

Prevalence, Correlates, and Risk Factors of Suicidal Ideation and Attempts in Turkey

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ABSTRACT

Objective: An appreciation of the prevalence, correlates, and risk factors of suicidal thoughts and behaviors in Turkey may provide valuable knowledge for understanding the intersocietal variation of suicidal phenomena. In this report, we systematically reviewed the prevalence, correlates, and risk factors for suicidal thoughts and behaviors in Turkey.

Methods: Relevant publications were identified by a literature search using Google Scholar, PubMed, PsycInfo, Scopus, and Web of Science.

Results: Seventy-two studies were included. This review found evidence that variables such as poor problem-solving skills, coping strategies, hopelessness, childhood trauma, adverse life experiences, loneliness, lack of social support, family-related factors, anger, low self-esteem, attachment, substance use, and depression were associated with suicidal ideation and attempts. Despite this, reviewed studies showed incongruity in whether variables such as alexithymia, sleep quality, and obsessive symptoms were related to suicidal ideation and attempts. In addition, variables such as education, female gender, and reasons for living were only found to be associated with suicidal ideation.

Conclusion: All the studies included in this review were from Turkey; therefore, the generalizability of the findings to other cultures or geographical contexts might be limited. This review did not include gray literature and studies on suicide death. The risk and correlated factors identified in this review can be included in comprehensive suicide screening and assessment administered by clinicians in Turkey.

Keywords: Suicidal ideation, suicide attempt, Turkish population, Turkey

INTRODUCTION

Suicide is a serious global public health issue that affects all ages, genders, and societies. The statistics are all too well known at this point. World Health Organization (2020) estimates that globally 703 000 people die by suicide annually, and suicide is the fourth leading cause of death among 15-29-year-olds.¹ For 2019, the global age-standardized suicide rate was 9.0 per 100 000 population (male–female ratio: 2.3). Although there is a decline in the global age-standardized suicide rate overall, this trend is not observable in all countries. Moreover, most of the world's suicides occur in low- and middle-income countries.¹

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In Turkey, the age-standardized suicide rate for all ages (per 100 000 population in 2019 was 2.3, and crude suicide rates for all ages (per 100 000) were 3.4 (female: 0.7; male: 2.7).^{1,2} As in many other countries, in Turkey, the number of males who died by suicide is higher than that of females who died by suicide. Although crude suicide rates are smaller than those in most European countries, there has been a rapidly increasing trend in suicide rates in Turkey from the last quarter of the 20th century to the beginning of the 21st century.³ This trend indicates that suicide has become a significant public health problem in Turkey.

To tackle the global suicide problem, World Health Organization has planned a mental health action to reduce suicide rates by one-third by 2030.⁴ It is crucial to identify individuals at risk for suicide before any attempt to improve the effectiveness of these types of prevention programs.⁵ However, suicide is a complex phenomenon. The reasons behind any suicidal death, ideation, or attempt are multifaceted, and there is an etiological heterogeneity.⁶ In addition, the unpredictability of suicidal behavior with sufficient sensitivity/specificity remains a problem.^{7,8} Despite these challenges, in this difficult task, improved recognition and understanding of clinical, psychological, sociological, and biological factors might help detect those at risk and assist them in treatment selection.⁶

There is extensive literature on factors that may constitute a risk for suicidal behavior, such as a history of mental health disorders (especially mood, substance-related, anxiety, psychotic, and personality disorders), previous suicidal behaviors, thwarted belongingness, perceived burdensomeness, feelings of hopelessness, stressful life events, physical and sexual abuse, and so on.⁹⁻¹⁴ In addition, problem-solving skills, positive reasons for living, positive family relationships (especially for young people), social support, and religious faith and spirituality were identified as protective factors.¹⁵ But, to the best of the authors' knowledge, no systematic review has assimilated the findings of studies specific to Turkish individuals. The latest literature review of suicide studies in Turkey was conducted in 1997.¹⁶ However, this review was broad and descriptive and only provided a summary of the problem of suicidal behavior in Turkey.

As discussed earlier, suicide statistics vary in societies. Identifying the prevalence and correlates of and risk factors for suicidal thoughts and behaviors (STBs) in different societies and regions of the globe may shed important light on the mysteries of suicide. Suicide is explicitly and strictly forbidden by the Koran (Quran, 4:29), and suicide rates in Turkey are on the rise. An appreciation of the prevalence, correlates, and risk factors of STBs in Turkey may provide valuable knowledge for understanding the intersocietal variation of suicidal phenomena. To fill the knowledge gap, we have conducted a more recent systematic review on the prevalence, correlates, and risk factors with suicide ideation and attempts in Turkey. Results from this review may contribute to suicidology research and practice in Türkiye and elsewhere. This review will include both cross-sectional and longitudinal

studies as we aim to identify both risk factors and associated factors with suicide ideation and attempts in Turkey.

MATERIAL AND METHODS

Search Strategy

The review was conducted and reported according to the Preferred Reporting Items of Systematic Reviews and Meta-Analyses guidelines.¹⁷ Articles were identified through a systematic search of Google Scholar, PubMed, PsycInfo, Scopus, and Web of Science. The electronic search of databases was conducted in September 2021, and literature was sourced from 2005 to the present. Keyword searches using the following terms were employed in the title, abstract, and keywords field: suicide AND Turkey OR Turkish AND suicidal thoughts OR suicide ideation OR suicidal ideation AND suicide attempt OR attempted suicide. This search generated a total of 16 335 articles. The titles of all articles were screened, and the abstracts of the articles were checked regarding our inclusion criteria. When no definitive decision could be made based on the abstract, the original articles were reviewed. There is no review protocol for this study. The flow chart of the identification, screening, eligibility assessment, and inclusion of studies is presented in Figure 1.

Inclusion and Exclusion Criteria

We included studies that (i) provided data on the prevalence, correlates, and risk factors of suicide ideation and behavior, (ii) sampled participants from Turkey, and (iii) were published in Turkish or English in a peer-reviewed journal between 2005 and 2022. Suicidal thoughts and behaviors included in this study were ideation and attempts.

We excluded studies that (i) reported on completed suicide (e.g., psychological autopsy studies), (ii) reported on self-injurious behavior solely, and (iii) did not report original findings (e.g., reviews, book chapters, clinical guidelines, conference abstracts, letters, case studies, and study protocols), and (iv) used qualitative method.

Quality Assessment

The Newcastle-Ottawa scale (NOS) and its customized version for cross-sectional studies have been used to assess the methodological quality of reviewed articles.^{18,19} The tool included selection, comparability, and exposure domains for case-control studies and cohort studies and selection, comparability, and outcome domains for cross-sectional studies. A maximum of 10 (cross-sectional) and 9 (case-control studies and cohort studies) stars can be given to a study. Studies with NOS scores of 7 and above were considered high-quality studies. All studies except 1 were moderate to high quality. Details of given stars for each domain and outcome for reviewed studies were given in Table 1.

Data Extraction

Based on our inclusion criteria, first, the title of all articles was screened, and the abstract of the articles was checked. Later, the original full articles were reviewed to make a definitive decision. Each title/abstract was reviewed by only 1 reviewer (AK), and decisions made by the same reviewer regarding exclusion or moving the record to full-text screening were considered final. Studies indicated for full-text review by solo review were then independently dually reviewed by the second reviewer by utilizing the same full-text review process. Areas of disagreement were resolved by consensus. Data from the selected articles were collected through

MAIN POINTS

- Suicidal ideation (SI) and attempts (SA) are frequent events in Turkey.
- Prevalence of SI and SA vary by age and population studied.
- Several factors were identified as correlates of suicidal ideation and attempts.
- Reviewed studies were of varying quality.
- Longitudinal studies are necessary to identify risk factors.

