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Self-injury and suicide among people living with HIV/AIDS in China: a systematic review and meta-analysis

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Abstract

Background The prevalence of self-injury and suicide is higher than the general population of people living with HIV/AIDS (PLWHA). However, the results reported in existing studies are highly variable in China. The purpose of this systematic review and meta-analysis was to synthesize the currently available high-quality evidence to explore the prevalence and influence factors of self-injury and suicide among PLWHA in China.

Method We retrieve literature written in Chinese and English through databases such as PubMed, Embase, Web of Science, Cochrane Library, SinoMed, CNKI, WanFang Database, and CQVIP from inception to 1 September 2022. Sata 16.0 software was used for analysis.

Results A total of 28 studies were included with a sample size of 1,433,971 and had a satisfactory quality score of ≥ 5. The prevalence among PLWHA in China were 30% for suicidal ideation (SI), 5% for suicide attempt (SA), 8% for suicide plan (SP), 7% for attempted suicide (AS), and 3‰ for completed suicide. High stigma (OR = 2.94, 95%CI: 1.90 – 4.57), depression (OR, 3.17; 95%CI, 2.20 – 4.57), anxiety (OR, 3.06; 95%CI, 2.23 – 4.20), low self-esteem (OR, 3.82, 95%CI, 2.22 – 6.57), high HIV related stress (OR, 2.53; 95%CI, 1.36 – 4.72), and unemployment (OR, 2.50; 95%CI, 1.51 – 4.15) are risk factors for SI; high social support (OR, 0.61; 95%CI, 0.44 – 0.84) and spouse infected with HIV (OR, 0.39; 95%CI, 0.21 – 0.74) are protective factors for SI; depression (OR, 1.62; 95%CI, 1.24 – 2.13), high aggression (OR, 4.66; 95%CI, 2.59 – 8.39), and more negative life events (OR, 2.51; 95%CI, 1.47 – 4.29) are risk factors for AS; high level of education (OR, 1.31; 95%CI, 1.21 – 1.43) is risk factor for CS.

Conclusion Figures indicate that approximately one-third of PLWHA had suicidal ideation, and three out of 1,000 completed suicide in China. Positive events are protective factors for self-injury and suicide among PLWHA, while negative events are risk factors. This suggests that psychosocial support and risk assessment should be integrated into the care of PLWHA.

Keywords HIV/AIDS, Self-injury, Suicide, Prevalence, Risk factors, Meta-analysis

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Background

Self-injurious thoughts and behaviors (SITBs) remain a significant public health issue globally, a concern that has persisted since Emile Durkheim published 'Le Suicide' in 1897. These behaviors encompass suicide ideation, suicide attempt, suicide plan, completed suicide, and nonsuicidal self-injury (NSSI). Currently, nearly 800,000 people die from suicide each year worldwide [1], with China accounting for approximately 15% of these deaths [2].

The WHO estimates that approximately 38.4 million people were living with HIV/AIDS globally at the end of 2021 [3]. With the advent of antiviral therapy, the cumulative survival rate of people living with HIV/AIDS (PLWHA) has significantly increased. Thanks to the joint efforts of the United Nations Programme on HIV and AIDS and the WHO, HIV infection has been effectively controlled. However, the psychosocial burden has not been effectively relieved. An analysis of data from more than 185,000 adults living with HIV worldwide by Pennsylvania State University College of Medicine found that PLWHA not only are more likely to experience suicidal ideation than the general population, but they are also 100 times more likely to die by suicide [4].

Among the available studies on SITBs in PLWHA, suicidal ideation has garnered the most attention. A meta-analysis encompassing 32,818 individuals from 15 countries reported a prevalence of suicidal ideation among PLWHA at 20.9% [5]. In China, the prevalence of suicidal ideation varies widely, ranging from 5.9 to 54.23% [6, 7]. For instance, in 2019, separate studies conducted in Guangzhou and Jiangxi reported different prevalences (17.4% vs. 40%), attributed to geographical differences [8, 9].

