A shock and plight scale for assessment of depression to prevent suicide in public figures

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Abstract

This paper proposes a scale that can be used by outreach activists for the assessment of depression to avoid suicide of public figures. This scale is developed based on known risk factors contributing to depression. Information on these risk factors is mostly available on celebrities and dignitaries from the sources in public domain, allowing the proposed scale to be used by an outreach activist, unlike all the existing scales including HDRS, PHQ-9, and BDI which require self-reporting by the subject. The risk factors are divided into plight and shock/trauma. The score assigned to the former varies over time, whereas the score attributed to the latter remains constant. Cumulative score of a subject on the scale is estimated on any point in time under study as an algebraic sum of individual scores assigned to individual risk factors. Subjects of study are celebrities, who were studied through their profiles, biographies, interviews, and news items available in public domain. They were scored on the proposed scale considering the life events and situation facing them. Out of 18 subjects, 9 were suicidal and 9 were non-suicidal. The scale appears to provide clear dichotomy between suicidal and non-suicidal subjects. The Student's t-test suggests that the proposed shock and plight scale can be used to assess depression and identify individuals who are potentially at a risk of suicide.

Keywords: Mental health, student's T-test, risk factors, depressive symptoms

Introduction

A WHO finding attributes 1% deaths to suicide, which is more than those caused by HIV, malaria, breast cancer and homicide (WHO, 2019). The cause behind, at least 50% of suicides is the long-term depression. Depression is a common yet severe mood disorder. Long term depression may become a serious health condition. A recent survey conducted by The Global Burden of Diseases shows that one of the two most challenging mental disorders was depression (Anonymous, 2022). Depression if left untreated can lead to suicide. Timely evaluation of depressive symptoms can help outreach programs by socially active groups to intervene, proactively and prevent suicide. According to a study, every 115 people are exposed to a single suicide, with one in five reporting that this experience had had a distressing effect or caused a significant disruption to their lives (Fu et al., 2007).

Depression knows no boundaries and affects people from all walks of life including celebrities. The recent surge in the incidence of suicide among celebrities is worrisome and calls for immediate response from researchers, mental and public health professionals, and policymakers.

From 2002 to 2019, sixteen celebrities committed suicide in India (Mamun et al., 2020), while in South Korea twenty-four celebrities committed suicide due to depression from 2010 to 2017 (Lee, 2019) . Whereas in Pakistan, there are no vital records or reliable statistics available on suicide deaths (Pritchard., 2020). Celebrity suicides insight suicidal ideation among public over a short as well as over a long term. It is highly likely that a celebrity's suicide follows the Werther effect (Ha and Yang, 2021).

Mental health needs of celebrities are complex, often ignored by the sufferer due to various psychological concerns such as mistrust, isolation, and fear of losing fame (Kar et al., 2020). These concerns could be the reason for the lack of treatment-seeking behavior and consequently access to the right supportive care. Such situations call for an outreach approach on the part of the supportive caregivers to the celebrities, other dignitaries with high profile and on the part of the employers to their employees. However, current methods of evaluating depression are viable only when a patient either proactively approaches a caregiver or is willing to do a self-assessment. For example, widely used questionnaires like Hamilton Depression Rating Scale (HDRS), Patient Health Questionnaire (PHQ-9) (Ma et al., 2021) and Beck's Depression Inventory (BDI) (Beck, 1961) include questions on suicidal thought and mood swings which can only be responded to by a person themselves, which makes these scores impracticable for an outreach activity.

Hence, we present a depression scale that caters the need for a means that allows an outreach program to evaluate depression of anyone whose data can be obtained from the biography or life events of the concerned available in public domain.

In our study, we have included the subjects for which we could find enough information on their personal and professional life. Information on life events such as separation, alcoholism, legal issues, financial crises, health issues, work stress, childhood trauma, disability, etc. was collected to account for score on individual factors in the scale.

Materials and Methods

There are many risk factors of depression including childhood trauma, relationship crisis, and financial crisis. After a thorough survey of research carried on depression and studying several cases of suicide attempts by subjects from assorted occupations and demographics the following 12 risk factors have been identified.

F1. Legal issues: Legal proceedings involve detrimental effects to mental health of both plaintiffs as well as defendants. A controlled study on a sample of 200 patients including men and women in equal number, concluded that facing legal issues is a considerable risk factor contributing to depression (Rashid and Haider, 2008; Clemente & Padilla-Racero, 2019).

F2. Work Stress: Research teams working in Korea and USA suggest that a consistent occupational/work-related stress also adds to depression (Woo, and Postolache, 2008).

F3. Relationship crisis: A research conducted to examine the role of trauma, betrayal, and appraisals establishes betrayal/interpersonal trauma causes adverse psychological consequences (Goldsmith, et al., 2011).

