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What are the risk factors and protective factors of suicidal behavior in adolescents? A systematic review

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Abstract

Problem: Suicidal behavior is the third leading cause of death in adolescents in the world. Suicide behavior in adolescents can be prevented by recognizing risk factors and protective factors originating from themselves and the surrounding environment. This study aimed to identify risk factors and protective factors for adolescents who demonstrate suicidal behavior.

Methods: A systematic search in four databases, including ScienceDirect, EBSCO, Direct Open Access Journal, and ProQuest, was performed using the terms "suicide," "risk," and "adolescent." The search was limited to publications between 2015 and 2019. Articles were selected using PRISMA, a total of 66 articles were analyzed in the systematic review, all of which were quantitative studies.

Findings: Based on the synthesis results, it was found that internal risk factors, external risk factors, and protective factors for adolescents who demonstrate suicidal behavior.

Conclusion: The results indicated that there are risk factors, both internal and external factors inhibiting suicide behavior in adolescents, which were rarely considered in the promotion and prevention effort of adolescent suicidal behavior.

KEYWORDS
adolescent, protective factor, risk factor, suicide

1 | INTRODUCTION

Suicidal behavior is a conscious and deliberate act carried out by an individual to end his life both directly and indirectly (Nandini, Chaube, & Dahiya, 2018; Riyadi & Teguh, 2009; Todeshkchuei, Molaeinezhad, & Todeshkchuei, 2019; Yosep, 2007). Suicidal behavior encompasses suicidal ideas, plans/threats of suicide, attempted suicide (Chan et al., 2018; Huang et al., 2018; Stuart, 2016; Valdez-Santiago et al., 2018). Around 800,000 people worldwide die each year from suicide, and it is estimated that out of every 100,000 population, there are 10.5 suicides. According to the World Health Organization (WHO), every 40 s, there are more than 20 suicide attempts made, where one person in the world dies from suicide (WHO, 2019b). In Indonesia, it is estimated that there are 5.2 suicides in every 100,000 male population. Whereas in the female population, there were 2.2 suicides in every 100,000 population (WHO, 2019a).

Suicide can occur in all people of all ages. In adolescents, suicide attempts occur more frequently, and suicide success is higher than in others. In 2016, 62,000 teenagers died from suicide. In the United States, suicide is the second leading cause of death for adolescents ages among individuals aged 15–19 years (Heron, 2019). Based on data from the 2019 Youth Risk Behavior Survey on high school students Grades 9–12 in America, 23.4% had seriously considered attempting suicide, 19.5% had made suicide plans, 10.0% had attempted suicide one or more times, and 35.6% had suicide attempt that resulted in injury, poisoning, or overdose (Montana Office of Public Instruction, 2019). In Indonesia, the prevalence of suicide ideas in adolescents reaches 6.1% in women and 4.1% in men, while the prevalence of suicide ideas accompanied by suicide plans is as

much as 3.5% in women and 2.1% in men (McKinnon, Gariépy, Sentenac, & Elgar, 2016).

It has been recognized that risk factors and protective factors play an essential role in suicidal behavior in adolescents. For this reason, WHO states that suicide risk factors occur due to previous suicide attempts, loss experience, loneliness, discrimination, relationship breakdown, mental health disorders such as depression, financial problems, chronic illness and illness, violence, harassment, and conflict or circumstances other humanitarian emergencies as risk factors for suicide (WHO, 2014). However, there are other risk factors, such as personal characteristics, individual religiosity, also family, and social factors (Nazeer, 2016).

Many studies have been conducted to investigate the causes of suicidal behavior. However, literature reviews aimed at understanding risk factors and protective factors for suicidal behavior are still minimal. This systematic review aims to identify and synthesize suicide risk factors both internally and externally, as well as protective factors from suicidal behavior in adolescents.

2 | METHODS

Researchers conducted a systematic search on English language articles published from 2015 to 2019. An electronic database search was conducted in September 2019 on four databases, namely ScienceDirect, EBSCO, Direct Open Access Journal, and ProQuest. In a systematic review, there is no search for gray literature.

The search was carried out using three keywords, including "suicide," "risk," and "adolescent." The author uses each of these keywords in the search, and then the authors combine the three keywords with the conjunction "and," this stage is carried out in each database.

2.1 | Inclusion and exclusion criteria

Articles are filtered clearly and strictly based on inclusion criteria, namely articles that discuss matters related to new and unique risk factors suicide behavior specifically on adolescents, other than those already explained by WHO in 2014. Articles obtained in the search process are then selected based on inclusion and exclusion criteria. The inclusion criteria in the systematic review are: (1) The research discusses new risk factors for suicide behavior (suicide ideation, suicide plan, and suicide attempted); (2) Research respondents are teenagers aged 10–24 years old; (3) Full text available; (4) Articles published from 2015 to 2019; (5) Articles are cross-sectional, longitudinal, case-studies, and randomized control trial studies.

