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Risk Factors of Suicidal Behaviors and Interventions: A Literature Review

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Abstract

This study analyzes current research on suicide (attempt and completed), drawing on theories of suicide from a variety of fields, including biology, social science, and psychology, and synthesizing and integrating the research's strengths and weaknesses. Through an extensive search of the PsycArticles and PsycInfo databases, 100 articles are selected for literature review. Both the internal (mental disorder, alcohol abuse, prior suicide attempt) and external (family conflict and unemployment) factors that contribute to suicide (attempt & completed) are examined in detail in relation to the psychological interpersonal model. Under the model proposed by Van Orden that suicidal ideation was associated with a sense of thwarted belongingness and perceived burdensomeness, this article analyzes how these internal factors and external factor contribute to suicidal behaviors. Additionally, intervention measures are proposed according to risk factors, such as positive cognition or appraisal of life events, effective social support, professional training from health care providers and etc.

Keywords

Suicide, suicide attempt, risk factors, interpersonal theory of suicide, pathway

1. Introduction

Suicide is defined as intentionally taking one's own life through any method. A suicide attempt is a deliberate act of self-destruction that is not fatal (Crosby et al., 2011). Suicide is the second leading cause of death. Although studies of suicide risk factors have been gaining widespread attention among researchers, risk factor measurement is not uniform. For example, based on autopsy records, when data on suicides caused by alcohol abuse are collected, blood alcohol concentrations of illegal motor vehicle drivers are used as a cut point, but samples of suicide people (completed or at-tempted) are not used as a control group for comparison (Cherpitel et al., 2004). Additionally, the majority of studies currently examine the correlation between a single risk factor and lethal behaviors, but could not establish a causal relationship, nor do they employ comprehensive models to interpret the pathways between the risk factors and suicidal be-

haviors (Elliott et al., 2005; Lee & Bae, 2017; Renaud et al., 2008). This article synthesizes previous research, considers the concepts of completed suicide and suicide attempts, analyzes the internal and external risk factors, and explains the mechanism of suicidal behaviors according to the interpersonal theory model.

1.1. Suicidal Behaviors in Biology

Suicide risk factors have been extensively studied in a variety of fields. In biology, suicide has been demonstrated to be hereditary. Knopik et al. (2004) studied 2708 twins in Australia and discovered a 47% concordance between twin suicidal ideation and suicidal behaviors. Similarly, Anguelova et al. (2003) demonstrated through two meta-analyses that the 5-HTT gene influenced neurotransmitter stability and that low serotonin levels were associated with impulsivity and aggression, which may result in suicidal behavior. However, Lin and Tsai (2004) demonstrated that there was no association between 5-HTTL polymorphisms and suicidal behavior using three meta-analyses, with the differences in results primarily due to sample group differences. Nevertheless, the aforementioned studies established a correlation between biological factors and suicidal behaviors but not a causal relationship.

1.2. Suicidal Behaviors in Sociology

In sociology suicide is associated with a lack of social integration. Durkheim (2005) was the first to suggest that when individuals were not integrated into a collective, their individual lives became meaningless and empty; Specifically, single people committed suicide at a higher rate than married people. While his theory explained certain phenomena in terms of society as a whole, it omitted the factor of individual differences. As a result, numerous subsequent studies contradicted with Durkheim's theory. In a 14-year case-control study conducted by Wilkinson and Bacon (1984), 230 male and 228 female schizophrenics were evaluated and it was determined that marital status was not associated with suicide. Zhao and colleagues (2015) also demonstrated that marital status had no statistically significant relationship with suicide using a semi-structured questionnaire administered to 155 suicide attempters between 2010 and 2014.

1.3. Suicidal Behaviors in Psychology

Suicide is associated with severe psychological pain in psychology. Kovacs and Garrison (1985) proposed the theory of hopelessness, arguing that desperation can affect five cognitive systems, namely cognition, emotion, motivation and behavior, physiology, and conscious control. When one of these five factors was stimulated, the other four factors were also activated as a result of the interaction among these five factors. Consequently, hopelessness resulted in suicide. Van Orden et al. (2010), on the other hand, argued that no single factor can cause suicide and proposed an interpersonal theory of suicide based on previous frameworks (Joiner et al., 2005). Van Orden asserted that suicidal ideation was associated with a sense of thwarted belongingness and perceived burdensomeness, and that the capacity to commit suicide can be acquired through repeated exposure, confrontation, and reinforcement of the experiences (Figure 1). The interpretation and perception of life events were the model's central tenets. Suicidal individuals believed their decision to die adds value to others. Additionally, the model demonstrated that suicide was an act that goes against instinct and thus requires practice to master. Based on the interpersonal theory of suicide, this study examines internal and external risk factors associated with suicidal behaviors, including mental illness, alcohol abuse, previous suicide attempts, family conflict, and unemployment. It also proposes interventions according to the risk categories.