Suicide does not happen suddenly; but rather is a synergistic process involving biological, behavioral, and social factors. However, the exact etiology of suicide remains unclear, as it varies across different ages, personalities, and circumstances. Numerous factors, such as HIV-related stigma, depression, low self-esteem, and previous psychiatric history, have been identified as contributing to the heightened risk of self-injury or suicide among PLWHA compared to the general population [10–12]. Whereas, some contrary results have been observed. For instance, it is generally believed that the probability of self-injury or suicide is higher in adolescents than in other age groups [11, 13], but others have shown that the risk of suicide increases with age [14, 15].

While several studies have reported the prevalence and influencing factors of self-injury or suicide among PLWHA in China, they are influenced to a certain extent by the limitations of various research methods, resulting in significant inconsistencies and variations. Hence, the current systematic review and meta-analysis aims to explore the pooled prevalence and influencing factors of self-injury or suicide among PLWHA in China. This endeavor will complement the existing evidence base, and assist policy makers and public health service providers in developing rational and effective prevention and interventions.

Method

The study protocol has been registered in PROSPERO (CRD42022356641) and conforms to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines.

Search strategy

We conducted a comprehensive search of Chinese and English literature published from the inception of each database up to September 1, 2022. English databases included Medline (via PubMed), Embase, Web of Science and Cochrane Library; Chinese databases included the Chinese biomedical literature service system (SinoMed), China National Knowledge Infrastructure (CNKI), WanFang Database, and China Science and Technology Journal Database (CQVIP), which hosts the most comprehensive collection of Chinese academic journals and provides access to a vast number of full-text articles. Medical Subject Headings and Entry Terms were used in combination, employing Boolean logical operators to combine search terms. Key terms included HIV, acquired immunodeficiency syndrome, self-injurious behavior, suicide, and geographical location within mainland China, Hong Kong, Macau and Taiwan. A detailed search strategy is outlined in Additional Table 1. Each retrieval step was performed by two researchers (XP.H. and ZQ.L.) independently. In case of disagreement between the two researchers, a third party (Senior researcher, XC.W.), who oversaw the search strategy, will participate in discussion and resolve the inconsistencies.

Selection criteria and data extraction

Literature screening and data extraction were carried out independently by two researchers (XP.H. and ZQ.L.) according to predefined inclusion and exclusion criteria. Articles included in the final analysis met the following criteria: (1) study subjects were Chinese PLWHA; (2) the study focused on the prevalence or influencing factors of self-injury or suicide, and reported odds ratios (OR) and 95% confidence intervals (95%CI) for these factors; and (3) the study design was cross-sectional, case-control, or cohort. Exclusion criteria were as follows: (1) sample size < 30; (2) abstracts, reviews, conference literature, or case report; (3) full text unavailable, incomplete information, or the data cannot be extracted; and (4) duplicate publications.

A standardized information extraction table was created. Two researchers (XP.H. and ZQ.L.) independently extracted all data, which were cross-checked for consistency. Disagreements were resolved through discussion or with the involvement of a third researcher (Senior researcher, XC.W.). Data collection included: author, year of publication, study type, region, sample size, male proportion, mean or median age, prevalence, and influencing factors (Additional Table 2).

Quality assessment

The article's quality was independently assessed by two researchers (W.Z. and XM.F.). Case-control and cohort studies were evaluted using the Newcastle-Ottawa Scale (NOS) [16, 17], while cross-sectional studies were assessed using the observational study evaluation criteria [18] recommended by the Agency for Healthcare Research and Quality (AHRQ) to gauge bias risk (Additional Table 2). A total score of five or higher indicates satisfactory quality.

Statistical analysis

Stata 16.0 software was used for analysis. Meta-analysis data included prevalence, OR and, 95%CI. Prevalence of self-injury and suicide was calculated by dividing the number of screen-positive participants by the total sample size and multiplying by 100. OR=1 indicated no association, OR>1 indicated a risk factor. Study heterogeneity was assessed using I-squared (I^2) values and Q test; $I^2>50\%$ indicated substantial heterogeneity [19], using a random effects model [20]. Sensitivity analyses were conducted using a study-by-study exclusion approach; univariate meta-regression and subgroup analysis based on study subject characteristics to explore potential sources of heterogeneity. Publication bias was assessed using funnel plots for rough qualitative analysis and Egger test for quantitatively assessment, with $p<0.05$ indicating statistically significant publication bias.