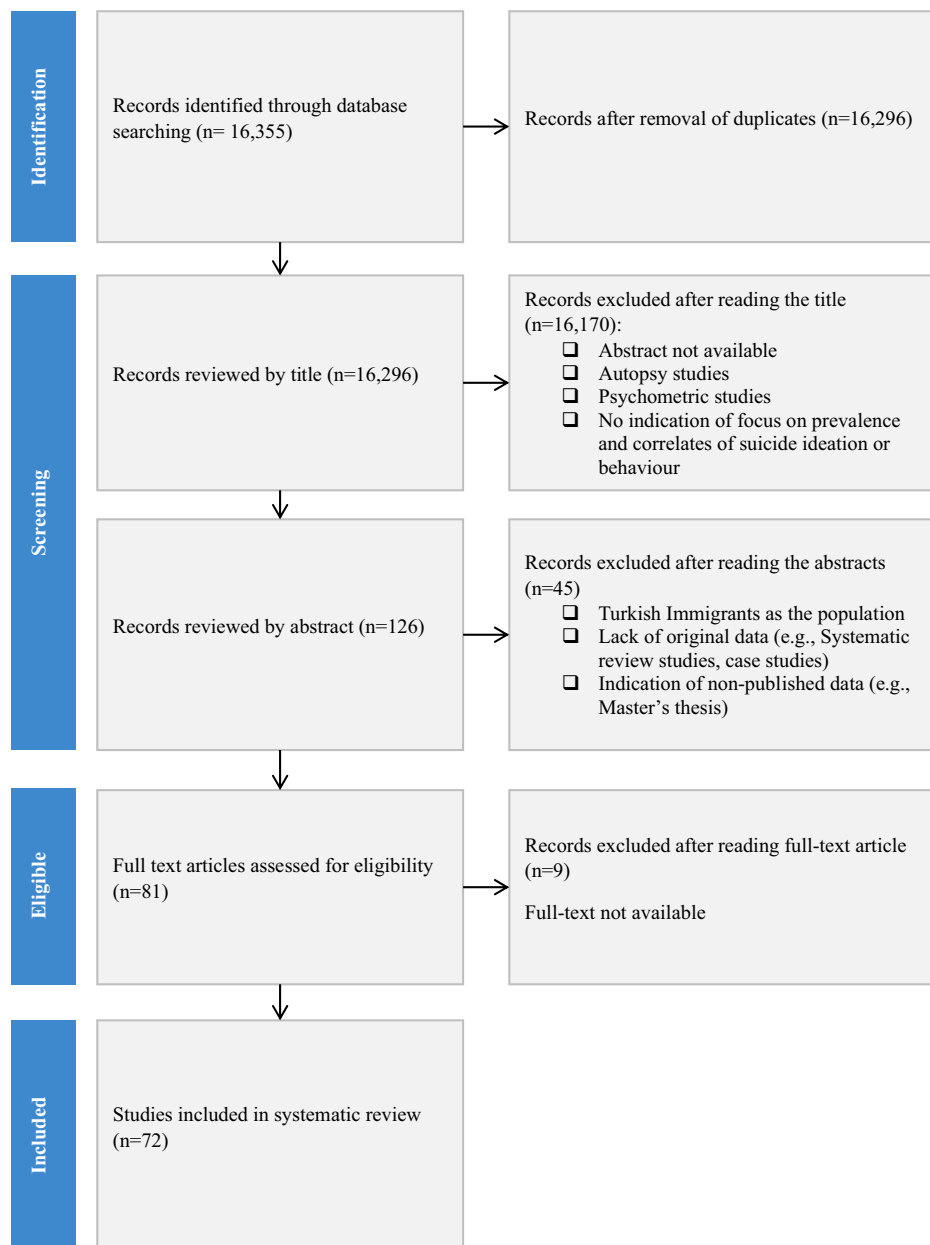


Figure 1. Summary of the article selection process.

Microsoft Excel Office, and charts and tables were generated. Lastly, we retrieved the full texts of the articles that met the criteria to perform our analysis.

Analysis and Data Synthesis

It was not possible to combine the results into a meta-analysis due to the heterogeneous study designs, measures, and features of the samples of included studies. Therefore, efforts were made to summarize and compare significant information for each study. Studies were categorized based on the sample recruited when discussing prevalence rates and based on the investigated factors when discussing correlated/risk factors of suicide.

RESULTS

The search strategy identified 16 355 papers for potential inclusion. Of these, 81 were retrieved for a detailed evaluation. Nine articles

were excluded since the full texts were not available. Thus, overall, 72 articles met the detailed eligibility criteria. Table 2 describes the 72 studies selected for the literature review, including details about the sample of the studies. Many of the studies (n=69) used a cross-sectional study design. Of these, 6 of them were cross-cultural, and 3 of them were case-control studies. Only 3 studies were longitudinal. Of these, 1 was a cohort and 1 was a case-control study.

Nineteen studies recruited adolescents, 19 recruited young adults, and 3 investigated STB in older adults. Three studies had a sample population of individuals with obsessive-compulsive disorder (OCD), 5 with schizophrenia, 5 with bipolar disorder, 1 with individuals with dissociative disorders, and 1 with personality disorders. In addition, 7 studies included participants with major depressive disorder. One study assessed suicidality in children and adolescents diagnosed with high functioning autism spectrum disorder. One study investigated suicidal behavior in patients with Parkinson's disease, and

Table 1. Newcastle–Ottawa Scores for the Included Studies

Items	Research Design	Selection	Comparability	Outcome/Exposure	Total Score	Quality
Eskin et al, 2006 ¹³	CS	**	**	**	6/10	Moderate
Aslan et al, 2017 ²⁰	CS	***	**	**	7/10	High
Kızıl et al, 2007 ²¹	CS	*	**	**	5/10	Moderate
Demirbas and Gürsel, 2012 ²²	CS	**	**	**	6/10	Moderate
Engin et al, 2009 ²³	CS	**	**	**	6/10	Moderate
Eskin, 2012 ²⁴	CS	**	**	**	6/10	Moderate
Eskin, 2013 ²⁵	CS	**	**	**	6/10	Moderate
Eskin et al, 2011 ²⁶	CS (cross-cultural)	**	**	**	6/10	Moderate
Eskin et al, 2016 ²⁷	CS (cross-cultural)	**	**	**	6/10	Moderate
Gulec-Oyeykin et al, 2017 ²⁸	CS	***	**	**	7/10	High
Toprak et al, 2011 ²⁹	CS	****	**	**	9/10	High
Eskin, 2017 ³⁰	CS	**	**	**	6/10	Moderate
Eskin et al, 2007 ³¹	CS	**	**	**	6/10	Moderate
Eskin et al, 2014 ³²	CS (cross-cultural)	**	**	**	6/10	Moderate
Foto-Özdemir et al, 2016 ³³	CS	**	**	***	7/10	High
Payci et al, 2005 ³⁴	CS	***	**	**	7/10	High
Yıldız and Solakoglu, 2019 ³⁵	CS	**	**	**	6/10	Moderate
Görgülü and Işıkhan, 2019 ³⁶	CS	***	**	**	7/10	High
Hocaoglu and Babuc, 2009 ³⁷	CS	****	**	**	8/10	High
Karakus and Tamam, 2018 ³⁸	Cohort study (PS)	**	-	-	2/9	Low
Ozdilek and Gultekin, 2014 ³⁹	CS	***	**	**	7/10	High
Öztürk and Sar, 2008 ⁴⁰	CS	***	**	**	7/10	High
Polatöz et al, 2011 ⁴¹	CS	*****	**	**	9/10	High
Sabancıoğullari et al, 2015 ⁴²	CS	***	**	**	7/10	High
Sevincok et al, 2007 ⁴³	CS	*	**	***	6/10	Moderate
Izci et al, 2015 ⁴⁴	CS	***	**	**	7/10	High
Eskin et al, 2018 ⁴⁵	CS (cross-cultural)	**	**	**	6/10	Moderate
Yıldız et al, 2018 ⁴⁶	CS	****	**	**	8/10	High
Batıgün, 2005 ⁴⁷	CS	***	**	**	7/10	High
Cenkseven Önder, 2018 ⁴⁸	CS	***	*	**	6/10	Moderate
Avcı et al, 2016 ⁴⁹	CS	***	*	**	6/10	Moderate
Karataş et al, 2018 ⁵⁰	CS	***	*	**	6/10	Moderate
Sahin et al, 2008 ⁵¹	CS	***	-	**	5/10	Moderate
Zeyrek et al, 2009 ⁵²	CS	***	**	**	7/10	High
Öksüz and Bilge, 2014 ⁵³	CS	***	**	**	7/10	High
Dilli et al, 2010 ⁵⁴	CS	****	**	**	8/10	High
Ozer et al, 2015 ⁵⁵	CS	***	**	**	7/10	High
Gençöz et al, 2007 ⁵⁶	CS (cross-cultural)	***	**	**	7/10	High
Soylu et al, 2013 ⁵⁷	CS	****	**	**	8/10	High
Bilgiç et al, 2017 ⁵⁸	CS	****	**	**	8/10	High
Altıntaş et al, 2018 ⁵⁹	CS and CC	***	**	**	7/9	High
Alpaslan et al, 2015 ⁶⁰	CS	****	**	**	8/10	High
Cenkseven Önder et al, 2019 ⁶¹	CS	****	-	**	6/10	Moderate
Özdemiroglu et al, 2017 ⁶²	CS	***	**	**	7/10	High
Muyan and Chang, 2015 ⁶³	CS	***	**	**	7/10	High
Yasan et al, 2008 ⁶⁴	PS	***	**	*	6/9	Moderate
Yagmur et al, 2010 ⁶⁵	CS	***	**	**	7/10	High

(Continued)

Table 1. Newcastle–Ottawa Scores for the Included Studies (Continued)

Items	Research Design	Selection	Comparability	Outcome/Exposure	Total Score	Quality
Adigüzel et al, 2019 ⁶⁶	CS	****	**	**	8/10	High
Ay and Erbay, 2018 ⁶⁷	CS	***	**	**	7/10	High
Erol et al, 2013 ⁶⁸	CS and CC	**	**	**	6/9	Moderate
Nazman et al, 2018 ⁶⁹	CS	***	**	**	7/10	High
Guvendeger Doksat et al, 2017 ⁷⁰	CS (cross-cultural)	***	**	**	7/10	High
Mert et al, 2015 ⁷¹	CS	*	**	**	5/10	Moderate
Kilicaslan et al, 2017 ⁷²	CS	***	**	**	7/10	High
Avci et al, 2017 ⁷³	CS	*****	**	**	9/10	High
Goktekin et al, 2018 ⁷⁴	CS	*	**	**	5/10	Moderate
Puşuroğlu et al, 2017 ⁷⁵	CS	***	**	**	7/10	High
Umut et al, 2013 ⁷⁶	CS	***	**	**	7/10	High
Arikan et al, 2019 ⁷⁷	CS	**	**	**	6/10	Moderate
Cesur et al, 2019 ⁷⁸	CS	***	**	***	8/10	High
Demir, 2018 ⁷⁹	CS	*****	**	**	9/10	High
Demirkaya et al, 2016 ⁸⁰	CS	***	**	***	8/10	High
Demirkol et al, 2019 ⁸¹	CS	****	**	**	8/10	High
Deveci et al, 2007 ⁸²	CS and CC	***	**	**	7/9	High
Dinç et al, 2018 ⁸³	CS	***	**	***	8/10	High
Emet et al, 2015 ⁸⁴	CC (follow-up study)	***	**	***	8/9	High
Izci et al, 2016 ⁸⁵	CS	*	**	**	5/10	Moderate
Ozdel et al, 2009 ⁸⁶	CS	***	**	**	7/10	High
Sarısoy et al, 2012 ⁸⁷	CS	***	**	**	7/10	High
Terzi-Unsal and Kapci, 2005 ⁸⁸	CS	****	-	**	6/10	Moderate
Yalvaç et al, 2014 ⁸⁹	CS	***	*	**	6/10	Moderate
Yazici et al, 2018 ⁹⁰	CS	*	**	**	5/10	Moderate

CC, case-control study; CS, cross-sectional study; NOS, Newcastle–Ottawa scale; PS, prospective study.