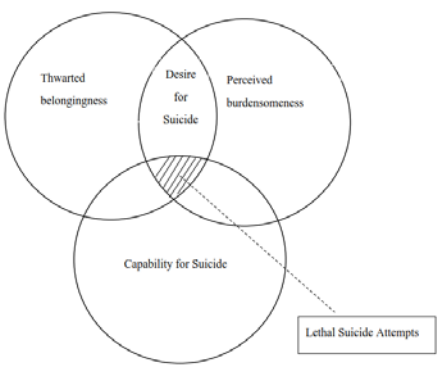

Figure 1. Interpersonal Theory of Suicide.

Note. Retrieved from 'The interpersonal theory of suicide' by Van et al. (2010). Psychological Review, 117(2), 575-600. doi: 10.1037/a0018697.

2. Method

A broad search strategy was used to identify articles, including searching the PsycArticles and PsycInfo databases for key words associated with risk factors, such as mental disorder/alcohol abuse/previous suicidal attempts/family con-flict/unemployment along with suicide (attempted and completed). The following filtering was performed on the articles found: articles that did not explicitly mention risk factors in conjunction with suicide in the abstract were excluded; articles that did not provide measurement of risk factors were excluded; Articles containing only one measurement method were excluded, and studies dating from 1986 to 2021 were used to compile report. A total of twenty articles were selected for each suicide risk factor.

3. Result

The detailed information about 100 reviewed articles is organized in Table 1.

4. Discussion

4.1. Internal Factors

4.1.1. Mental Disorder

Mental disorder is highly correlated with suicide due to decreased treatment adherence, and psychological burden which contributes to suicidal behaviors (Table 1). In terms of specific pathways, Foley et al. (2008) assessed 107 pa-tients with mental disorder over a two-year period by using Depression Scale (DSM-IV) and the Suicidal Ideation Scale and discovered that patients who attempted suicide scored significantly higher on the Insight of Treatment domain than those who did not attempt suicide, which is a risk factor for perceived burdensomeness (Foley et al., 2008). It was reasonable to conclude that the high cost of medical care made patients feel like a burden on their families and fosters feelings of guilt. Additionally, society stigmatized people who suffered from mental illness, which reinforced interna-lized shame and exacerbated negative feelings of thwarted belongingness (Kaushik et al., 2016). Additionally, these patients were aware of medication side effects and developed the capacity to commit suicide by gradually increasing the dosage and repeatedly exposing themselves to physical pain (Nock et al., 2013).

However, some scholars disputed the association between insight of treatment and suicide (Hawton et al., 2005), and researchers analyzed 29 case-control studies involving schizophrenic patients and concluded that insight of treatment could not be treated as a risk factor for suicide. The disparate findings were due to the study's small sample size and high statistical heterogeneity. Additionally, Lincoln and colleagues (2006) argued that by adjusting the metacognition of the treatment process, the beneficial effects of insight could be increased, accordingly, patients with mental disorders could be more compliant with medication. Thus, positive metacognition is a protective factor for patients with mental illness.

4.1.2. Alcohol Abuse

Studies have shown that alcohol abuse is associated with self-harm behaviors, mood disorders, which is associated with suicidal behaviors (Table 1). In terms of pathways, Qureshi et al. (2012) through unstructured interviews with 736 alcohol abusers over a one-year period, showed that intoxication affected neurotransmitter transmission, which in turn increased feelings of hopelessness, especially in people with poor social relationships. Besides, based on psychoanatomical interviews with 20 people who were relatives of people who committed suicides, Kizza et al. (2012) found that alcohol abusers felt they had no future and had to rely on alcohol to numb themselves, and their relatives might be better off without them. Additionally, in a retrospective analysis of 307 suicide cases (completed or attempted) from 2008 to 2012, Larkin et al. (2017) discovered that intoxication prevented people from taking action to protect themselves. Under this state, people engage in self-harm behaviors, gradually exposing them to painful experiences and allowing them to acquire the capability of suicidal behaviors.

However, different countries have different cultures when it comes to alcohol use. In countries where drunkenness is considered inappropriate, such as Bulgaria, people rarely commit suicide as a result of alcohol abuse, so the intolerant culture of drunkenness becomes a protective factor (Bräker & Soellner, 2016). Furthermore, based on empirical studies of 413 adolescents with alcohol addiction, Moore et al. (2011) found that building close relationships with the person having suicidal ideation can alleviate social isolation and was an effective protective factor in reducing alcohol abused suicide.