Results

Search results

The literature selection process is depicted in the PRISMA flow chart (Fig. 1). A total of 949 articles were retrieved from the database, comprising 407 English and 542 Chinese. After removing 215 duplicates and reviewing titles, abstracts and full texts according to the inclusion and exclusion criteria, 28 studies were finally included [6–9, 14, 15, 21–42]. These comprised 16 English-language and 12 Chinese-language literatures, totaling 1,433,971 cases.

Characteristics of studies

Among the final 28 included studies, there were 4 cohort studies, 3 case-control studies, and 21 cross-sectional studies. Half of these studies were published between 2011 and 2020, with 57.14% published in English. The majority (92.86%) were conducted in mainland China, and the primary assessment tool used was CIDI (57.14%) (Table 1). Every study received a quality score of at least 5, indicating satisfactory quality (Additional Table 3). Suicidal ideation was the primary focus in 29% of these studies, with 23 studies relating to it. Only 4 studies examined completed suicide specifically (Fig. 2).

Pooled prevalence of suicide in PLWHA

The pooled prevalence of suicidal ideation in PLWHA was 30% (Fig. 3), suicide attempt, suicide plan, attempted suicide, and completed suicide were 5%, 8%, 7%, and 3‰, respectively (Additional Fig. 1). The data of completed suicide were merged as a percentage and presented as a thousandth rate.

We performed meta-regression with sample size, year of publication, region, mean or median age, and male proportion as variables to explore the possible sources of heterogeneity. The results showed that the pooled prevalence of suicidal ideation in PLWHA was statistically different in sample size>400 (z = -2.39, p=0.017). Subgroup analysis revealed a higher prevalence of suicidal ideation in studies with sample sizes<400 compared to those with sample sizes≥400 (34% vs. 26%), but not the source of heterogeneity. Significant difference was also found in the pooled prevalence of suicide attempt (z = -4.56, $p<0.001$) and attempted suicide (z = -6.41, $p<0.001$) based on male proportion, subgroup analysis identified male proportion as a source of heterogeneity. Regarding completed suicide, there were statistically significant differences based on region (z=4.48, $p<0.001$) and male proportion (z=5.45, $p<0.001$). Subgroup analysis showed that while region and male proportion were not the source of heterogeneity, but may be factors that modulate heterogeneity. (Additional Fig. 2)

Influence factor of suicide in PLWHA

A total of 16 studies covered influencing factors related to suicide ideation, with 2 studies focusing on attempted suicide, and 2 on completed suicide. Meta-analysis showed that among PLWHA, high stigma (OR, 2.94; 95%CI, 1.90–4.57), depression (OR, 3.17; 95%CI, 2.20–4.57), anxiety (OR, 3.06; 95%CI, 2.23–4.20), low self-esteem (OR, 3.82; 95%CI, 2.22–6.57), high HIV related stress (OR, 2.53; 95%CI, 1.36–4.72), and unemployment (OR, 2.50; 95%CI, 1.51–4.15) are risk factors for suicide ideation; while high social support (OR, 0.61; 95%CI, 0.44–0.84) and spouse infected with HIV (OR, 0.39; 95%CI, 0.21–0.74) are protective factors against suicide ideation. Depression (OR, 1.62; 95%CI, 1.24–2.13), high aggression (OR, 4.66; 95%CI, 2.59–8.39), and more negative life events (OR, 2.51;