The exclusion criteria in the systematic review are:

(1) The article discusses previous suicide attempts, experiences of loss, loneliness, discrimination, broken relationships, financial problems, chronic illness and illness, violence, harassment, and conflict or other humanitarian emergencies as traditional risk factors for suicidal behavior. (2) Not a research article (commentaries, editorials, reviews, scientific statements). (3) Articles that do not use English. (4) Articles focus on interventions, instruments, and mortality.

2.2 | Quality assessment

To assess the quality of articles, appropriate JBI critical appraisal tools were used in the systematic review. Research that fulfilled 60% of the JBI checklist was included in this review. Articles were critically screened and selected by two reviewers, and articles of uncertain quality were reassessed by reviewers to determine the suitability of inclusion criteria in the review.

2.3 | Search outcomes

A total of 7814 articles were obtained from searches in four databases using predetermined keywords. Based on the abstract review and title, 7469 articles were not appropriate. Researchers identified 24 duplicated articles. A total of 321 articles obtained were analyzed based on the full-text. Sixty-six articles were following JBI, included in the inclusion and exclusion criteria in this review. The reason 255 articles were not included in this review was the age discrepancy of the study respondents in the article, who were less than 10 or more than 24 years old, as well as the article that discussed the risk factors for suicidal behavior that had been explained by WHO. The literature selection process is illustrated in Figure 1, with a summary of articles that met the systematic review criteria explained in Table 1 (attached).

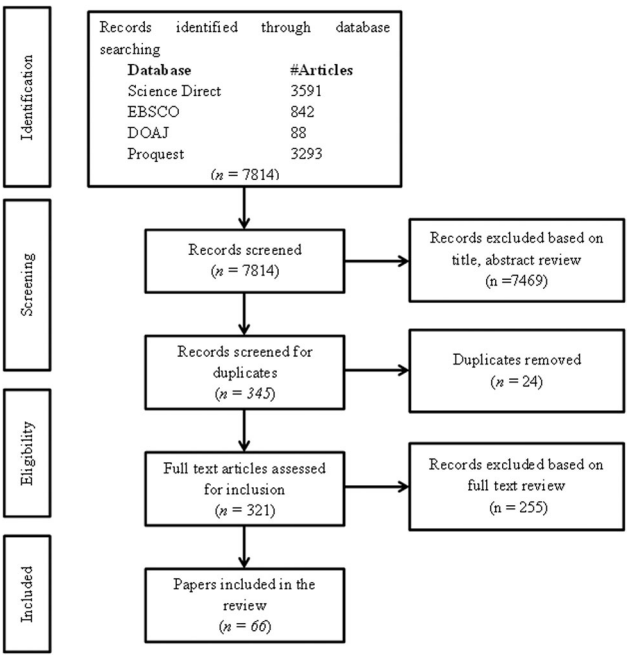

FIGURE 1 PRISMA flowchart for systematic review

TABLE 1 Summary of articles included in the study ($n = 66$)