Case-control and cohort studies: Studies with NOS scores 0-3, 4-6, and 7-9 were considered as low, moderate, and high quality, respectively. Cross-sectional studies: Studies with NOS scores 0-4, 5-6, and 7-10 were considered as low, moderate, and high quality, respectively. Each asterisk represents whether individual criteria within the subsection were fulfilled.

1 examined suicidal ideation in a sample of cancer patients. Of the reviewed studies (n=29), 40% recruited outpatients, 5.5% (n=4) recruited inpatients and 6% (n=5) recruited both outpatients and inpatients.

Prevalence of Suicidal Ideation and Attempts

There are variations of scales used in measuring suicidal ideation and attempts. While most of the reviewed studies used standardized assessment tools (n=45), the rest (n=27) used unstandardized measurement tools such as sociodemographic forms, clinical interview forms, or questionnaires designed by the researchers that contain yes/no questions.

There has been limited information on suicidal thoughts among the older population in Turkey. Only 2 studies reported the prevalence of suicide ideation and attempts among this population. The suicide ideation rate among older adults in Turkey ranged from 1.5% to 30.7%, and the suicide attempt rate ranged from 4.6% to 6%.^{20,21} Suicidal ideation was strikingly high among elderly psychiatric inpatients, with a 30.7% estimate of prevalence.²⁰ Although the prevalence rate of suicidal ideation was much lower (1.5%) in depressed elderly patients, 39% reported that they wished to die.²¹

The prevalence of suicidal ideation among young adults in Turkey varied from 2.5% to 42.5%, and suicide attempts ranged from 2.2% to 11.5%.²²⁻²⁹ The prevalence of suicidal ideation among adolescents

is reportedly higher than in young adults. The prevalence of suicidal ideation among Turkish adolescents varied between 22.4% and 36.1%, and suicide attempts ranged from 2.5% to 28.3%.^{25,30-35} In a study with both high school and university students, high school students reported 36.1% lifetime suicide ideation, which was higher than their university student counterparts.³⁰

The prevalence of suicidal ideation rate among the working-age population (18-65 years) varied between 0.62% and 81.8%.^{13,36-43} Individuals with psychiatric disorders exhibited higher rates of suicidal ideation compared to those with no mental disorders. Similarly, individuals with psychiatric disorders showed higher rates of suicide attempts compared to those with no mental disorders, ranging from 12% among patients diagnosed with OCD to 67.6% among depressed patients with alexithymia.^{38,44}

Correlated Factors for Suicidal Ideation and Attempts

Correlated factors that appeared in more than 1 of the included studies are described later by type of variables.

Sociodemographic Factors

Gender. All studies evaluating the gender ratio for suicidal ideation and attempts reported that suicidal thoughts were more common in Turkish females than males.^{21,23,30,31,34,45} However, studies evaluating gender ratio for suicide attempts yield inconsistent findings. For example, 1 study reported more suicide attempts by males than

Table 2. Summary of Included Studies

Author, Year	Sample Information	Research Design	Key Findings
Eskin et al, 2006 ¹³	N = 121 psychiatry outpatients (69 women, 53 men) Age range = 17-63 (M = 36.3, SD = 11.9)	CS	<ul style="list-style-type: none"> SI: 43.2%; SA: 28.7% Poor problem-solving was an independent predictor of both SI and SA. Individuals with insufficient problem-solving ability who experienced a high number of traumatic life events had a higher percentage of SI than other groups.
Aslan et al, 2017 ²⁰	N = 150 Female: 72.7% Age = 65 and over (M = 71.3 SD = 5.6)	CS	<ul style="list-style-type: none"> SI: 30.7%; SA: 6% Patients with SI had a lower level of education compared to the rest of the patients
Kızıl et al, 2007 ²¹	N = 130 elderly patients [101 females (77.7%)] with MDD Mean age (wished to die) = 72.08 ± 5.75 Mean age (not wished to die) = 71.02 ± 6.23 t = -0.97	CS	<ul style="list-style-type: none"> SAs were low among the elderly with MDD. 39% of patients reported: "wish to die." SA: 4.6%, SI: 1.5% Those who wished to die were mainly women, had less education, and were more repressed. Only the severity of depression predicted the presence of a wish to die.
Demirbas and Gürsel, 2012 ²²	N = 647 university students Female = 83.6% Age range = 18-34 (M = 21.4, SD = 1.8)	CS	<ul style="list-style-type: none"> SI: 13.9%, suicide plan: 2.2%, SA: 2.2% University students with suicidal behavior had a higher level of trait anger, suppressed anger, and expressed anger to the outside and lower levels of anger control than university students with no suicidal behavior. A high level of trait anger and low academic achievement were 2 important predictors of suicidal behavior.
Engin et al, 2009 ²³	N = 1992 university students Females: 75.8% Age range = 15-24 (M = 20.02, SD = 1.54)	CS	<ul style="list-style-type: none"> SI: 2.4%; SA: 11.2% Females had more SI than males. Correlated factors with suicidal thoughts among young Turkish adults: gender, school problems, family relationships, anger expression, somatization, hostility, psychotic symptoms, phobic anxiety, anxiety disorder, and interpersonal sensitivity.
Eskin, 2012 ²⁴	N = 1203 university students (696 females) Age range = 17-32 (M = 20.9, SD = 2.4)	CS	<ul style="list-style-type: none"> SI: 42.5%; SA: 11.5% Self-esteem: associated with SI in both men and women, associated with SA only in women. Childhood gender nonconformity: independent predictor of SI in both sexes. Low attachment to mother: a significant predictor of SI and SA in females. Low attachment to father: a significant predictor of SI and SA in males.
Eskin, 2013 ²⁵	N = 867 [541 high school students (HSS), 326 university students (US)] Female (US): 41.4% Female (HSS): 65% Age range = 14-29 Mean age (HSS) = 16.52 ± 1.09 Mean age (US) = 20.40 ± 1.9	CS	<ul style="list-style-type: none"> High school students: lifetime SI: 31.8%, past 12 months SI: 19.8%, current SI: 7.4%, lifetime + past 12 months + current SI: 33.8%, lifetime SA: 11.8%, past 12 months SA: 6.7% University students: lifetime SI: 25.9%, past 12 months SI: 12%, current SI: 3.7%, lifetime + past 12 months + current SI: 33.8%, lifetime SA: 5.8, past 12 months SA: 2.1% Participants classified as individualistic had significantly more frequent suicidal ideation and attempts than those classified as collectivistic. Suicidal ideation and attempts were more common among adolescents than young adults.
Eskin et al, 2011 ²⁶	N = 646 (320 Austrian medical students, 158 females and 162 males; 326 Turkish medical students, 135 females, 191 males) Mean age (Austrian sample): 22.4 (SD = 3.5) Mean age (Turkish sample): 20.4 (SD = 1.9)	CS (cross-cultural)	<ul style="list-style-type: none"> More Austrian (37.8%) than Turkish (27.3%) students reported lifetime, past 12 months, or current SI. More Turkish (6.4%) than Austrian (2.2%) students reported lifetime or past 12-month suicide attempts.
Eskin et al, 2016 ²⁷	N = 5572 participants (mean age = 22.1, SD = 3.5) Female: 55%	CS (cross-cultural)	<ul style="list-style-type: none"> Lifetime SI: 27.4% (24.2% for Turkey), 12 months SI: 11.7% (8.8% for Turkey), Current SI: 4.8% (3.3% for Turkey) Lifetime SA: 6% (8.6% for Turkey), 12 months SA: 3.3% (2.2% for Turkey) Turkish students reported lower rates of SI but higher rates of SA and psychological distress. In the whole sample, more male students than female students reported having suicidal ideation. A similar percentage of female and male suicide attempts were reported.
Gulec-Oyeckin et al, 2017 ²⁸	N = 4430 participants (students) Female: 53% Mean age = 21.8, SD = 3.7	CS	<ul style="list-style-type: none"> Lifetime SI: 15.1% Hopelessness was a strong indicator of suicidal thoughts among Turkish university students.

