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Predictor Profile to assess Recurrence Phenomenon of Suicidal Incidents among Region Based Target Population

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Abstract

Suicidal attempts have a very significant effect on the society, and they also reflect on the efforts of the supporting health care and counseling facilities and the therapist involved. The impact of suicide is further magnified by the needs of persons who attempt suicide multiple times, requiring emergency health care and rehabilitation. Preventing such activities becomes a major task for the support providing agencies as soon as clients with such tendencies are identified. There are repetitive traits that can be observed during the therapeutic program among the high-risk group individuals, who are susceptible to this kind of activity and such traits indicate for a specific profile. The aim of the instrument is to prevent the occurrence of the repetitive suicidal attempts of the clients in Washington State, which has one of the highest suicide rates. This profile has been constructed on the various parameters recognized in the statistical analysis of the client pool in Washington State, who have been under treatment for their suicidal behavior. This predictor indicates the probability of clients who attempt suicides repetitively by matching the parameters of the profile with that of the client. Building a profile for the purpose of predicting behavior of this kind can strengthen the intervention strategies more comprehensively and reduce such incidents and health care requirements and expenses.

Keywords

Instrument; parameters; predictor; risk category; suicide

I. Introduction

Washington State has the 16th highest suicide rate in the nation and suicide is the eleventh leading cause of death with 814 death reported in year 2005 with a rate of 13.1 incidents per 100,000 (age adjusted) of population, compared to the national US rate of approximately 11.0 (7) (Figure 1). Attempts of suicide can be five time or more than the actual suicide rate (12). The frequency of suicide attempts can be more, if the causative factors are not resolved. There have been consistencies in reports that even after getting initial medical and other support services, patients attempt suicide again in Washington State with similar rate as without the interventions (1). During 2003–2005, males in Washington accounted for 79% of completed suicides, with the highest rate of suicide, observed in the group among the age group of 75 years and more. (6).

In 2004, suicide was the second most leading cause of death and altogether 17% deaths in the 15 – 24 age group (10). Nearly two-thirds of teens with clinical depression go unnoticed and may not get treated, among these, males 15 to 19 years old are 5 times more likely than females to complete suicides (2) (figure 2.).

Preventive procedures have been particularly promoted to reduce such incidences which have priority concern to precisely identify target population. Development of a predicting instrument, which can provide appropriate behavioral evaluation, can be one of the choices to this requirement. This instrument is based on set of primary repetitive characters, which can provide a predictable analysis of such behavior among the high-risk group individuals, who are susceptible to attempt suicide. The concept of predictor is to identify the patients with tendency to attempt suicide and inform the healthcare professionals and people in contact, to prepare and implement specific therapeutic plan to minimize such incidents further. A predictor profile for the purpose of interpreting specific behavior would strengthen the intervention strategies, reduce the frequency of such incidents, and regularize involvement of health care and financial resources.

II. Methodology

Data source for the profile analysis has been collected from yearly published hospitalization reports of suicide incidents from Washington State public health statistical data bank, Washington State Injury and Violence Prevention Program, 2008; and GIS from 2002 to 2006 year. Data of a total of 15,826 patients cases with single or more than one incident of identified suicidal attempt history during the interval 2002–2006, between the age group of 15 and 75 + years, have been included in the study. Significant cohort parameters have been studied from the target population for the development of the instrument, namely gender, age groups, health condition, anthropological, biological and environmental factors (namely economic, academic, social, ethnic, cultural background, community). Statistical analysis has been performed to identify repetitive features of the parameters with rate and frequency comparisons on a yearly basis. Highly repetitive prevalent features observed in the evaluation have been consigned under high risk category, average repeating features as intermediate and less frequently occurring features as low risk category. These features have been broadly grouped as parameters of interests and the evaluations from forthcoming data

have been systematically and regularly directed to develop the accuracy of the instrument. These parameters were constructed in the form an analog pathway with the prominent parameters evaluated initially and all the features of each parameter undergo comparison for profile matching. A follow up evaluation assessment has been conducted for comparing this profile with the data from new reports to evaluate the predictability.

III. Results

The parameters are assessed in relation to the numbers of attempts and actual suicide incidents reported between year 2002 and 2006.

The age groups 15–24 and 35–44 yrs have the maximum incidents of attempted suicides (Figure 2). The largest conversion of the attempts into actual suicide is demonstrated by the age group 45 – 54 yrs and from 2002 year onwards, there is a steady increase in the rate of suicide and suicide attempts in this age group (Figure 3). Among adolescent and young age groups, approximately 25% of attempted suicide by youth male results in death; whereas three – four percent deaths result in females. 15 to 19 year old males are five times more likely than females to commit suicides. Suicide comparison ratio among the adult male and female patient population rate has been measured as 7:2, which is evident from the finding that during 2003–2005 period. Males in Washington accounted for 79% of total suicides, though majority of females have attempted suicides with a percentage of 62% (Figure 4.). Caucasian and American Indians demonstrate largest proportion of actual number of suicidal attempts and incidents as 14 every 100,000 resident population each.