No	References	Main findings
1–13	Mulenga, Kwangu, Njunju, Mazaba, and Siziya (2017); Mulenga, Kwangu, Njunju, Siziya, and Mazaba (2017); Mulenga, Mazaba, Kwangu, Njunju, and Siziya (2017); Mulenga, Siziya, Mazaba, Kwangu, and Njunju (2017); Siziya et al. (2017); Siziya, Njunju, Kwangu, Mulenga, and Mazaba (2017); Mazaba, Mulenga, Kwangu, Njunju, and Siziya (2017); Mazaba, Siziya, Mulenga, Njunju, and Kwangu (2017); Mazaba, Siziya, Njunju, Kwangu, and Mulenga (2017); Mazaba, Njunju, Kwangu, Mulenga, and Siziya (2017); Kwangu et al. (2017a,2017b); Njunju, Mazaba, Mulenga, Siziya, and Kwangu (2017)	– SI is negatively related to having understanding parents – SI is positively related to food security, lack of close friends/ absence of close friends, missing school/class
14	Abdollahi and Carlbring (2017)	– SI is negatively related to adaptive perfectionism and task-focused coping and positively related emotion-focused coping, avoidance coping, and maladaptive perfectionism – Coping style (task-focused, emotion-focused, and avoidance coping) moderate the relationship between perfectionism and SI
15	Abdollahi, Hosseinian, Zamanshoar, Beh-Pajooh, and Carlbring (2018)	– Poor problem-solving skills are positively related to SI – Hardiness/fortitude is negatively related to SI – Hardiness is a mediator between problem-solving and perceived stress with SI
16	Li, Li, Wang, and Bao (2016)	– Family warmth is negatively related to suicidality in adolescents – Parental warmth is negatively related to hopelessness which affects the suicide rate in adolescents
17	Mandracchia, To, and Pichette (2016)	– The difference between perceived body weight and ideal body weight is a predictor of SI and SA – The risk of SI and SA is high on a female adolescent with poor body image and negative past experiences
18	Price and Khubchandani (2017)	– SI and SA are related to feeling sad/hopeless and being threatened at school
19	S. M. Kim, Baek, Han, Lee, and Yurgelun-Todd (2015)	– The relationship between attention deficit and increased suicide ideas in adolescents
20	Koutek, Kocourkova, and Dudova (2016)	– A female adolescent with eating disorder is at risk of suicidal behavior
21	M.-H. Kim, Min, Ahn, An, and Lee (2019)	– Conflict with family and friends due to smartphone use is positively related to SA – Longer time on a smartphone was significantly associated with suicide attempts – Adolescents who used a smartphone for process purposes were related to suicide attempts – Adolescents who used a smartphone for social purposes was shown to be protective against suicide attempts
22	Pham et al. (2019)	– SI is significantly related to perceived financial burden and non-self-determined motivation profile
23	Arat (2017)	– Low hunger and adequate nutrition are protective factors of suicide behavior
24	Hammerton, Zammit, Thapar, and Collishaw (2016)	– Increased suicide in adolescents, maternal suicide attempts, parent–child relationships is in line with the severity of maternal depression
25	Lensch, Clements-Nolle, Oman, Lu, and Dominguez (2018)	– There is a direct relationship between maternal severe chronic depression with SI and there is an indirect relationship through offspring disorder, parent–child relationships, and maternal attempts
26	Loas, Solibieda, Rotsaert, and Englert (2019)	– Parent/child interactions or assets (i.e., family communication, mother/child relationship, and parental monitoring) are protective factors of suicidal behavior

(Continues)

TABLE 1 (Continued)

No	References	Main findings
27	Lew et al. (2019)	– The major risk of suicide is hopelessness while the minor risk of suicide is an orientation to happiness and coping styles (including self-distraction, self-blame) – The protective factor for suicide was the presence of meaningful life
28	MacKin, Perlman, Davila, Kotov, and Klein (2017)	– Adolescents with high life stress, especially interpersonal, are significantly related to the level of suicidal behavior – Higher levels of parental support were associated with lower levels of suicidality. The effect of peer support was not as strong
29	Nunes and Mota (2017)	– The quality of emotional ties with parents is positively related to the authoritative style and negatively related to the authoritarian and permissive styles and SI – There is a parental attachment mediation in the relationship of parenting styles with SI
30	Pandey et al. (2019)	– Food insecurity was identified as risk factors of suicidal ideation – Having three or more close friends was found to have a protective effect against the suicidal attempt
31	Rey, Quintana-Orts, Mérida-López, and Extremera (2019)	– Gratitude is negatively related to the idea of suicide and suicidal behavior – Gratitude/thankfulness, namely acknowledging/accepting that someone always gets positive results and acknowledging/accepting that there is an external role in positive results
32	Eun (2019)	– The risk of suicide in adolescents is related to political regimes – This is related to the policies implemented in each period. For example, related to college entrance examination policies
33	Carvalho, da Motta, Sousa, and Cabral (2017)	– Reassured self (ability to calm down when facing difficulties), external shame (individuals consider themselves to look bad in the eyes of others), and neglect from the paternal figure is significantly related to the idea of suicide
34	Balazs et al. (2018)	– The risk of suicide is related to internalization (emotional problems) and external (relationship problems with peers) and poor quality of life – Quality of life is a mediator between internal and external problems with the risk of suicide
35	Kasahara-Kiritani et al. (2015)	– Students without the risk of suicide ideas read more books and watch more films than students with SI – Increasing the number of books read the lower the SI level – The more number of movies watched the lower the SI level
36	S. M. Kim et al. (2015)	– In male adolescent, high perceived sadness/hopelessness associated with SA – In female adolescent, low academic achievement, poor perceived health status, high perceived stress, and unhealthy coping strategy related to SA
37	Ziaei et al. (2017)	– Worried because unable to eat or feeling hungry related to SI
38	S. Y. Kim, Sim, and Choi (2017)	– Lack of sleep and low school performance significantly related to SA – Abnormal sleep time and low school performance were also proportionally related to higher energy drink intake – Frequent energy drink intake was significantly associated with SA
39	Shayo and Lawala (2019)	– Food insecure adolescents were more likely to have experienced SI and SA – Adolescents who had parental attachment were significantly less likely to have experienced SI than SA

