themselves at a loss as to what strategies or policies might be employed to stem the seemingly constant flow of suicide. This book carefully addresses sociological, psychological, and physiological factors that contribute to suicide. It also presents strategies that might be employed to reduce suicide by way of public policies, psychotherapeutic strategies, and neurophysiological interventions.

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