Poisoning is identified as the most common means for attempted suicide cases among 15 – 24 and 35 – 54 age group whereas firearms are as the most common means among the young and adult groups for committing suicide.

Based on the results of statistical analysis and evaluations, characteristics have been identified and incorporated for the development of the instrument are- gender, age group, ethnicity, health and social condition, education, and exposure and access to perform self-fatality (Figure 5). Follow – up evaluations with parameters evaluated from various new case studies (a total of 627 case data) randomly, indicated results in compliance with an accuracy of more than 90% of the total cases, when the parameters are run through the analog model.

IV. Discussion

Age groups 15 – 24 and 35 – 54 year have demonstrated the majority of incidents of suicide and suicidal attempts. Parallel emergence of economic hardship can be projected as one of the reasons for the growth of suicide rate among the 45 – 54 year age group (11). Higher suicide rate among is recorded among males, approximately 25% of attempted suicide by youth male results in death, whereas 3 – 4% death results in females, though higher attempt rate among females is observed (9). Similarly, data reflects that in Caucasian and Native Indian group suicide is frequently occurring though African-American, Asian and Hispanics do not demonstrate significant numbers. High competition, depression, economic and social hardship can be observable factors among Caucasian; family predisposition, abuse,

addiction and health concerns with Native American (8). Among African American communities, some of the major factors are community segregation, economic hardship and access to weapon; though cultural encapsulation and stress is prevalent among other minority groups. Health conditions, medical, mental (depression, substance abuse, ideation and other condition like family history, sexual orientation and abuse, disability) show higher probability of suicidal incidents (3). From 2002 year onwards, there is a steady increase yearly, in the number and rate of suicide incidents in the 35 – 54 age groups, which has also been identified with rise in financial and family crisis and PTSD as a leading cause of depression (4). Individuals with physical and sexual abuse have four times higher suicide attempt rate than non-abused. Poisoning is the most common means for attempted suicide cases among 15 –24 and 35 – 54 age group though firearms are the most common means among the young and adult groups for committing suicide. Linear regression of suicide rate has been observed with progression of academics in the statistical evaluation (figure 4.). In Washington, for year 2000–2002 combined, suicide rates increased as the proportion of people living in poverty increased, though data is not sufficient enough to identify relation to economic hardship (5).

V. Conclusion

Attempted suicide and suicide are very intricate events that develop from the interplay of mental, social, biological and psychiatric features. Extent for emotional and physical pain cannot be assessed for individuals and their relatives, though approximately three billion US Dollars of loss has been recorded due to suicidal incidents (3). The complexity of suicidal behavior and ideation requires multiple and immediate preventive approach. Application of a predictor instrument can supplement targeting population, requiring adequate health care services to prevent suicide, which otherwise may not be identified in due course. Since much published material and clinical experience demonstrate a number of causative factors associated with suicide, the early identification and appropriate treatment of this condition is an important strategy for prevention. Further improvements can be introduced with the inclusion of data from minority groups. Administrative encouragement for broadening data collection for possible suicidal attempts and minority groups from both fatal and non-fatal suicide incidents, introduction and usage of the instrument at the community level for example academic institutions, old age homes; and further study on biological and environmental factors can assist validating data. Design, planning and Implementation of intervention strategies for newly growing suicidal incidents in the 45 –54 yr age group should be focused appropriately. Research has not yet evaluated the relative importance of race, ethnicity, poverty, and education in relation to rates of suicide, further scope of study may identify relative measurements. Similarly further study and resource development on biological basis and environmental factors require adequate scope of investigation. The events and features of suicidal behavior vary with area – specific factors. Further research may also suggest scope of development for area specific customization. A preliminary investigation into the above-average suicide rate in the Kutznetzk Basin, Russian Federation, between 1980 and 1995 cited economic instability, the disintegration of the former Soviet Union and other. In the past 20 to 30 years, suicide rates have increased strikingly among indigenous peoples in both Australia and Canada (13). In Bosnia and Herzegovina; higher-

than-expected rate of suicide as well as alcohol dependence is observed among children. While they had survived the most immediate threats of the armed conflict during 1992–1995, the children had succumbed to long-term stress (13). Depending upon the various factors and parameters in different world locations, with specific standardization, an appropriate construction of the predictor instrument and evaluation may be utilized for similar diagnostic procedures.

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Figure 1.
Suicide rate per 100,000 of population.

Figure 2.
Age-group based comparisons of suicide frequency.

Figure 3.
Yearly distribution of suicide frequency among various age-groups.

Figure 4.
Yearly total suicide frequency and graphical analysis.

Figure 5.
Analog construction of Predictor Instrument.