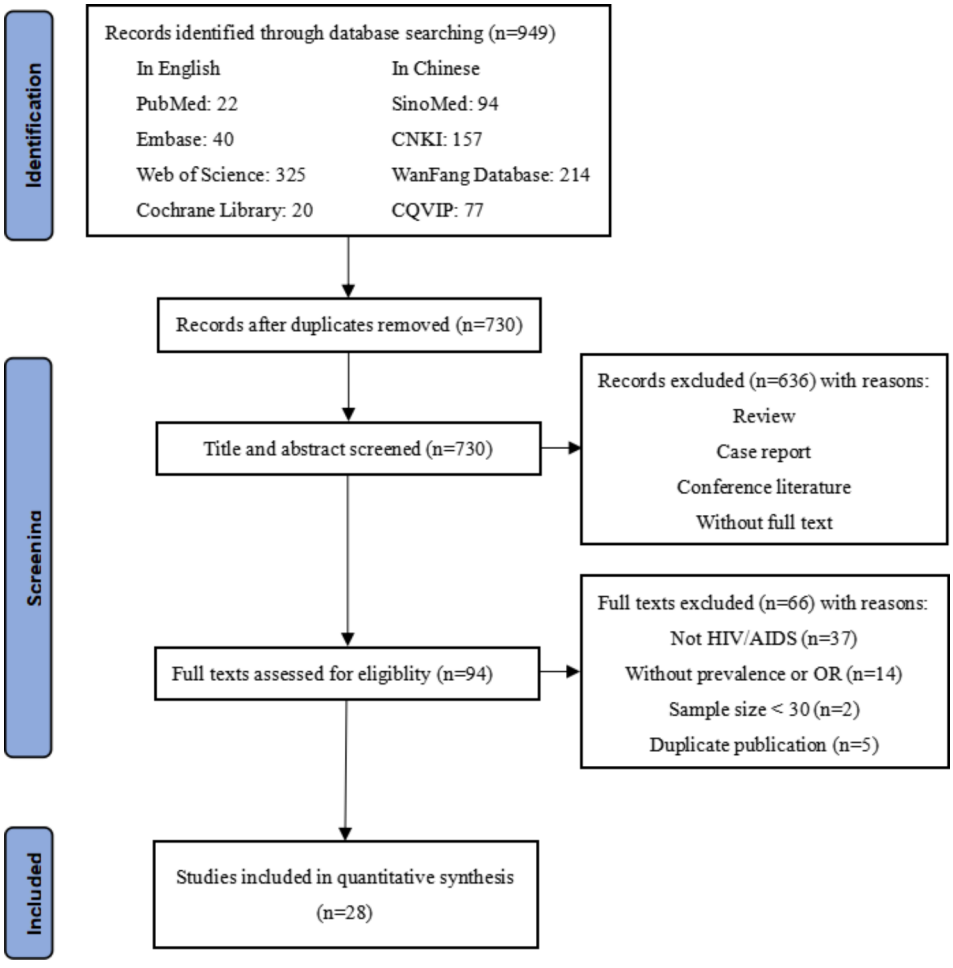

Fig. 1 PRISMA flow chart of the study

95%CI, 1.47−4.29) are risk factors for attempted suicide. Elder (OR=1.40, 95%CI: 0.81−2.40) and high level of education (OR=1.31, 95%CI: 1.21−1.43) are risk factors for completed suicide (Table 2).

Sensitivity analysis

Sensitivity analysis results of the pooled prevalence showed that except for completed suicide (the results are somewhat unreliable) (Fig. 4), there was no significant change after deleting any of the references, and the results were stable (Additional Fig. 3). The results of the sensitivity analysis of influencing factors for suicidal ideation also showed good stability (Table 3).

Publication bias

The funnel plot results for indicators with more than 10 studies, such as the prevalence of suicidal ideation and its influencing factor depression, suggested potential publication bias(Fig. 5). However, Egger test results demonstrated that prevalence of suicidal ideation (t=1.59, p=0.127), suicide attempt (t=2.81, p=0.067), suicide plan (t=2.05, p=0.110), attempted suicide (t=2.33, p=0.068), and completed suicide (t = -0.05, p=0.961) had no publication bias. Egger test results of the influencing factors of suicidal ideation indicated that anxiety (t=1.72, p=0.228) and high stigma (t = -0.86, p=0.438) had no publication bias; depression (t=2.44, p=0.041) and high social support (t = -4.47, p=0.046) may have publication bias.