(Continued)

Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Toprak et al, 2011 ²⁹	N = 636 participants (undergraduate students) Female: 54% Age range: 16-22 Mean age (male) = 19.5 ± 0.7 Mean age (female) = 19.2 ± 0.9	CS	<ul style="list-style-type: none"> Lifetime SI: 11.4%; SA: 7.1% Tranquilizer abuse was related to SI and used as a means of a suicide attempt. Adolescents who abused drugs and practiced self-harm presented the highest suicide risk.
Eskin, 2017 ³⁰	N = 3031 (1630 high school, 1401 university students) Mean age (high school group): 16.02 (SD = 1.07) Mean age (university group): 20.76 (SD = 1.88)	CS	<ul style="list-style-type: none"> SI: 32.8% (36.1% for high school and 29% for university students); SA: 8.4% (9.4% for high school and 7.2% for university students) More men than women reported considering suicide and making suicide attempts. Higher suicidal attempts among high school students compared to university students.
Eskin et al, 2007 ³¹	N = 805 first-year high school students (367 girls, 438 boys) Age range = 13-18 (M = 14.8, SD = 0.7)	CS	<ul style="list-style-type: none"> Past 12 months or lifetime SI: 23%. Lifetime SA: 2.5%. Girls had higher past 12 months or lifetime SI than boys, but suicidal attempts were equally common in girls and boys. Girls scored significantly higher on depression and the Suicide Probability Scale (SPS) and on assertiveness and perceived social support from friends than boys. Depression and low self-esteem were the most consistent and independent predictors of suicidal thoughts, attempts, and SPS scores in both sexes. Self-appraised problem-solving was an independent predictor of suicide risk scores in boys only.
Eskin et al, 2014 ³²	N = 964 participants (high school students) Age range: 15-20 (M = 17.64; SD = 0.95), Female: 53% (Turkish: 36%, Slovak: 16%)	CS (Cross-Cultural)	<ul style="list-style-type: none"> Slovak and Turkish high school students reported similar percentages (Slovak = 36.4%; Turkish = 33.8%) of a lifetime, past 12 months, or current SI. Turkish students had significantly higher lifetime or past 12-month suicide attempts (12.2%) than Slovak students (4.8%).
Foto-Özdemir et al, 2016 ³³	N = 64 participants (adolescents) Female: 61% Age range: 12-17 (M = 14.8, SD = 1.4)	CS	<ul style="list-style-type: none"> Recurrent suicidal thoughts: 29.6%; SA: 17.2% Adolescents with an NSSI behavior before the suicide attempt had higher emotion-focused coping subscale scores than adolescents without an NSSI behavior. Adolescents with recurrent suicidal thoughts before the suicide attempt had higher scores in the "turning against self" subscale than adolescents without recurrent suicidal thoughts. The difference between the 2 groups was significant.
Payci et al, 2005 ³⁴	N = 2352 (2224 participated) high school students (50.1% males; 49.9% females) Mean age (female control) = 26.24 ± 6.61 Mean age (female suicide) = 25.12 ± 11.93 Mean age (male control) = 26.82 ± 6.95 Mean age (male suicide) = 27.57 ± 10.88	CS	<ul style="list-style-type: none"> 22.4% had suicidal thoughts, 14.1% planned to commit suicide, and 6.2% attempted suicide. Females compared to males had significantly higher rates of desperation, suicidal thoughts, plans, attempts, and the mean number of attempts.
Yıldız and Solakoglu, 2019 ³⁵	N = 2066 participants (students) Female: 50.3% Age range: 13-17 (M = 14.35, SD = 0.67)	CS	<ul style="list-style-type: none"> Lifetime SI: 25% and SA: 10% Parental strain, school strain, economic strain, negative life events strain, and physical victimization strain were associated with both suicidal ideation and attempts. Peer strain was only associated with suicidal attempts. Except for peer strain, all strains significantly predicted SI. Depression and anger partially mediated the effect of strains on suicide attempts.
Görgülü and Işıkhhan, 2019 ³⁶	N = 403 participants (male) Age range: 18-65, (M = 30, SD = NA)	CS	<ul style="list-style-type: none"> Suicidal thoughts: 26.9%; SA: 20.5% Related factors with suicidality: being single, low income, criminal behavior at an early age, substance use behavior, multiple drug use. Best predictive variables of suicide risk: neuroticism and psychoticism, family members' interest in each other.
Hocaoglu and Babuc, 2009 ³⁷	N = 120 patients with schizophrenia Age range: 18-65 years. Divided into 2 groups: SI (+), patients having suicide ideation; SI (-), patients not having suicidal ideation. Mean age [SI (+)]: 39.3 (SD = 12.57); mean age [SI (-)]: 36.5 (SD = 9.67).	CS	<ul style="list-style-type: none"> 31.66% of schizophrenic patients had SI, and 18% had SA. Patients with suicidal ideation reported fewer reasons for living than those who did not have suicidal ideation.

(Continued)

Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Karakus and Tamam, 2018 ³⁸	N = 50 patients with OCD (31 female, 19 male) and N = 40 control group (24 female, 16 male). Mean age (patient): 35 (SD = 11.51) Mean age (control): NA	Cohort study (PS)	<ul style="list-style-type: none"> In OCD patients: 12% had lifelong suicide attempts, and 40% had lifelong SI. OCD patients had higher scores in total suicide behavior, past SI, current SI, and suicide probability compared to healthy controls. There is a significant correlation between past SI and sleep latency and use of sleep medication; past SAs and sleep medication in OCD patients.
Ozdilek and Gultekin, 2014 ³⁹	N = 120 patients with Parkinson's disease Female: 35% Mean age: 61.6 (SD = 9.1)	CS	<ul style="list-style-type: none"> Lifetime SI: 11.6% and none of the patients reported any suicide attempts. Duration of disease, disability in activities of daily living, motor signs, dyskinesia, motor fluctuations, and levodopa equivalent daily dose was significantly associated with SI. Education level, disease duration, age of PD onset, presence of depression, and presence of impulse-control disorder behaviors were significantly associated with SI.
Öztürk and Sar, 2008 ⁴⁰	N = 40 participants Female: 78% Age range: 16-40 (M = 25.8, SD = 6.2)	CS	<ul style="list-style-type: none"> SI: 37.5%, SA: 57.5% Suicidal patients had elevated scores for childhood emotional abuse, physical abuse, and emotional neglect and had concurrent somatization disorder more frequently than the remaining patients. Childhood physical neglect did not differ between the suicidal and non-suicidal groups. Concurrent somatization disorder diagnosis was the only predictor of SI after controlling for childhood trauma scores and borderline personality disorder diagnosis.
Polatöz et al, 2011 ⁴¹	N = 1117 participants Female: 55% Age range: 18-65 (M = 37.13, SD = 13.02),	CS	<ul style="list-style-type: none"> Lifetime suicide behavior was 2.23%, lifetime suicide planning or an attempt was 3.58%, SI for the last 1 year was 1.43%, lifetime SA was 1.43%, and lifetime suicide intention was 0.62%. Suicidal behaviors were more frequent in involuntary marriages than in voluntary ones. When marriage duration was increasing, both suicide behavior and suicide ideations were decreasing significantly. The rate of SI was significantly higher for individuals with alcohol abuse history than the ones without.
Sabancioğullari et al, 2015 ⁴²	N = 155 psychiatric inpatients Female: 51% Mean age = 38.61 ± 12.17	CS	<ul style="list-style-type: none"> Past SI: 55.5%, current SI: 11.6%, previous SA: 31% Sociodemographic variables did not affect the suicide probability scores. Patients who had depression, previous and current SI, and previous SAs had a higher suicide probability.
Sevincok et al, 2007 ⁴³	N = 57 schizophrenia patients (OCD = 24, non OCD = 33) Female: 46% Mean age (OCD): 34.2 (SD = 9.6) Mean age (non-OCD): 38.0 (SD = 12.4)	CS	<ul style="list-style-type: none"> Previous SI: 79.2, current SI: 62.5; SA: 50% of OCD patients Previous SI: 48.5; current SI: 81.8%; SA: 21.2% of non-OCD patients Patients with a history of previous SAs were more likely to have a comorbid diagnosis of OCD. Compulsive symptoms significantly predicted SAs.
Izci et al, 2015 ⁴⁴	N = 99 patients with major depression Female: 40% Mean age (patient) = 41.44 ± 12.60 Mean age (control) = 38.12 ± 7.94	CS	<ul style="list-style-type: none"> Major depressive patients with alexithymia reported more suicide attempts (67.6%) than major depressive patients without alexithymia (29.2%). Alexithymic patients compared to non-alexithymic patients had higher scores of SI and hopelessness. A significant association between difficulty identifying feelings, difficulty expressing feelings, and SI was found.
Eskin et al, 2018 ⁴⁵	N = 8417 participants (university students) Female: (54%) Age range: 17-45 (M = 21.28, SD = 3.10)	CS (cross-cultural)	<ul style="list-style-type: none"> SI: 22%, SA: 8.6% Turkish students rated their suicidal thoughts as the most serious. Turkish students reported the most recent attempts. Turkish attempters expressed the intense desire to die at most. The odds of suicidal thoughts were significantly larger for Turkish female students than for Turkish male students. Suicidal thoughts and attempts were more common in females than males in the whole sample.
Yıldız et al, 2018 ⁴⁶	N = 2035 participants (high school students) Female: 50% Age range: 13-17 (M = 14.35, SD = 0.67)	CS	<ul style="list-style-type: none"> Being female was significantly associated with a higher risk of suicide attempts. Exposure to suicide had a statistically significant positive effect on adolescents' suicide attempts, and it contributed to higher attempt risk for only girls but not for boys.
Batıgün, 2005 ⁴⁷	N = 683 adolescents and adults (430 female: 63%) Age range = 15-65 (M = 27.48, SD = 11.06)	CS	<ul style="list-style-type: none"> Hopelessness, loneliness, reasons for living, education, and age are significant predictors of suicide probability.