TABLE 1 (Continued)

No	References	Main findings
40	Cole-Lewis, Gipson, Opperman, Arango, and King (2016)	– Private religious practice and organizational religious were associated with less SI
41	Sharma, Nam, Kim, and Kim (2015)	– Perceived unhappiness was significantly associated with suicidal ideation – Lack of parental understanding and less time spending with parents significantly related to SA
42	Park, Lee, and Lee (2016)	– Energy drink intake was significantly associated with sleep dissatisfaction, severe stress, depressive mood, suicidal ideation, a suicide plan, and suicide attempt
43	Fang (2018)	– The prevalence of SA was higher in low-income schools compared to middle-income schools for boys but not girls – Among those with suicidal thoughts, the prevalence of attempted suicide was also higher in low-income schools compared to middle- and high-income schools for male adolescents only
44	DeCamp and Bakken (2016)	– Unhealthy dieting behaviors were generally associated with NSSI and suicidal ideation
45	Karia, Mehta, Harshe, Sousa, and Shah (2016)	– A positive correlation of suicidal behavior with insomnia severity, nightmare distress, the emotional intensity of dreams, and daytime mood affected by dreams
46	Zullig, Divin, Weiler, Haddox, and Pealer (2015)	– Students who had reported any nonmedical use of prescription drugs were more likely to report suicidal ideation – Nonmedical use of pain relievers, stimulants, and depressants significantly related to suicidal behavior – Nonmedical use of depressants was associated with greater odds of suicide attempts and among females who reported nonmedical use of stimulants
47	Anderson, Hayden, and Tomasula (2015)	– There is a significant relationship between overweight female status and SA
48	Guo et al. (2017)	– Short sleep was positively associated with SI than SA – Long sleep was only significantly associated with SA – Depressive symptoms demonstrated that depressive symptoms may have moderating effects on the associations between sleep duration and suicidality
49	Seo, Kim, Yang, and Hong (2017)	– Late electronic media use was significantly associated with increased mood disturbances including depression and suicidality directly, but not indirectly via sleep duration or disturbances
50	Kitagawa et al. (2017)	– Self-reported appetite loss and insomnia was highly associated with suicidal ideation in adolescents – Suicidal ideation increased significantly as the degree of appetite loss increased
51	Chiu, Tseng, and Lin (2017)	– Adolescents with parents who quarrel often have a greater risk for SI than those without parents who quarrel frequently – Frequency of fighting with parents significantly increases SI – Adolescents with broken friendships and revenge against friends are at higher risk for SI
52	Jacob, Stubbs, and Koyanagi (2020)	– Individuals who consumed carbonated soft drinks (3 and >4 times/day) were more likely to have reported an attempted suicide in the past 12 months
53	Koyanagi et al. (2019)	– Severe food insecurity (most of the time/always hungry) [vs. no food insecurity (no hunger)] was significantly associated with higher suicide attempts
54	Kim, Kim, and Seo (2018)	– SI and SA on individuals who consumed the drinks more than once daily were higher relative to those who consumed the drinks 3–6 and 1–2 times weekly

(Continues)

TABLE 1 (Continued)