F4. Financial Crisis: An analysis conducted to understand the impact of financial crisis on mental health suggests that financial crisis and unemployment cause long-lasting stress and ultimately depression. Moreover, unemployment is strongly correlated to suicide; every 1% increase in unemployment is found to be associated with a 0.79% rise in suicides (Christodoulou, & Christodoulou, 2013).

F5. Health issues/Burdensomeness: A clinical research by Goodwin and Gurhan (2006) shows that long-term illness raises the chances of acquiring a serious depressive disorder. It is natural that any severe and/or chronic illness poses a danger to a person's sense of purpose and meaning in life. As a result, the sickness may trigger a vulnerable person to experience a depressive episode due to a life event or chronic problem. Thus, prolonged illness could be a part of the complicated process that leads to the onset of depression (Gürhan, et al., 2019).

F6. Alcohol/Substance abuse: An investigation supported by the Charles A. King Trust and Biomedical Scientific Research Grant in a college at Boston concluded that long-term use of substances such as alcohol, marijuana, cocaine, heroin, and methamphetamine can trigger or escalate sadness, lethargy, and/or other negative emotions and depression (Deykin et al., 1987).

F7. Bullied: Bullying is a repetitive behavior (Kaltiala-Heino, & Fröjd, 2011). A study conducted in Netherlands found that bully victims had significantly higher chances for depression as compared to the ones who never experienced bullying (Velderman et al., 2008).

F8. Assault: According to a study conducted using Traumatic Events Survey (TES) and research funded by National Institute of Mental Health shows that both men and women more likely suffer from depressive symptoms after undergoing a physical/psychological violence. Even after passing of 14 years since the last adult sexual assault, the victims reported significant distress (Elliott et al., 2004;Thurston et al., 2019).

F9. Childhood trauma: Childhood trauma involves adverse life events occurred till 18 years of life. In a German LAC (long treatment of chronically depressed

patients) Depression Study, 349 chronically depressed patients completed a Childhood Trauma Questionnaire, a self-report measure of traumatic experiences in childhood. 75.6% of the patients reported clinically significant histories of childhood trauma. It is shown by empirical findings that emotional neglect and abuse cause an increase in vulnerability to develop a major depression in adulthood (Negele et al., 2015). Lund et al. (2008) found that childhood bully victimization could also cause trauma severe enough to lead to depression in adulthood.

Table-1: Method for scoring the risk factors

Risk Factors	Initial value (X_0)	Annual Change (Δ)	
		Persistent	Non-persistent
F_1. Legal issues	1 to 5	+1	-1
F_2. Work stress	1 to 5	+1	-1
F_3. Relationship crisis	1 to 5	+2	-2
F_4. Financial crisis	1 to 5	+2	-2
F_5. Health issues/ Burdensomeness	1 to 5	+1	-1
F_6. Alcohol/Substance use	1 to 5	+1 to +3	-1
F_7. Bullied	1 to 5	+2	0
F_8. Assault	5		
F_9. Childhood trauma	5		
F_{10}. Death/Bereavement	4	0	
F_{11}. Genetics	5 to 10		
F_{12}. Disability	3 to 10		

F10. Death/Bereavement: A psychobiological research conducted by A. Seiler, R. Känel and G.M.

Table-2: A hypothetical example of scoring on shock and plight scale

	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9	Y_{10}
F_1	0	0	0	0	0	0	0	3	4	5
F_2	0	0	0	0	4	5	6	7	8	9
F_3	0	5	7	9	7	5	3	5	7	9
F_4	0	0	0	0	0	0	0	0	0	0
F_5	0	0	0	0	0	0	0	0	0	0
F_6	3	4	6	7	8	10	10	10	10	10
F_7	0	0	0	0	0	0	0	0	4	6
F_8	0	0	0	0	0	0	0	5	5	5
F_9	5	5	5	5	5	5	5	5	5	5
F_{10}	0	0	0	0	0	0	0	4	4	4
F_{11}	5	5	5	5	5	5	5	5	5	5
F_{12}	0	0	0	0	0	0	3	3	3	3
X_n	13	19	23	26	29	30	32	47	55	61

[F_i= i^{th} factor, $Y_n = n^{th}$ year, X_n= Total score in n^{th} year]

Slavich concluded that death/bereavement of a beloved causes severe physical and mental health issues (Seiler et al., 2020).

F11. Genetics: Strong evidence for the role of genetic variables in the risk of depression has been found in family and twins studies. A meta-analysis of twin study data, for example, found that depression had a 37% heritability rate, and data from family studies reveal a two- to threefold increase in the risk of depression in first-degree offspring of patients with depression. In severe forms of depression, heritability has also been proven to play a significant role (Shadrina et al., 2018).