(Continued)

Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Cenkseven Önder, 2018 ⁴⁸	N = 445 high school students [227 girls (51%), 218 boys (49%)] Age range = 14-18 (M = 15.90, SD = 0.87) Mean age for female students = 15.82 (SD = 0.85); Mean age for male students = 15.95 (SD = 0.91)	CS	<ul style="list-style-type: none"> Helpless and optimistic coping styles predicted both female and male adolescents' suicide. Seeking social support only predicted male adolescents' suicide. Female adolescents compared to male adolescents reported being more perceived social support from friends and significant others. A low level of perceived social support from family predicted the suicide probability of both sexes.
Avci et al, 2016 ⁴⁹	N = 470 inpatients Female: 52.8% Mean age: 47.14 (SD = 17.58)	CS	<ul style="list-style-type: none"> SI: 8.5%; SA: 3.4% Individuals with psychological symptoms and who used maladaptive coping ways scored higher in suicide probability. Helpless and submissive coping styles increased suicide probability, and optimistic and social support-seeking styles decreased suicide probability.
Karataş et al, 2018 ⁵⁰	N = 235 university students Females: 66.3% Mean age: 20.80	CS	<ul style="list-style-type: none"> Problem-solving style negatively, and avoidance style positively predicted suicide probability. Seeking social support style did not appear to be a significant predictor of suicide probability. Anger inwards and anger outwards dimensions of anger predicted suicide probability.
Sahin et al, 2008 ⁵¹	N = 792 civil servants Female: 0% Age range: 20-33 (M = 21.6, SD = 2.03)	CS	<ul style="list-style-type: none"> Individuals who had high scores in both anger and impulsivity with a lack of problem-solving abilities had higher scores in suicide probability.
Zeyrek et al, 2009 ⁵²	N = 180 participants (university students) Female: 61% Age range: 17-26 (M = 20.3, SD = 1.6),	CS	<ul style="list-style-type: none"> Hopelessness and problem-solving skill variables predicted suicidality. The association between hopelessness and suicide probability scores was significantly stronger. Attachment styles predicted suicidality only for women.
Öksüz and Bilge, 2014 ⁵³	N = 641 Turkish students Female: 60% Age range: 18-28 (M = NA, SD = NA)	CS	<ul style="list-style-type: none"> Negative orientation to the problems and vengeful reactions (a component of interpersonal anger) were the best predictors of the suicide probability of young adults.
Dilli et al, 2010 ⁵⁴	N = 214 (116 suicide attempt group, 98 control group) Female: 82.7% Age range = 11-16 (mean age for suicidal attempt group = 13.8 ± 1.1; for control group = 13.7 ± 1.2)	CS	<ul style="list-style-type: none"> Low problem-solving skills were positively correlated with the total score of the Suicide Probability Scale. Reasons for the living score were negatively correlated with the total score of the Suicide Probability Scale. Neither low problem-solving skills nor reasons for living scores did not significantly predict suicide probability. Higher suicidal probability scores among adolescents were only associated with previous suicide attempts.
Ozer et al, 2015 ⁵⁵	N = 122 (62 patients with MDD, 60 healthy control) Female: over 80% for each group Age range: 18-65 (M = NA, SD = NA)	CS	<ul style="list-style-type: none"> SA: 50% of depressed patients Patients with and without suicide attempts had similar anxiety and avoidance scores. Patients with a fearful attachment style had more suicide attempt rates than other groups.
Gençöz et al, 2007 ⁵⁶	N = 749 participants (Turkish and American undergraduate students) Mean age (Turkish): 20.8, SD = 1.6 Mean age (American): 21.2, SD = 4.0	CS (cross-cultural)	<ul style="list-style-type: none"> Hopelessness was associated with suicidal ideation, and hopelessness scores successfully predicted SI in both samples
Soylu et al, 2013 ⁵⁷	N = 63 participants, SD = NA) Female: 76% Age range: 12 to 18 Mean age = 16.01 ± 1.31)	CS	<ul style="list-style-type: none"> Factors associated with SI: high level of hopelessness, depression and anxiety level, and low self-esteem. Factors associated with SAs: separated family background, lower perceived family support, and high rates of conduct difficulties.
Bilgiç et al, 2017 ⁵⁸	N = 101 outpatient adolescents with MDD Female: 75.2% Age range = 12-18 (M = 15.4, SD = 1.2)	CS	<ul style="list-style-type: none"> SA: 28.3% Fear of loss of cognitive control positively affected SI mediated by the severity of depression. Fear of externally observable anxiety symptoms and anxiety-related bodily sensations did not indicate any relationship with SI among adolescents. Positive relationships between hopelessness and SI, and the presence of anxiety disorders and SA history.
Altıntaş et al, 2018 ⁵⁹	N = 164; 57 with social anxiety disorder, 58 with panic disorder, and 49 healthy controls Age range: 18-56 Mean age (social anxiety disorder) = 24.7 ± 7.5 Mean age (healthy controls) = 28.1 ± 6.6 Mean age (panic disorder) = 32.8 ± 8.5	CS and CC	<ul style="list-style-type: none"> SI: 48.2% for SAD patients; 33.9% for PD patients; 0% for healthy control. SA: 7.1% for SAD patients; 3.6% for PD patients; 0% for HC. Alexithymia scores of SAD patients only predicted SI scores indirectly through their effects on trait anxiety and subjective depressive symptoms.

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Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Alpaslan et al, 2015 ⁶⁰	N = 381 female high school students Age range: 14-19 (M = 16.07, SD = 1)	CS	<ul style="list-style-type: none"> SPS score, hopelessness, suicide ideation, and hostility subscales scores of SPS were significantly higher in the alexithymic DEAs than the non-alexithymic DEAs group.
Cenkseven Önder et al, 2019 ⁶¹	N = 426 high school students Female: 50.2% Age range = 14-18 (M = 15.89, SD = 0.85)	CS	<ul style="list-style-type: none"> Positive correlation between trait anger, anger-in, anger-out, and suicide probability, and a negative correlation between anger control and suicide probability. Self-esteem was negatively correlated with suicide probability. All anger variables except anger control and self-esteem significantly predicted the suicide probability of adolescents.
Özdemiroglu et al, 2017 ⁶²	N = 117 adult cancer patients Female: 58.7% Age range: 18-79 (M = 49.9)	CS	<ul style="list-style-type: none"> SA: 4.3% The previous history of psychiatric disorder and pain significantly predicted current SI. Self-esteem was significantly correlated with current SI, depression, anxiety, hopelessness, and pain.
Muyan and Chang, 2015 ⁶³	N = 288 (170 females and 118 males) Turkish college students Age range: 18-40 (M = 21.33, SD = 1.98)	CS	<ul style="list-style-type: none"> Among perfectionism variables, only doubts about actions and parental criticism significantly predicted suicide ideation. Loneliness was a significant predictor of SI and added a small but significant 5% unique variance in SI. When depressive symptoms were controlled, parental criticism among perfectionism dimensions was the only significant predictor of SI.
Yasan et al, 2008 ⁶⁴	N = 96 participants (suicide attempters) Female: 66% Age range: 15-24 (M = 23.01, SD = 7.96),	PS	<ul style="list-style-type: none"> Unfavorable family attitudes, religious householder, the difference in the level of the devotion to religion between the householder and the subject, lack of any support system, family violence after the SA, the persistence of unfavorable events were higher in patients with repeated SAs and SI.
Yagmur et al, 2010 ⁶⁵	N = 1120 participants (suicide attempters) Female: 81% Age range: 15-50+	CS	<ul style="list-style-type: none"> Family problems were the most common cause of suicide attempts. Family history of psychiatric disorders and the presence of previous psychiatric disorders were the most important risk factors for suicidal ideation.
Adigüzel et al, 2019 ⁶⁶	N = 112 outpatients with bipolar disorder in remission Female: 58% Age range: 19-65	CS	<ul style="list-style-type: none"> SA: 48.9% A statistically significant and positive correlation between childhood trauma, aggression, and suicide probability was found.
Ay and Erbay, 2018 ⁶⁷	N = 67 patients diagnosed with OCD Age range = 18-65 Mean age (CTQ < 35) = 28.51 ± 9.33 Mean age (CTQ ≥ 35) = 31.63 ± 8.82	CS	<ul style="list-style-type: none"> SA: 2% for CTQ ≥ 35) group; 0% for CTQ < 35 group Mild correlation between childhood trauma and suicide probability (independently of depression and anxiety).
Erol et al, 2013 ⁶⁸	N = 90 (30 patients with MDD in full remission with a history of suicide attempt (MDD+), 30 patients with MDD in full remission with no history of suicide attempt (MDD-), and 30 healthy controls (HC) Age range = 18-65 Mean age for MDD+ = 34.3 ± 8.5 Mean age for MDD- = 35.2 ± 8.5 Mean age for HC = 34.2 ± 8.4	CS and CC	<ul style="list-style-type: none"> Patients with MDD who had attempted suicide reported significantly higher CTQ Childhood Trauma Questionnaire (CTQ) than patients who had never attempted suicide. There was no significant difference between patients who had never attempted suicide and healthy controls in any CTQ subdomains.
Nazman et al, 2018 ⁶⁹	N = 6747 adolescents Female: 50% Age range: 12-18 (M = NA, SD = NA)	CS	<ul style="list-style-type: none"> Relationship between SI and cigarette and alcohol use, drug addiction, being exposed to violence and sexual abuse, being mocked, and family structure.
Guvendeger Doksat et al, 2017 ⁷⁰	N = 2518 children and adolescents. Divided into 3 groups: HAS (-), no history of suicide; HAS (History of attempted suicide) (+), history of suicide attempts; NSSI (-), no history of suicide; NSSI (Non-suicidal self-injury) (+), history of non-suicidal self-injury. Mean age [HAS (-)]: 16.15 (SD = 1.4); mean age [HAS (+)]: 15.96 (SD = 1.3); mean age [NSSI (-)]: 16.14 (SD = 1.4); mean age: [NSSI (+)] = 16.09 (SD = 1.3). Female (NSSI): 30%; female (HAS): 44%	CS (cross-cultural)	<ul style="list-style-type: none"> SA: 21% of the total sample. Physical and sexual abuse increased the risk of SAs. Parental separation/divorce and parental mental disorders were significant predictors of SI. Using cannabis and cocaine was a risk factor for a history of SAs, and polysubstance use was associated with both an account of SAs and non-suicidal self-injurious behaviors.