No	References	Main findings
		– SI and SA were highest in individuals who drank caffeinated energy drinks more than once per day
55	Chen et al. (2017)	– Menarche at ≤11 years was associated with increased risk of SI – Menarche at 12 years was associated with SP – Irregular menstrual cycles are associated with an increased risk of SI and menstrual periods less than or equal to 4 days significantly related to SP
56	Liu, Zhao, and Jia (2015)	– Parental insomnia was significantly associated with increased risk for SI and SP – Adolescents with insomnia parents were more likely to report SI, SP, and SA than those who did not
57	Vancampfort et al. (2019)	– SA increases with the increase in sedentary leisure time per day
58	Sami, Danielle, Lihi, and Elena (2018)	– Adolescents with SI had higher rates of sleep disturbances, Internet addiction, and depressive symptoms – The effect of sleep disturbances on SI moderated by the impact of Internet addiction and mediated by the sleep effects on depressive symptoms
59	Kwok, Yeung, Low, Lo, and Tam (2015)	– Rational problem-solving negatively associated with SI for males, but not for females – Emotional competence and rational problem-solving moderated the relationship between physical abuse and suicidal ideation in females, but not in males – High rational problem-solving buffered the negative impact of physical abuse on SI for females
60	Davis, Doyle, and Nahar (2020)	– Prescription opioid misuse in the last 1 year was significantly associated with each dimension of suicidality – SI increased significantly on individuals in minority, having a lower GPA, and having a diagnosed psychological disorder, being a marijuana user, and frequency of binge drinking – Racial or sexual minority, lower GPA, psychological disorder, and other drug use were all associated with an increased of SA in the past 12 months
61	Pfledderer, Burns, and Brusseau (2019)	– Carrying a weapon to school for one or more days, not going to school for at least 1 day all significantly related to higher of reporting SI – More hours of sleep were significantly associated with lower of reporting SI, SI decreases with increasing sleep time – Being at or above the overweight cut-off for BMI percentile associated with risk of SI
62	Park and Jang (2018)	– There is a positive relationship between suicide rate and the rate of depressive mood, SI, SA in men but not in women
63	S. H. Kim, Kim, Yoo, and Ryu (2019)	– Perception of stress, depression, and suicidal ideation is significantly related to parental occupational status – SI in adolescents was associated with parents' employment status, work status, work schedule patterns, and working hours per week – Adolescents' SI was higher when the father was unemployed or self-employed, as opposed to when the father was a paid worker, and also higher when the father worked casual hours as opposed to when the father was a full-time employee
64	Park, Yang, and Kim (2019)	– SI was significantly influenced by sleep duration, economic status, perceived health status, and depression – The indirect effect of insufficient sleep on suicidal ideation was mediated by depression
65	B. P. Liu et al. (2019)	– Stressful life events were significantly associated with overall suicidality, SI, and SP

TABLE 1 (Continued)

No	References	Main findings
		– Insomnia was an independent risk factor of suicidality and a mediator of the association between stressful life events and suicidality SI, SP, and SA
66	Wong, Brower, and Craun (2016)	– Insomnia symptoms (i.e., difficulty falling asleep, difficulty staying asleep, and early morning awakening) related to SI, SP than SA – Difficulties falling and staying asleep had a significant relationship with 12-month and lifetime suicide

3 | RESULTS

A total of 66 studies were obtained based on the selection process and included in the systematic review. Most of the studies came from countries in Asia (n = 50%) with the majority coming from Korea (n = 16.7%), Middle Eastern countries (n = 10.6%), and China (n = 10.6%). Research is also often carried out in the Americas (n = 22.7%) including the United States (n = 12.1%), Jamaica, Peru, Suriname, Trinidad and Tobago, Oklahoma, California, and Mississippi, as well as in the European continent (n = 13.7%) such as Italy, United Kingdom, Czech Republic, Belgium, Portugal, Spain, and Hungary. Only four studies were carried out on the African continent (n = 6%; Arat, 2017; Kwangu, Mulenga, Mazaba, Njunju, & Siziya, 2017; Mulenga, Kwangu, Njunju, Siziya et al., 2017; Shayo & Lawala, 2019), and two studies from the Pacific islands (n = 3%; 20.21). Also, there were three studies conducted in various countries and on more than one continent (n = 4.6%; Jacob et al., 2020; Koyanagi et al., 2019; Vancampfort et al., 2019).

The study participants consisted of adolescents, both men and women, adolescents who attended high school to college, adolescents who underwent mental health units (psychiatric units) and emergency units, and adolescents who consumed energy drinks. Participants aged between 10 and 24 years, with an average age of participants 13.58–22.82 years. The number of study participants was at least 47 respondents (Koutek et al., 2016) and at most 829,861 respondents (Eun, 2019), with the percentage of female respondents ranging from 42.7% to 65.96% and the percentage of male respondents representing 34.04% to 57.3%.

All studies included in the systematic review had a quantitative research approach, with the majority being cross-sectional (n = 90.1%). Only six studies used the longitudinal study approach (n = 9.1%).