F12. Disability: A study funded by China Medical University, Asia University, the Health Promotion Administration, and Buddhist Dalin Tzu Chi Hospital, Taiwan concluded that sudden loss of limbs, mobility, sight, or hearing or any such disability is reported to have a positive relationship with depression. Almost all investigations show the disabled to be notably more psychologically disturbed. Adults with physical/sensory disability are 3.7 times more likely to be depresses than the general population (Shen et al., 2017).

Above mentioned risk factors can be divided into two categories i.e., Discrete events (shock) and plights (prevailing situations). Discrete events are sudden events happening at a single point in time and do not persist beyond the event itself, however, leave a lifelong imprint on the sufferer. Plights, in contrast, are conditions that persist over a period in time and can either decrease or increase in severity. For example, financial crisis or relationship crisis are remediable and their contribution to depression varies over time. Depending upon the situation a practitioner may assign an initial score between 1 and 5 to any risk factor from F_1 to F_7. Their score increases with time until situation improves or resolves. However, all risk factors saturate at a maximum score of 10. In contrast, the score due to genetics and irreparable loss like death/bereavement leave a one-time lifelong impact and hence contribute a constant score with every recurrence and shall not exceed a cumulative score of 10 in the risk factors from F_8 to F_{12}.

The method for scoring the risk factors of depression proposed in this paper, their initial scores and their visible division as plights and shock are shown in Table-1.

The proposed depression score is defined as in equation (1).

$$X_n = \sum_{i=1}^{12} F_{ni} \tag{1}$$

Where, F_{ni} and X_n represent score of ith risk factor in the nth year and total score in the nth year respectively. The F_{ni} can be calculated using equation (2).

$$F_{ni} = X_{i0} + \sum_{m=1}^{n} \Delta_{mi} \qquad (2)$$

Where, X_{i0} represents the initial value assigned to the ith risk factor, n represents the year of persistence of a risk factor, and Δ_{mi} represents annual change in the ith risk factor in the mth year.

Table-2 presents a hypothetical character exhibiting all above-mentioned risk factors including shocks and plights that vary with time. Symbol Y_n shows n^{th} year of study. Note that the values of F_1 through F_7 keep changing, whereas F_8 through F_{12} are constant.

The information on the presence of these risk factors in a subject can be obtained from one's social media accounts, professional networks, and colleagues at workplaces, close relatives, friends, print media, and electronic media.

Results

We evaluate 18 subjects, all celebrities from different countries, including actors, singers, journalists, chefs, and other professionals, using the shock and plight scaled described above. Half of the subjects were suicidal and half of them were non-suicidal cases.

Information on the presence of the risk factors was collected from internet sources including online biographies, such as those on Wikipedia, authentic news items from online newspapers such as Guardian, New York Times, news channels such as BBC, CNN, and interviews available on YouTube (Anonymous, 2018).

Table-3 and Table-4 show yearly scoring of a suicidal and a non-suicidal subject respectively, each of them studied for a period of 13 years. The former scored 34, whereas the latter scored only 15. The yearly scores of these subjects are plotted in Figure-1 for the matter of comparison.

Suicidal and non-suicidal subjects, their occupations, their total years

under study and their concluding scores after assessment are shown in Table-5. It appears that suicidal and non-suicidal subjects can be delineated linearly with the threshold score of 20, in the limited cohort under study.

Discussion

This study has identified and accounted for major risk factors contributing to depression to evaluate an individual on the recommended depression scale. These risk factors can be easily measured by the outreach activists from the life events of celebrities and dignitaries, which are known in public domain.

Table 3: Scores of a subject who attempted suicide.

	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9	Y_{10}	Y_{11}	Y_{12}	Y_{13}
F_1	0	0	0	0	0	0	0	0	0	0	0	3	4
F_2	0	0	0	0	0	0	0	0	0	0	0	0	0
F_3	0	5	7	9	10	10	10	10	10	10	10	10	10
F_4	0	0	0	0	0	0	0	0	0	0	0	0	0
F_5	0	0	0	0	0	0	0	0	0	0	0	0	0
F_6	0	0	0	3	5	7	9	7	5	7	9	10	10
F_7	4	4	4	4	4	4	4	4	4	4	4	6	10
F_8	0	0	0	0	0	0	0	0	0	0	0	0	0
F_9	0	0	0	0	0	0	0	0	0	0	0	0	0
F_{10}	0	0	0	0	0	0	0	0	0	0	0	0	0
F_{11}	0	0	0	0	0	0	0	0	0	0	0	0	0
F_{12}	0	0	0	0	0	0	0	0	0	0	0	0	0
X_n	4	9	11	16	19	21	23	21	19	21	23	29	34