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Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Mert et al, 2015 ⁷¹	N = 91 patients with bipolar disorder type I Female: 44 % Mean age: 38.3 (SD = 11.7)	CS	<ul style="list-style-type: none"> SA: 33% Childhood emotional neglect and the number of depressive episodes were found to be significant predictors of suicide attempts in patients with bipolar disorder type I.
Kilicaslan et al, 2017 ⁷²	N = 199 patients with schizophrenia Female: 31.66% Mean age: 40.42 (SD = 11.20)	CS	<ul style="list-style-type: none"> No association between suicidality and both childhood trauma and sleep were found.
Avci et al, 2017 ⁷³	N = 459 hospitalized elderly. Female: 53.4% Age range = 65 and older (M = 70.10, SD = 6.81)	CS	<ul style="list-style-type: none"> High suicide risk: 24.0% Suicide risk is higher: 60-74 age group, living alone, drinking alcohol, perceiving their religious beliefs as weak, being treated for cancer, having a diagnosis of 11 years or over, having a history of admission to a psychiatry clinic, and being at risk for anxiety and depression.
Goktekin et al, 2018 ⁷⁴	N = 144 participants (patients) Females: 67% Age range: 18-74, (M = 28.03, SD = 9.9)	CS	<ul style="list-style-type: none"> Using alcohol and smoking cigarettes increased the recurrent suicide risk.
Puşuroğlu et al, 2017 ⁷⁵	N = 200 participants (100 patients + 100 controls) Female: 60% Age range (patients): 18-65 (patients mean age = 36.77, SD = 12.70), (controls mean age = 38.12, SD = 12.42)	CS	<ul style="list-style-type: none"> No relationship between suicidal ideation and obsessive beliefs in patients with depressive disorder.
Umut et al, 2013 ⁷⁶	N = 104 participants (randomly selected inpatients), female: 31% Age range: 20-65 Mean age (w/history of suicide attempt) = 38.20 Mean age (with/history of suicide attempt) = 38.30	CS	<ul style="list-style-type: none"> Depression and negative symptom severity determined SI, and self-destructive behaviors determined SAs among schizophrenic patients.
Arikan et al, 2019 ⁷⁷	N = 533 (276 female 257 male); 218 non-suicidal, 211 with suicide ideation, 74 with a suicide attempt, and 30 healthy controls Mean age (non-suicidal) = 38.42 Mean age (suicide ideation) = 35.06 Mean age (suicide attempt) = 31.36; mean age (healthy controls) = 43.90	CS	<ul style="list-style-type: none"> High-gamma power at F4, Fz, F8, C4, Cz, O2, T5, and T6 was greater in depressed patients with previous suicide attempts than in non-suicidal depressed patients. Depressed patients with previous suicide attempts had higher gamma power at Fz, Cz, and F8 than depressed patients with current suicidal ideation.
Cesur et al, 2019 ⁷⁸	N = 231 (86 healthy controls and 145 bipolar I patients) Age range = 18-65	CS	<ul style="list-style-type: none"> Bipolar I patients with a history of suicide attempts had higher scores in the inability to control worrying and negative beliefs about the uncontrollability of worrying.
Demir, 2018 ⁷⁹	N = 350 psychiatry outpatients (228 female: 65.14%) Age range = 18 and older	CS	<ul style="list-style-type: none"> History of SA: 25.7% The probability of suicide increased as the level of expressed emotion increased (patient-directed excessive interventionism, excessive reactivity, negative attitudes toward a disorder, intolerance, and high expectations).
Demirkaya et al, 2016 ⁸⁰	N = 55 (6 girls, 49 boys) with the diagnosis of ASD Age range = 7-20 Mean age for suicidal group (n = 16) = 13.4 ± 2.0 Mean age for non-suicidal group (n = 39) = 13.7 ± 3.2	CS	<ul style="list-style-type: none"> SI: 37.5 ; SA: 12.7% Verbal suicidal declarations: 18.7% Adolescents with ASD who had psychotic features and a family history of suicidal behaviors and completed suicide showed more suicidality than the non-suicidal group.
Demirkol et al, 2019 ⁸¹	N = 130 (67 outpatients (43 females, 24 males) diagnosed with OCD without any comorbid psychiatric diagnosis and 63 healthy controls (33 females, 30 males) Age range = 18 and older Mean age for OCD group = 36.1 ± 11.7 Mean age for control group = 33.2 ± 13.3	CS	<ul style="list-style-type: none"> Lifetime SA in OCD patients: 17.9% Moderately significant relationships in the same direction between the psychache, SI, and types and severity of the obsessive-compulsive symptoms were found. Only psychache predicted previous suicide attempts significantly.
Deveci et al, 2007 ⁸²	N = 59 Females: 70.8% Mean age for suicide group = 21.8 ± 8.8 Mean age for MDD group = 33.9 ± 15.7 Mean age for control group = 31.4 ± 5.9	CS and CC	<ul style="list-style-type: none"> Mean serum BDNF (Brain-derived neurotrophic factor) levels were significantly lower in the suicide and MDD group than in the control groups.

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Table 2. Summary of Included Studies (Continued)

Author, Year	Sample Information	Research Design	Key Findings
Dinç et al, 2018 ⁸³	N = 31 adolescents with a history of suicide attempts Females: 87.1% Age range = 12-18 Mean age for adolescents = 15.3 ± 1.2; for mothers = 39.2 ± 5.4)	CS	<ul style="list-style-type: none"> Adolescents whose mothers had psychopathology had higher SI scores than adolescents whose mothers did not have psychopathology. No relationship was found between the presence of psychopathology in the mother and suicidal behavior. Having a dysfunctional family increased adolescents' suicidal ideation.
Emet et al, 2015 ⁸⁴	N = 358 participants (115 suicide attempters, 243 controls) Mean age (suicide) = 25.12 ± 11.93 Mean age (control) = 26.24 ± 6.61	CC (follow-up study)	<ul style="list-style-type: none"> Higher FT4, TSH, and lower FT3/FT4 levels were independently associated with suicide attempts; however, none of the thyroid hormones indicated future suicide attempts in the follow-up period.
Izci et al, 2016 ⁸⁵	N = 151 (101 bipolar patients and 50 control group subjects) Female (control): 40% Female (patient): 30% Mean age (patient group): 35.69 (SD = 12.10) Mean age (control): 32.00 (SD = 9.24).	CS	<ul style="list-style-type: none"> 37.62% of the patients with bipolar had a suicide attempt.
Ozdel et al, 2009 ⁸⁶	N = 144 suicide attempters (108 females; 36 males) Mean age (females) = 24.60 ± 9.53 Mean age (males) = 28.19 ± 10.40	CS	<ul style="list-style-type: none"> Conflict within the family was the most frequent psychological stress factor. Most of the suicide attempters met DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, fourth edition) criteria for at least 1 psychiatric diagnosis (mainly for MDD). Suicide attempters with depression tended to be immigrant, urban dwellers with high scores on the Beck's Suicidal Intention Scale (BSIS) scale.
Sarısoy et al, 2012 ⁸⁷	N = 222 participants (119 bipolar disorder patients, 103 healthy controls) Female: 71% Mean age (patients): 38.18 (SD = 13.00) Mean age (controls): 36.84 (SD = 11.65)	CS	<ul style="list-style-type: none"> SA: 25.2% of bipolar patients Positive correlation between current SI scale scores and history of suicide attempts.
Terzi-Unsal and Kapci, 2005 ⁸⁸	N = 605 participants (adolescents from 5 different high schools) Female: 31% Mean age: 17 (SD = 1.5)	CS	<ul style="list-style-type: none"> Adverse life events, psychosocial variables, social support, and self-image were secondary risk factors for adolescent suicides. These secondary risk factors predicted self-worth, psychological health, and hopelessness. These variables, in turn, predicted suicide ideation—which was identified as a primary risk factor—that predicted suicide behaviors.
Yalvaç et al, 2014 ⁸⁹	N = 50 participants (suicide attempt patients) Female: 64% Mean age (female) = 25.9 ± 7.6 Mean age (male) = 32.3 ± 13.7	CS	<ul style="list-style-type: none"> Suicide ideation and plans were higher in patients with narcissistic personality disorder, paranoid personality disorder, and depressive personality disorder. Suicidality did not differ in other personality disorder groups.
Yazici et al, 2018 ⁹⁰	N = 202 participants (patients and first-degree relatives) Female: 44% Age range: 24-65 (M = 41.63, SD = 9.18),	CS	<ul style="list-style-type: none"> The relatives' affective temperament was not related to the patients' symptom severity, clinical severity of schizophrenia, and functionality of the patients. Depressive temperament scores of relatives predicted the number of suicide attempts.