Table 1. Literatures about Risk Factors of Suicidal Behaviors

Risk Factors	Domain	Authors
Mental Disorder	Alzheimer's disease; Bipolar disorder; Depression; Schizophrenia	Arcelus et al. (2011); Barraclough (1998) Baxter et al. (2011); De and Peuskens (1998) Drake and Cotton (1986); Foley et al. (2008) Harris and Hawton et al. (2005); James et al. (2005) Katon et al. (2007); Kaushik et al. (2016); Lincoln et al. (2006); Nock et al. (2013); Nrugham et al. (2008); Panagioti et al. (2012) Pompili et al. (2005); Pompili et al. (2013); Sareen et al. (2005); Taiminen and Kujari (1994) Todd et al. (2013); Wolfersdorf et al. (2003);
Alcohol abuse	Alcohol abuse or addiction; Self-harm behavior; Mood disorders	Bagge and Sher (2008); Berglund and Ojehagen (1998); Conner et al. (2008); Flensborg-Madsen, et al. (2009) Gmel et al. (1998); Kaminer et al. (2006) Kingma (1994); Kizza et al. (2012) Kõlves et al. (2017); Larkin et al. (2017) Landberg (2009); Melson and O'Connor (2019) Norström and Rossow (2016); Pompili et al. (2010) Razvodovsky (2007) Razvodovsky (2009) Roerecke and Rehm (2013); Qureshi et al. (2012) Wojnar et al. (2009); Yaldizli et al (2010)
Risk Factors	Domains	Authors
Previous suicide attempts	Impulsive behavior; life events	Bachmann (2018); Björkenstam et al (2017); Clark and Fawcett (1992); Crandall et al. (2007) Conner et al. (2007); Deng and Li (2014) Diggle-Fox (2016); Fässberg et al. (2012) Gysin-Maillart et al (2016); Hazlett et al. (2016); Hettige et al. (2017); Joiner et al. (1999) Lee et al. (2017); Li et al. (2018) Lu et al. (2020); Kim (2018) Ratcliffe et al. (2008); Tan et al. (2016) Tang and Crane (2006); Oquendo et al.(2014)
Family conflict	Divorce; Parental separate; Childhood abuse	Astrup et al. (2017); Arehart-Treichel (2003). Batterham et al. (2014); Canetto and Lester (2002) Cantor and Slater (1995); Crowley (2019) Davis et al. (2009); Devries et al. (2011) Devries et al. (2013); Donath et al. (2014) Heikkinen et al. (1992); Keyvanara and Haghshenas (2010) Khezeli et al. (2018); Kõlves, et al. (2011) Kjellin and Östman (2005); MacIsaac et al. (2017) McLaughlin et al. (2012); Mandal and Zalewska (2012) Moberg et al. (2014); Wong and Mellor (2014)
Unemployment	Economic recession, job loss, debt	Agerbo (2005); Amiri (2021) Beautrais et al. (1998); Blakely et al. (2003) Chu et al. (2016); Coope et al. (2014) Cylus et al. (2014); Dalglish et al. (2015) Dos Santos, (2015); Fergusson et al. (2007) Garcy and Vågerö (2012); Kim et al. (2016) Kposowa (2001); Lundin et al. (2010) Lundin et al.(2012); Milner et al. (2013) Milner et al. (2014); Morrell (2011) Reeves et al. (2015); Walsh and Walsh (2011)

4.1.3. Previous Suicide Attempts

Previous suicide attempts were closely linked to impulsive behaviors, and life events, which would greatly predict suicidal behaviors (Table 1). There were consistent evidences that people who attempted suicide multiple times had more serious outcomes than those who have suicidal ideation (Clark & Fawcett, 1992; Rudd, Joiner, & Rajab, 1996). In terms of pathways, Oquendo, et al. (2014) conducted a 2-year prospective assessment of 415 people who had previously attempted suicide and discovered that they had experienced significant life events such as childhood abuse, sexual abuse, and that they tended to blame themselves for negative relationships with others, treating themselves as a burden to others. Conner and colleagues (2001) conducted structured interviews with 131 people who had attempted suicide and discovered the majority of them had experienced parental divorce, multiple relocations, exacerbating their feelings of homelessness. Importantly, the most serious aspect of a suicide attempt was that these people have gone through the painful experience multiple times and have developed the ability to kill themselves (Joiner et al., 1999). Previous autopsy studies have found a link between uncontrollable impulsive behaviors and learned suicidal capacity. More specifically, dysregulation of the 5-hydroxytryptophanergic system may arouse suicidal ideation which can exacerbate impulsive behaviors (Joiner et al., 2005).

However, in a systematic review of suicide attempts, Joiner et al. (1999) has discovered that writing-related activities could help these people become more aware of what is going on in the present, reduce the arousal of neurotransmitters in the central nervous system, and significantly improve self-control. As a result, writing activities can reduce impulsivity and protect people who have attempted suicide.