Discussion

Owing to social discrimination and prejudice, stigma, and economic burden, PLWHA experience significant psychological pressure, often leading to anxiety, depression, and sleep disorders [43]. These mental health challenges can have profound negative effects and may even result in extreme behaviors [44]. Research indicates that the prevalence of self-injury and suicide among PLWHA is higher compared to the general population [45], with approximately 20% of PLWHA engaging in deliberate self-harm [46]. Among women diagnosed with HIV, 26% have reported suicide attempt [47]. Although, studies have shown that the prevalence of suicidal ideation among PLWHA is around 35%, and identified depression,

Table 1 Characteristics of studies included in the meta-analysis

Items	Number	Percentage
Total number of studies	28	
Language written		
Chinese	12	42.86
English	16	57.14
Region		
Chinese Mainland	26	92.86
Hong Kong, Macau or Taiwan	2	7.14
Publication year		
2000 ~ 2010	8	28.57
2011 ~ 2020	14	50.00
2021~	6	21.43
Sample size		
< 400	12	42.86
≥ 400	16	57.14
Research design		
Cohort study	4	14.29
Case-control Study	3	10.71
Cross-sectional Study	21	75.00
Assessment Tool		
ICD-10	2	7.14
CIDI	16	57.14
BDI	1	3.57
BSRS-5	2	7.14
SIOSS	1	3.57
SCID-I/P	3	10.72
BSSI	3	10.72

Note ICD-10, International Classification of Diseases 10th edition; CIDI, Comprehensive International Diagnostic Interview; BDI, Beck Depression Inventory; BSRS-5, The five-item Brief Symptom Rating Scale; SIOSS, Self-rating Idea of Suicide Scale; SCID-I/P, Structured Clinical Interview for DSM-IV-TR Axis I Disorders-Patient Edition; BSSI, Beck Scale for Suiciden Ideation

perceived discrimination, low social support, anxiety, and low self-esteem as risk factors [48], there remains significant variability and inconsistency in reported findings across these primary studies.

A total of 28 studies were included in this meta-analysis, all with quality assessments above 5, and a combined sample size of 1,433,971. To a certain extent, it shows the current prevalence and influencing factors of suicide in PLWHA in China. Some of the included studies were highly heterogeneous (I^2, 0−98.8%), with a certain degree of publication bias.

Meta-analysis revealed that the prevalence of suicidal ideation among PLWHA in China was 30%, which is lower than the findings reported by LiuY et al. [48]. This difference may be attributed to variations in the characteristics of the included population, sample size, and study types. The incidence of suicide attempt was 5%, lower than the 7.1% reported by Gizachew KD et al. [49] and similar to the 4.23% reported by ZhangY et al. [50], which may be influenced by different countries and study subjects. Suicide plan were reported at 8%, higher than that reported by RuFX et al. [51], likely due to differences in research subjects and retrieval strategies. The prevalence of attempted suicide, completed suicide were 7% and 3‰, respectively, is similar to the findings of TsaiY et al. [52]. Variations may stem from differences in countries, search strategies, and study years.

High stigma, depression, anxiety, low self-esteem, high HIV related stress, and unemployment were identified as risk factors for suicidal ideation among PLWHA. This could be due to behavioral changes and psychosocial factors mediated after HIV diagnosis [53]. Conversely, high social support and spouse infected with HIV were