ASD, autism spectrum disorder; CC, case-control study; CS, cross-sectional study; DEAs, disordered eating attitudes; HC, healthy controls; M, mean; MDD, major depressive disorder; OCD, obsessive-compulsive disorder; PD, panic disorder; PS, prospective study; SA, suicide attempt; SAD, social anxiety disorder; SI, suicidal ideation.

females.³⁰ In contrast, another study indicated that females, compared to males, had significantly higher rates of suicide attempts.³⁴ Moreover, a single study identified the female gender as a risk factor for suicide attempts.⁴⁶ Another study indicated that suicide attempts were equally common among Turkish females and males.³¹

Education. Three studies found an association between suicidal ideation and a low level of education.^{20,21,39} One study identified a low level of education as a predictor of suicide probability.⁴⁷

Individual Factors

Coping Styles/Strategies. A total of 4 articles investigated the relationship between coping styles/strategies and suicide. A study with

adolescents found that Non-suicidal self-injury (NSSI) behavior before the suicide attempt is associated with higher emotion-focused coping.³³ Another study with high school students reported that lack of use of the optimistic style and higher use of the helpless style are common predictors of suicide probability in girls and boys. However, lack of use of seeking social support style was a predictor of suicide probability only among boys.⁴⁸ Similarly, a study with 470 patients diagnosed with physical illness found that helpless and submissive coping styles increased suicide probability, whereas optimistic and social support-seeking styles decreased suicide probability.⁴⁹ In contrast, seeking social support was not a predictor of suicide probability for emerging adults, although the problem-solving style negatively and avoidance style positively predicted suicide probability.⁵⁰

Problem-Solving. The reviewed studies frequently reported the relationship between a lack of problem-solving skills and suicide. For example, a study with psychiatric outpatients found poor problem-solving independent predictor of suicidal ideation and attempts.¹³ Another study investigated the relationship between problem-solving and suicide probability through a model.⁵¹ They found that individuals with high scores in both anger and impulsivity with a lack of problem-solving abilities had higher scores in suicide probability. In addition, a mediational model study found that both hopelessness and problem-solving skills variables predicted suicidality after controlling the other (hopelessness or problem-solving skills).⁵² However, the association between hopelessness and suicide probability scores was significantly more robust.

Similarly, negative orientation to the problems was one of the best predictors of suicide probability among young adults.⁵³ However, a study with Turkish high school students could only partially support the relationship between problem-solving skills and suicide probability.³¹ The authors found that a low self-appraised problem-solving score was an independent predictor of suicide potential in only male adolescents; however, it was not an independent predictor for female adolescents.³¹ Contrary to these findings, low problem-solving skills were positively correlated with the suicide probability; however, it did not significantly predict the suicide probability of adolescents.⁵⁴

Reasons for Living. Schizophrenic patients with suicidal ideation reported fewer reasons for living than those without suicidal ideation.³⁷ However, studies yield inconsistent results on whether reasons for living predict suicide probability.^{53,54} One study found a significant association between reasons for living and suicidal ideation; however, reasons for living did not predict suicide probability.⁵⁴ In contrast, another study identified reasons for living as a significant predictor of suicide probability.⁴⁷

Attachment. The relationship between attachment and STBs was investigated in 3 studies included. One study found gender differences regarding the relationship between attachment to the family and suicide ideation and attempts.²⁴ The results indicated that, for women, low attachment to mother was a significant predictor of suicidal ideation and attempts, whereas, for men, low attachment to father was a significant predictor of suicide ideation and attempts. Another study further investigated attachment types and their relationships with suicidality.⁵² They found that the secure attachment style was negatively associated with suicide probability, whereas preoccupied and fearful attachment styles were positively associated with suicide probability. However, attachment styles predicted suicidality only for women, with secure scores associated with lower suicidality scores and dismissive and preoccupied scores associated with higher suicidality scores. Finally, a fearful attachment style was found to be associated with higher suicide attempt rates among depressed patients.⁵⁵

Hopelessness. A total of 6 studies highlighted hopelessness as a correlate of suicidal ideation and attempts. For example, a cross-cultural study of Turkish and American undergraduate students found that hopelessness was associated with suicidal ideation, and hopelessness scores successfully predicted suicidal ideation in both samples.⁵⁶ Similarly, hopelessness strongly indicated suicidal thoughts among Turkish university students.²⁸ Furthermore, hopelessness was a significant predictor of suicide probability among individuals aged between 15 and 65.⁴⁷ Finally, 2 studies on depressed adolescents

also revealed a positive relationship between hopelessness and suicidal ideation.^{57,58}

Alexithymia. Studies with different clinical groups (patients with major depressive patients and anxiety disorders) yield inconsistent results. For example, a study with patients with a social anxiety disorder found a significant correlation between alexithymia and suicidal ideation.⁵⁹ However, when path analysis was done, the results revealed that total alexithymia scores of social anxiety disorder patients only predicted suicidal ideation scores indirectly through their effects on trait anxiety and subjective depressive symptoms. Contrarily, a study with depressed patients found a significant association between difficulty identifying feelings, difficulty expressing feelings, and suicidal ideation among the clinical sample.⁴⁴ The potential link between alexithymia and suicide was also explored in a non-clinical sample with disordered eating attitudes (DEAs) and behaviors.⁶⁰ The results indicated that the presence of alexithymia was associated with an increased suicide probability in adolescents with DEAs.

Anger. All 4 studies that evaluated anger as a correlate of suicide found an association between different anger variables and suicide. For example, a study with Turkish university students showed that a high level of trait anger was a significant predictor of suicidal behavior.²² In line with these results, another study with young adults identified “vengeful reaction” (a component of interpersonal anger) to the problems as one of the best predictors of suicide probability.⁵³ Moreover, suppressed anger was also found to be associated with suicidal thoughts among young adults.²³

Similarly, a positive correlation between trait anger, anger-in, anger-out, and suicide probability and a negative correlation between anger control and suicide probability was found among Turkish adolescents.⁶¹ Furthermore, using the multiple regression analyses, the authors also confirmed that all anger variables (trait anger, anger-in, anger-out) except anger control significantly predicted the adolescents' suicide probability.

Self-Esteem. All 5 studies evaluated self-esteem as a correlate and found an association between self-esteem and suicidal ideation and attempts. For example, in a sample of patients with various kinds of cancer, self-esteem was significantly associated with current suicidal thoughts.⁶² Similarly, low self-esteem was associated with suicidal thoughts among depressed adolescents.⁵⁷ Furthermore, another study with adolescents found that suicide probability was negatively correlated with self-esteem, and self-esteem was a significant predictor of suicide probability among adolescents.⁶¹ Moreover, 1 study found a gender difference in the relationship between self-esteem and suicide among adolescents.³¹ Self-esteem was a significant predictor of suicidal ideation, attempts, and suicidal risk scores in boys but a significant predictor of only suicidal risk scores in girls. On the contrary, low self-esteem was an independent predictor of suicidal ideation in both sexes and suicide attempts in young female adults in another study.²⁴

Loneliness. Only 2 studies identified in the current review examined the relationship between loneliness and suicide. In a university sample, loneliness accounted for an additional unique variance in suicidal risk in Turkish college students beyond and above other risk factors such as sociodemographic variables and perfectionism.⁶³ Similarly, loneliness significantly predicted suicide probability among Turkish adolescents and adults.⁴⁷

Environmental Factors

Social Support. Among social support types, familial social support was frequently mentioned as correlated with suicidal ideation and attempts. A low level of perceived social support from family emerged as a significant predictor of both female and male adolescents' suicide probability.⁴⁸ Furthermore, individuals with suicidal ideation/attempts reported social/familial support less than individuals without suicidal ideation/attempts.⁶⁴ Similarly, lower perceived family support was associated with suicide attempts among adolescents.⁵⁷

Family-Related Factors. Numerous different family-related factors were mentioned as correlates of suicidal ideation and attempts. For example, a study with suicide attempters identified family problems as the most common cause of suicide attempts and family history of psychiatric disorders as the most important risk factor for suicidal ideation.⁶⁵ Similarly, another study with adolescents with a history of suicide attempts identified dysfunctional family and mother psychopathology as correlates of suicidal ideation. Moreover, a study with individuals in the Turkish probation system identified a lack of affective involvement in the family system as the most important predictor of suicide probability.³⁶ Furthermore, a single study testing General Strain Theory found that parental strain was associated with suicidal ideation and attempts among adolescents.³⁵ Lastly, the separated family background was found to be associated with suicide attempts among depressed adolescents.⁵⁷

Childhood Trauma and Adverse Life Experiences. A study with a clinical sample consisting of euthymic bipolar disorder patients reported a statistically significant and positive correlation between childhood traumatic experiences and suicide probability.⁶⁶ These results were confirmed by another study with OCD patients.⁶⁷ A mild correlation was detected between the suicide probability score and childhood trauma scores. Further evidence supporting the relationship between childhood traumatic experiences and suicidality has been provided by a study with depressed patients.⁶⁸ The results showed that patients with the major depressive disorder who had attempted suicide reported significantly higher Childhood Trauma Questionnaire scores than patients who had never attempted suicide.