3.1 | New risk factors for suicidal behavior in adolescents

In this systematic review, risk factors that will be discussed are aside from previous suicide attempts, loss experience, loneliness, discrimination, relationship breakdown, financial problems, chronic illness and illness, violence, harassment, and conflict or humanitarian emergencies as risk factors for suicidal behavior. The systematic results of this review can be seen in Figure 2. New risk factors for adolescent suicide behavior are classified into internal risk factors and external risk factors:

3.1.1 | Internal risk factors

There are six internal risk factors for adolescent suicidal behavior, including ineffective coping, smartphone abuse, nutritional imbalance, menarche, and menstrual problems, poor lifestyle, and disturbed sleep and rest patterns. Ineffective individual coping includes individual nature and characteristics, low coping, and problem-solving skills. The nature and characteristics of individuals who are positively related to the risk of suicidal behavior in adolescents include negative affectivity on personality type D, maladaptive perfectionism, anhedonia (loss of pleasure), and external shame (Abdollahi & Carlbring, 2017; Abdollahi et al., 2018; Carvalho et al., 2017; S. M. Kim et al., 2015; Loas et al., 2019; Mandracchia et al., 2016; Price & Khubchandani, 2017), while hardiness, reassure self and gratitude negatively associated with suicidal behavior in adolescents (Abdollahi et al., 2018; Carvalho et al., 2017; Rey et al., 2019). Interestingly, in medical students, nonself-determination motivation profiles are associated with the occurrence of suicide ideas (Pham et al., 2019). Coping patterns in adolescents are also associated with suicidal behavior. Unhealthy coping strategies, emotional focused coping, and avoidance coping are positively related to suicidal behavior in adolescents while task-focused coping is negatively related to suicidal behavior in adolescents (Abdollahi & Carlbring, 2017; S. M. Kim et al., 2015). In addition, poor problem skills in adolescents are positively related to suicide ideation in adolescents (Abdollahi et al., 2018).

The second internal factor of suicidal behavior in adolescents is smartphone abuse. Smartphone abuse includes duration and purpose of usage such as studying, information retrieval, games, conflicts with families due to smartphones, and late electronic media use, which are positively related to suicidal behavior (M.-H. Kim, Min et al., 2019; Seo et al., 2017). The third internal factor is a nutritional imbalance, an unhealthy diet like energy drink intake, carbonate soft drink intake, food insecurity, eating disorder and overweight status in female, and appetite loss are nutritional factors related to suicidal behavior (Anderson et al., 2015; Canbaz & Terzi, 2018; DeCamp & Bakken, 2016; Jacob et al., 2019; S. Y. Kim et al., 2017; Kitagawa et al., 2017; Koutek et al., 2016; Koyanagi et al., 2019; Park et al., 2016). The fourth risk factor is menarche and menstrual cycle,

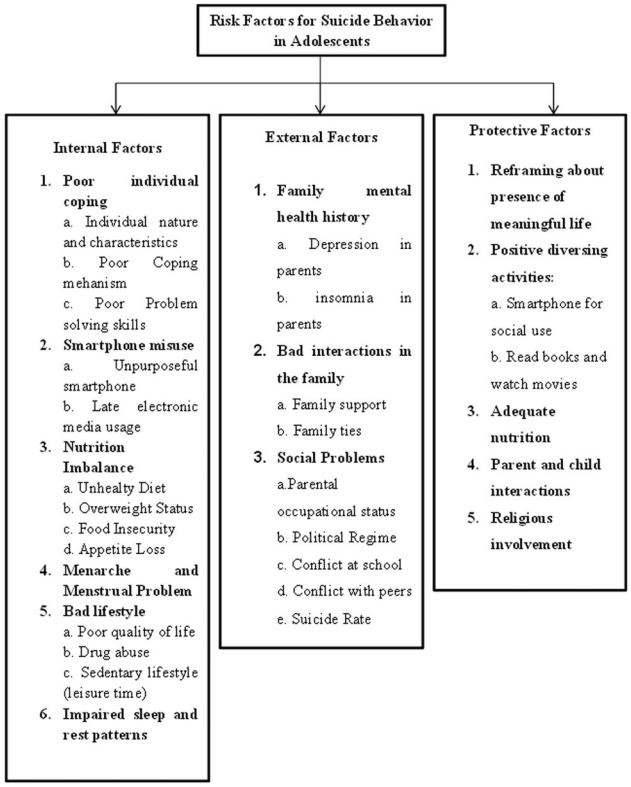

FIGURE 2 Risk factors for suicidal behavior in adolescents

female adolescents who experience menarche less than 11 years old are associated with the idea of suicide, while those who experience menarche at the age of 12 years old are associated with suicide plans. Also, irregular menstrual cycles are associated with an increased risk of suicide ideas in female adolescents (Chen et al., 2017).