4.2. External factors

4.2.1. Family Conflict

Suicidal behavior is heavily influenced by family conflict due to negative interpersonal relationships and a sense of unsafety. Donath et al. (2014) conducted a year-long survey of 44610 grade 9 students and found that parental separation or divorce made children feel lonely, with significantly lower scores in the domain of belongingness and high scores in suicidal ideation. Kolves et al. (2013) conducted a case-control study over a year and a half with 228 males and 142 females and found that divorced people blame themselves for marital failure. Self-hatred made them believe others could have a better life without them, and their risk of suicidal ideation is significantly higher than the general population. In a cohort study, Astrup et al. (2017) found that parental separation caused chronic psychological pain in adolescents, leading them to choose externalized behaviors to hurt themselves, such as self-harm, which increases the risk of suicide.

However, the outcomes of family conflict were dependent on individual perceptions. According to Crowley (2019), some people who chose to end romantic relationships in a peaceful manner because they believed that ending the relationships would bring more independence and freedom for each other, thus positive autonomy moderating desperation and frustration. Hill and Pettit (2013) used questionnaires to assess 449 college students and found that positive motivation or autonomy acted as a protective factor in the face of negative interpersonal relationships, reducing the risk of suicidal behavior.

4.2.2. Unemployment

Unemployment related suicidal behavior is primarily caused by a loss of social connection and indebtedness (Table 1). Milner et al. (2014) found in a meta-analysis that people who were unemployed were the result of their own lack of life skills and inability to deal with financial problems and manage stress, leading to irrational self-hate thoughts. Similarly, Agerbo (2005) conducted a cohort study of the entire Danish population and discovered that unemployed people perceived job loss as a shame. Their dependence on friends and family for financial assistance made them feel like a burden to others. Blakely et al. (2003) used census data from 1991 to conduct a cohort study and discovered that unemployed people were easily stigmatized and isolated in their communities, increasing their psychological vulnerability and thwarted belongingness. Moreover, Walsh and Walsh (2011) conducted a simulation of suicide rates in Ireland from 1968-2009, which showed that unemployed people often used alcohol or engage in self-aggressive behavior, and after repeated acquisition and frequent exposure to physical pain, they gradually acquire the ability of suicidal behavior.

While unemployment is a significant risk factor for suicide, it also depends on the country's economic conditions and policies. Unemployment benefits and training programs in wealthy countries were protective factors for unemployed people. Cylus et al. (2014) used US Bureau of Labor data to conduct a retrospective study that found adequate unemployment benefits decreased the feeling of homelessness among the unemployed and lowered suicide rates. Moreover, training programs developed by the government for the unemployed could assist them in finding new jobs.

5. Intervention

It is possible to make targeted interventions and reduce suicidal behaviors for the above internal and external risk factors. Positive cognition or appraisal of life events is one of the most effective ways to reduce the risk of suicidal behaviors (Ram et al., 2019). Suffering from mental disorder, people with keen insight may be able to recognize the positive aspects of various treatments and improve medication compliance, allowing them to perceive themselves as less of a burden to others and more of an active collaborator (Lysaker et al., 2013). However, changing only the cognitive factor for people at high risk of suicide was ineffective; other factors such as substance abuse, family conflict and etc. should all be considered during intervention (Althaus & Hegerl, 2003).

Besides, social support is an effective intervention. Moore et al. (2011) demonstrated that increased social networks have been linked to positive emotions and improved interpersonal relationships. Specifically, shared activities, such as writing daily experiences together, can be effective in relieving impulses, which were a protective factor for people who have attempted suicide (Joiner et al., 1999). On the other hand, inappropriate social support has been proven to turn the shared writing activity into a suicide note writing process, resulting in increased suicide ideation and negative outcomes (Spirito et al., 1996).

Additionally, professional training from health care providers can also be provided to identify individuals with high risk of suicidal behaviors such as alcohol abusers (Wakai et al., 2020). Special assistance should be provided to those who are facing difficulties, such as psychological counseling services in schools for students whose parents are divorced and government-sponsored training programs for the unemployed (Joiner et al., 1999). However, such programs necessitate the long-term cooperation of health care professionals, schools, and the government, and may not be immediately effective in the short term.

6. Conclusion

This study explains the risk factors for suicide behaviors by employing interpersonal theory, analyzing the suicide pathways of the risk factors and suggesting supportive intervention measures based on previous research. However, there are still limitations in the interpersonal theory model. Specifically, its central hypothesis is that suicidal behavior only occurs when a person feels both a sense of thwarted belongingness and a sense of burdensomeness, which have been unexplored in previous studies. Furthermore, the transitional stage between suicidal desire and suicidal behavior is absent from this model, which produces research directions for future studies.

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