These results echoed in a study conducted with university students.²⁴ The authors found that sexual childhood sexual abuse instances were associated with both men's and women's suicidal ideation; however, they were only related to men's suicide attempts. Another study investigating correlates of suicidal ideation among adolescents has revealed a relationship between suicidal ideation and exposure to violence and sexual abuse.⁶⁹ They found that adolescents exposed to beatings, force, and other physical means in the household within the past year had higher suicidal ideation scores than adolescents who were not exposed to. Moreover, adolescents who had experienced mockery, humiliation, and exclusion in the household and a school environment within the past year had higher suicidal ideation scores than those who were not exposed to. Similarly, a study with children and adolescents seeking treatment for substance use disorder found that physical and sexual abuse increased the risk of suicide attempts.⁷⁰

These findings were replicated in studies focused on a clinical sample. For example, a study with patients diagnosed with dissociative disorders reported that suicidal patients had elevated scores for childhood emotional abuse, physical abuse, and emotional neglect

compared to non-suicidal groups.⁴⁰ However, childhood physical neglect did not differ between the suicidal and non-suicidal groups. Furthermore, childhood emotional neglect was found to be a significant predictor of suicide attempts in patients with bipolar disorder type I.⁷¹ Negative life events strain and physical victimization strain were associated with suicidal ideation and attempts among adolescents.³⁵

In contrast to these findings, a single study failed to find an association between childhood trauma and suicidality in patients with schizophrenia.⁷² This difference could result from variations in abuse definitions, methods (measurement of suicide, presence of control group), and sample groups among different studies.

Health-Related Factors

Substance Use and Smoking. Substance use (including alcohol and/or smoking) was mentioned as a correlate in 7 studies. For example, a study with children and adolescents seeking substance use treatment reported that using cannabis and cocaine was a risk factor for a history of suicide attempts. In addition, polysubstance use was associated with both suicide attempts and non-suicidal self-injurious behaviors.⁷⁰ Further evidence supporting the relevance of substance use in the risk of suicide has been provided by another study with adolescents.⁶⁹ They reported that adolescents who use alcohol or marijuana or bally-thinner or smoked cigarettes had higher suicidal ideation than those who did not use or smoke.

Similarly, another study found that adolescents who abuse drugs presented the highest suicide risk.²⁹ Another study reported that individuals with a history of alcohol abuse had significantly higher suicidal ideation than those without.⁴¹ Moreover, suicide risk was higher among older adults who use alcohol and using alcohol and smoking cigarettes increased the recurrent suicide risk among suicide attempters.^{73,74}

Sleep Quality. Sleep quality was infrequently mentioned as a risk factor. One study reported that subjective sleep quality over the last month in OCD patients and the intake of sleeping pills were related to past suicidal thoughts and attempts.³⁸ On the contrary, the second study did not find any relationship between sleep quality and suicidality in patients with schizophrenia.⁷²

Obsessive Symptoms. Studies conducted with different clinical groups yield different results. For example, a study with depressed patients did not find a relationship between suicidal ideation and obsessive beliefs.⁷⁵ Yet, another study found that patients with a history of previous suicide attempts were more likely to have a comorbid diagnosis of OCD, and compulsive symptoms significantly predicted suicide attempts in patients with schizophrenia.⁴³

Depression. Depression was found to be associated with suicidal ideation in numerous reviewed studies.^{21,31,42,57,76} However, only 1 study found an association between depression and suicide attempt.³¹

DISCUSSION

This review shows that the prevalence rates vary by age, methodology, as well as population studied. Our review also identified various associated factors with suicide ideation and attempts. However, only 18 of them were examined in more than 1 study. Multiple factors were identified in a single study.⁷⁷⁻⁹⁰ These factors can be important areas for future research (see Table 2).

This review found evidence that variables such as poor problem-solving skills, coping strategies, hopelessness, childhood trauma, adverse life experiences, loneliness, lack of social support, family-related factors, anger, low self-esteem, attachment, substance use, and depression were associated with suicidal ideation and attempts.

Despite this, this review has highlighted inconsistencies in whether variables such as alexithymia, sleep quality, and obsessive symptoms were related to suicidal ideation and attempts. In addition, variables such as education, female gender, and reasons for living were only found to be associated with suicidal ideation.

Although most studies examined the incidence of only 1 or a few specific correlated factors, 2 studies showed that a combination of correlated factors could increase suicide probability.^{51,52} A recent systematic review suggested that certain factors interact with each other, and the synergistic effect between all the factors can be more powerful than their single influence on suicide.⁹¹

Strengths, Limitations, and Areas for Future Research

A critical strength of this review is that it comprehensively covers both suicidal ideation and attempted suicide. In addition, this review includes publications in 2 languages (Turkish and English).

Regarding the limitations of this review, it could be argued that all the studies included in this review were from Turkey; therefore, the generalizability of the findings to other cultures or geographical contexts might be limited. In addition, this review did not include any qualitative studies, non-published studies, or thesis studies. Therefore, there is a possibility that important studies may have been missed. However, given the large number of studies identified initially, it was not thought necessary to broaden the search at this time. Future systematic review studies can include gray literature, such as dissertations and conference reports to have more representative studies.

Furthermore, studies on suicide death were not included. A few studies suggest that STBs have some different predictors and correlate with a suicide death, which means that studies of STBs may not fully generalize when it comes to understanding suicide itself.⁹² Therefore, a systematic review solely focusing on the prevalence and correlates of suicide death in Turkey is urgently needed.

Also worth mentioning are several methodological limitations of existing research. For example, correlate, risk, and risk factor terms were inconsistently and imprecisely used in reviewed studies. Such confusion can create miscommunication between researchers, unfounded assumptions about how suicidal behavior occurs, and assessing, understanding, and eventually try predicting it best. Furthermore, it can misguide research, treatment, and policy decisions about suicide.^{7,93}

According to the risk factor typology, a correlate is a factor that is associated with another factor.⁹³ For example, suppose the study results indicated that individuals who attempted suicide tended to display depression symptoms. In that case, this can be interpreted as depression symptoms correlating to suicide attempts. However, the nature of this association is unclear, and we cannot know how or why depression symptoms and suicide attempts were correlated. Suppose many cross-sectional studies found this strong correlation; we may assume depression is a powerful risk factor and make this factor a centerpiece of theories, risk assessments, and treatments.⁷

However, without evidence from longitudinal studies, there would be no empirical justification for considering depression as a risk factor or integrating this factor into theory and practice. In order to consider depression as a risk factor for a suicide attempt, individuals with depressive symptoms (at Time 1) should be more likely than others to attempt suicide (at Time 2). Cross-sectional studies are sufficient to determine correlates or concomitants, but longitudinal or prospective studies are required to identify risk factors.

Most studies included in this review were solely based on a cross-sectional design, making it difficult to determine the causal relationships between the studied risk factors and outcome variables (suicidal ideation and suicide attempts). Therefore, future research should use a prospective study design to evaluate causal relationships since a better understanding of the causal mechanisms will lead to improved intervention strategies. In a meta-analysis of studies that have attempted to predict a specific STB-related outcome longitudinally, the authors found that longer follow-up intervals did not enhance the predictive ability.⁷ Therefore, future studies can use shorter follow-up intervals in their design, such as hours, days, and weeks instead of months, years, and decades. In addition, the same meta-analysis study stated that there is a need for novel risk factors and suggested that future studies should test novel risk factors that have recently been proposed, such as implicit association with life/death and acquired capability of suicide.⁷ Moreover, as we mentioned earlier, 2 reviewed studies showed that a combination of correlated factors could increase suicide probability.^{51,52} This suggests that future studies should consider risk algorithms (complex but replicable algorithms based on a combination of several risk factors) to predict STBs.

In addition, several studies used single-item assessments to measure STBs. However, this practice can be problematic since participants may endorse suicidal ideation or history of suicide attempts without meeting the standardized criteria for both when asked for more information.⁹⁴ Moreover, several studies used dichotomized “yes and no” answers to understand participants' presence versus the absence of STBs. However, this can also be problematic since suicide risk may be a rare instance of a categorical construct, with high suicide risk being categorically distinct from low suicide risk.⁹⁵ In addition, dichotomizing continuous variables may create problems such as loss of statistical power and increased false positive rates.⁹⁶ The diverse measurement approaches used in reviewed studies made it difficult to compare findings and integrate knowledge across studies.

Another relevant methodological issue was that few studies lacked “healthy” control groups, limiting the authors' ability to infer whether suicidal ideation and attempts were more common in the studied groups than in the age-matched general Turkey population.

Although reviewed studies investigated several different factors as a correlate of suicide, 2 factors, namely unemployment and chronic pain, remained understudied. Economic uncertainty has been found to be associated with an increase in male suicidal behavior.⁹⁷ Considering the economic uncertainty experienced in Turkey, future studies can investigate the relationship between employment, being the sole earner in a family, and male suicides in Turkey. Moreover, a recent meta-analysis showed that STBs were more common among individuals with chronic pain than those without pain.⁹⁸ World Health Organization has acknowledged chronic pain as a key risk factor for suicide.⁹⁹ Despite international recognition, reviewed studies failed to investigate chronic pain as a correlate/risk factor of suicide.

Finally, cross-cultural studies reviewed in this study highlighted that culture plays a fundamental role in suicide. In addition, it has been now documented that culture can be targeted in experimental paradigms by using techniques such as autobiographical reflection, explicit instruction, priming, language, persuasive text, imagery, social comparison, laboratory games, fabricated feedback, and exogenous administration.¹⁰⁰ This opportunity can facilitate using an experimental design in suicide research. Therefore, culture should be considered in future models of suicide, and researchers should include different culturally specific variables in their studies.

Clinical Implications

Understanding the correlates and risk factors of suicide is imperative for mental health professionals and clinicians to identify individuals at risk and develop more effective suicide treatment and prevention interventions. It is also crucial to conduct regular comprehensive suicide screening and assessments. The correlated factors identified in this review can be included in comprehensive suicide screening and assessments administered in Turkey.

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