Poor lifestyle includes quality of life is also an internal factor of suicidal behavior in adolescents. Poor quality of life in adolescents is associated with suicidal behavior (Balazs et al., 2018). Nonmedical use of prescription drugs (pain relievers, stimulants, and depressants) is also significantly related to suicidal behavior (Zullig et al., 2015). Interestingly, leisure time or leisure time in teenagers is also related to suicide attempts. Suicide attempts to increase with increasing sedentary leisure time per day (Vancampfort et al., 2019). In addition, sleep and rest patterns such as lack of sleep, abnormal sleep time, sleep disturbances, duration of sleep (short sleep or long sleep), insomnia, and dreams (nightmare distress, the emotional intensity of dreams, and daytime mood affected by dreams) positively related to suicidal behavior (Guo et al., 2017; Karia et al., 2016; S. Y. Kim et al., 2017; Kitagawa et al., 2017; Park et al., 2019; Pfledderer et al., 2019; Sami et al., 2018; Wong et al., 2016) and is an internal factor in suicidal behavior in adolescents.

3.1.2 | External risk factors

External risk factors for suicide in adolescents consist of family factors and social problems. Family factors, namely family history of mental health such as depression and insomnia in the elderly and poor interactions in the family, are factors that have a significant influence on suicidal behavior in adolescents. Maternal severe chronic depression and parental insomnia are associated with suicidal behavior in adolescents (Hammerton et al., 2016; Liu et al., 2015). Poor interactions in the family including quarrels in the family and parenting style are associated with suicidal behavior through mediating the quality of emotional ties in the family, emotional quality in the family is positively related to authoritative parenting style and negatively related to authoritarian and permissive parenting styles (Nunes & Mota, 2017). High level of parental support, understanding parents, and warmth in the family are negatively related to the risk of suicide in adolescents (Kwangu et al., 2017; Li et al., 2016; Liu, Huang, & Liu, 2018; MacKin et al., 2017; Mazaba, Mulenga et al., 2017; Mazaba, Siziya, Mulenga et al., 2017; Mazaba, Siziya, Njunju et al., 2017; Mulenga, Kwangu, Njunju, Mazaba et al., 2017; Siziya et al., 2017).

Social problems that pose a risk of suicidal behavior consist of parental occupational status, state of political regimes, schools, peers, and suicide rates. Parental occupational status (the father was unemployed or self-employed, the father worked casual hours) is positively related to suicidal behavior in adolescents (Chiu et al., 2017; S. H. Kim, Kim et al., 2019). The risk of suicidal behavior in adolescents is related to political regimes. This is related to the policies implemented in each period (Eun, 2019). Low academic achievement, missing class or school, and carrying a weapon to school are positively related to suicidal behavior in adolescents (Davis, Doyle, & Nahar, 2020; S. M. Kim et al., 2015; Njunju et al., 2017; Pfledderer et al., 2019). In addition, the prevalence of suicide behavior was higher in low-income schools compared with middle-income schools (Fang, 2018). Adolescent relationships with peers are also associated with suicidal behavior, adolescents who have little or no close friends and have problems with peers are positively related to suicidal behavior (Balazs et al., 2018; Mulenga, Kwangu, Njunju, Mazaba et al., 2017). Interestingly, for male adolescents, there was a significant positive correlation between suicide rates and suicide ideation and attempted suicide rates in adolescents (Park & Jang, 2018).

3.2 | Protective factors for suicidal behavior in adolescents

In this systematic review, in addition to identifying new internal and external risk factors, this article also identifies protective factors for adolescent suicide behavior. Reframing meaningful life, adequate nutrition (higher fruit intake and higher vegetable intake), and parent–child interactions (family communication, mother/child relationship, and parental monitoring) are potential factors to prevent suicidal behavior in adolescents (Arat, 2017; Lensch, Clements-Nolle, Oman, Lu, & Dominguez, 2018; Lew et al., 2019). Also, positive diversion activities such as the use of smartphones for noble purposes, reading books, and watching movies are protective factors of suicide

behavior. If the use of smartphones for process purposes is a risk factor for suicide, the use of smartphones for social purposes (e.g., messaging and chat, communities, email, and social networks) is a protective factor for suicidal behavior in adolescents (M.-H. Kim, Min et al., 2019). In addition to the protective factors that have been mentioned, reading books and watching films is also one of the protective factors of suicide behavior in adolescents. The more the number of books reads and films watched, the lower the risk of suicide ideation in adolescents (Kasahara-Kiritani et al., 2015). The last factor identified as a protective factor for suicidal behavior in adolescents is faith or religiosity. Private and Organizational Religious Practice is associated with a lower risk of suicidal ideation in adolescents (Cole-Lewis et al., 2016).