[F_i= i^{th} factor, Y_n = n^{th} year, X_n= Total score in n^{th} year]

Table-4: Scores of a subject who is living a happy life

	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9	Y_{10}	Y_{11}	Y_{12}	Y_{13}
F_1	0	0	0	0	0	0	0	0	0	0	0	0	0
F_2	0	0	0	0	0	0	0	0	0	0	0	0	0
F_3	0	0	0	0	0	0	0	0	0	0	5	7	5
F_4	0	0	0	0	0	0	0	0	0	0	0	0	0
F_5	0	0	0	0	0	0	0	0	0	0	0	0	0
F_6	0	0	0	0	0	0	0	0	0	0	0	0	0
F_7	0	0	0	0	0	0	0	0	0	0	0	0	0
F_8	0	0	0	0	0	0	0	0	0	0	5	5	5
F_9	5	5	5	5	5	5	5	5	5	5	5	5	5
F_{10}	0	0	0	0	0	0	0	0	0	0	0	0	0
F_{11}	0	0	0	0	0	0	0	0	0	0	0	0	0
F_{12}	0	0	0	0	0	0	0	0	0	0	0	0	0
X_n	5	5	5	5	5	5	5	5	5	10	15	17	15

[F_i= i^{th} factor, Y_n = n^{th} year, X_n= Total score in n^{th} year]

The results of eighteen celebrities show that the two samples of suicide and non-suicide stand far apart on the recommended depression scale. Performing two-tailed student-T test on the two samples of suicide and non-suicide confirms this. Excluding the two non-suicide cases with a 0 score, the number of suicide and non-suicide cases becomes $n_1 = 9$ and $n_2 = 7$, respectively. This gives the t-value of 6.80, the degree of freedom $df = 14$, and the critical value of 2.98 for 99.9% significance level ($\alpha = 0.01$). Since the t-value is much greater than the critical value, the null hypothesis (H_0) that the two samples are not statistically significantly apart stands rejected.

Conclusion

This paper proposed a scale based on shocks and plight to evaluate depression in the public figures like celebrities and dignitaries. The information on risk factors including shocks and plights was gathered from the life events of the subjects under study, which included 18 celebrities from assorted geography. The findings based on Student's T-test suggest that the recommended depression scale is a strong predictor of suicidal behavior or ideation. However, more subjects can be investigated to gather more intricate details on this highly challenging task of quantifying depression. Including more subjects to the study may also help fine tune the weights assigned to the risk factors.

Table-5: Subjects and their final depression score.						
Subject	Category	Nationality	Profession	Years of study		Total score
				From	To	
1	Suicidal	American	Chef	1975	2018	22
2		Swedish	DJ	2011	2016	20
3		British	Actress	2008	2020	34
4		American	Singer	1983	2017	28
5		American	Singer	1977	2017	22
6		South Korean	Singer	1998	2019	40
7		American	Singer	1998	2005	36
8		American	Comedian	1975	2014	38
9		South Korean	Singer	2014	2019	21
10	Non-suicidal	American	Singer	2008	2020	15
11		American	Chef	1981	2019	8
12		French	DJ	2000	2019	10
13		American	Actress	1978	2019	8
14		South Korean	Actor	1995	2004	5
15		British-American	Journalist	2001	2012	0
16		British	TV Presenter	2012	2020	1
17		British	TV personality	2008	2020	3
18		American	Singer	2008	2018	0
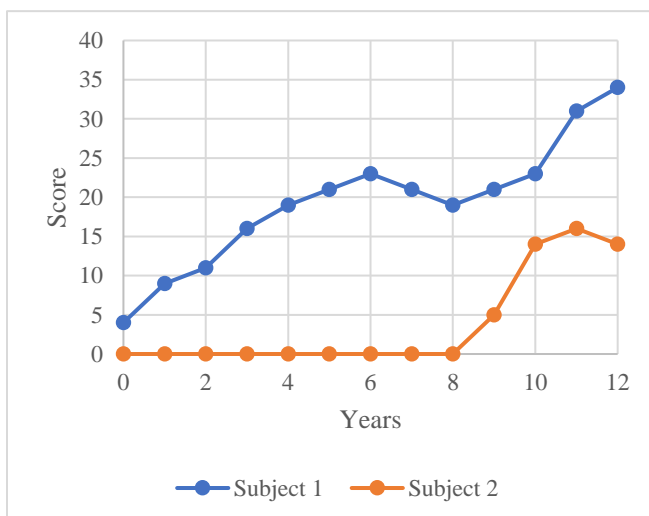
Figure-1: Time curve of the total depression scores of subjects 1 and 2

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