4 | DISCUSSIONS

Management of individuals with suicidal behavior focuses on counseling and therapy to help the individual deal with issues that trigger suicidal behavior. Therefore, it is necessary to identify stressors and assess risk factors associated with suicidal behavior in adolescents (Greydanus, 2017). The primary purpose of the systematic review is to identify new risk factors for adolescent suicide behavior. The main results of the systematic review are that risk factors for suicidal behavior are classified as internal and external risk factors. Internal risk factors include poor individual coping, smartphone abuse, nutritional imbalance, menarche, and menstrual problems, poor lifestyle, and disturbed sleep patterns. While, external risk factors for adolescent suicide behavior were mental health history in parents, poor interactions in the family, and social problems.

Adolescents with internal risk factors have a significantly higher risk of demonstrating suicidal behavior. This relationship occurs both directly and indirectly. For example, perfectionism is significantly associated with suicide ideation through moderation of emotional coping and avoidance coping (Abdollahi & Carlbring, 2017). In addition, some researchers argue that adolescents have limited problem-solving abilities, so adolescents are less able to understand the finality of death (Nazeer, 2016). However, specific individual characteristics, such as gratitude/thankfulness, are negatively related to suicidal behavior. Individuals with positive outlooks and acknowledgment that there is an external role that governs positive things in life have a lower risk of committing suicide (Rey et al., 2019).

Adolescent family and social environments are associated with suicidal behavior in adolescents. The relationship between children and people is a protective factor as well as a factor that moderates between maternal severe chronic depression with suicidal ideation in adolescents aged 16 years (Hammerton et al., 2016). Interaction between parents and family is a protective factor of suicide behavior, but family (parents) can also be a risk factor for suicide behavior in adolescents (Cerel, Frey, Maple, & Kinner, 2016; Lensch et al., 2018). Although peers relate to suicidal behavior, the effect of peer support is less influential compared with parent support (MacKin et al., 2017). Uniquely, government policies (political regimes) are related to the risk of suicide in adolescents, for example, policies on college entrance examinations and policies related to suicide prevention (Eun, 2019).

Protective factors are factors that can reduce the likelihood of suicidal behavior (Nazeer, 2016). Suicidal behavior causes an impact, both on individuals and families left behind. Abandoned individuals can experience vulnerabilities triggered by empathy for the deceased, which may lead to long-term traumatic events such as suicide (Seeman, 2015). Also, individuals at risk of suicidal behavior showed lower quality of life (Alves et al., 2016). So it is vital to reduce the likelihood of suicidal behavior by increasing protective factors. Reframing the presence of meaningful life, adequate nutrition (higher fruit intake and higher vegetable intake) and parent–child interactions (family communication, mother/child relationship, and parental monitoring), reading books and watching movies, as well as the level of faith or religiosity in adolescents, are factors protective measures that need to be increased to reduce the risk of suicidal behavior in adolescents.

In this systematic review, research respondents are teenagers aged 10–24 years old; most of the respondents are students from 7th to 12th grade. Based on the results of the systematic review, it is necessary to have a school mental health service that aims to identify risk factors and teach prevention strategies and management of conditions that cause the risk of suicidal behavior in adolescents (Hidalgo-Rasmussen & Martín, 2015). School-wide screening programs using questionnaires and individual interviews can be conducted to identify the risk of adolescent suicide (Nazeer, 2016). In addition, health workers need to teach about developing new life skills, such as communication and expressing emotion, so that adolescents will be able to seek help from health professionals when experiencing problems (Hidalgo-Rasmussen & Martín, 2015).

Several research limitations need to be considered in systematically reviewing this. First, there are thirteen articles (19.7%), which showed almost similar results but located in different sites, so from the 13 articles, the identification results obtained are more or less identical. Also, the majority (90.1%) of the studies were cross-sectional designs, so that it was not possible to determine the causal relationship. Apart from the limitations in this study, the articles discussed in the study were abundant (total articles = 66) and varied so that the risk factors identified in this systematic review could be considered as risk factors that bridge suicide behavior in adolescents.

5 | CONCLUSION

New risk factors for suicidal behavior in adolescents consist of internal and external risk factors that are significantly related to adolescent suicidal behavior. In addition, there are protective risk factors that can reduce the likelihood of suicidal behavior. Health workers need to pay attention to internal and external factors as well as protective factors to prevent suicidal behavior in adolescents, as well as pay attention to the risk factors that have been explained by WHO. Identification of risk factors for suicidal behavior in

adolescents can prevent suicidal behavior early on so that in the end, the prevalence of adolescents with suicide risk can decrease.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Niken A. L. Ati and Mareta D. Paraswati conceived of the presented idea, developed the theory and concept, and carried out the research, and wrote the manuscript with support from all authors. Heni D. Windarwati verified the method and supervised the finding of this study. All authors discussed the results and contributed to the final manuscript. The manuscript has been seen and approved by all authors.

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