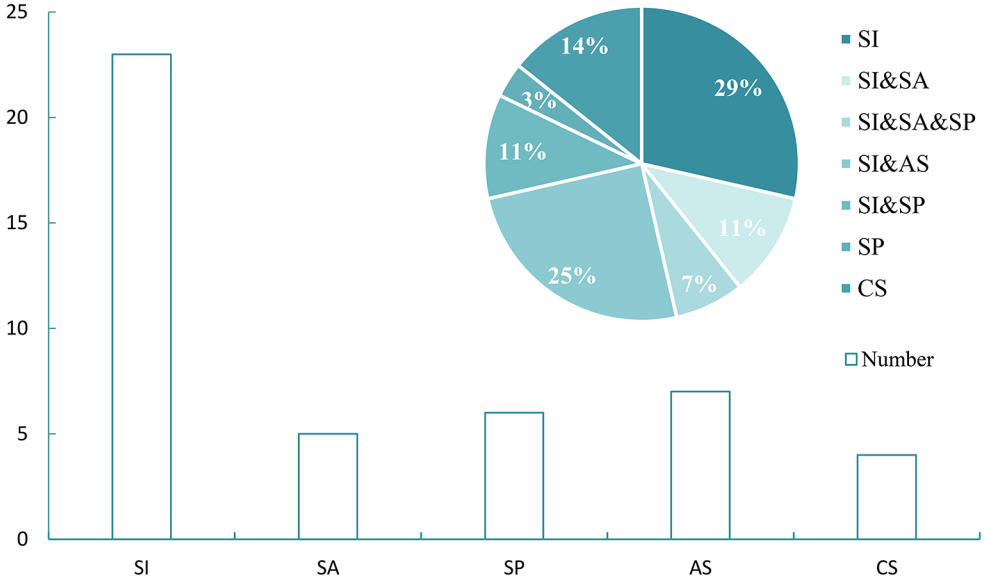

Fig. 2 Distribution of research topics. Note SI, suicidal ideation; SA, suicide attempt; SP, suicide plan; AS, attempted suicide; CS, completed suicide

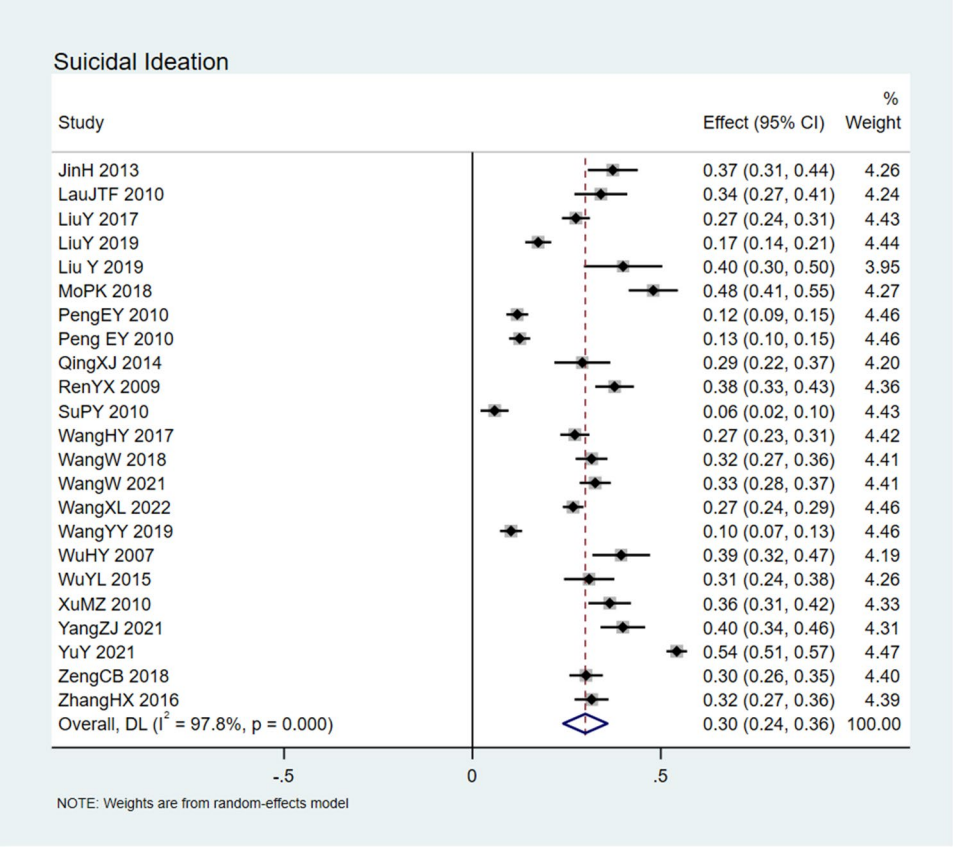

Fig. 3 Forest plots of Suicide Ideation in PLWHA

Table 2 Influence factor of suicide in PLWHA

Item	Influence Factor	Study	Heterogeneity Test		Effect Model	Meta Analysis	
			I2/%	*P*		OR(95%CI)	*P*
SI	Stigma[a]	6	82.1	< 0.001	Random	2.94(1.90 – 4.57)	< 0.001
	Depression[b]	10	66.0	0.002	Random	3.17(2.20 – 4.57)	< 0.001
	Anxiety[c]	4	35.7	0.198	Fixed	3.06(2.23 – 4.20)	< 0.001
	Social Support[d]	4	73.7	0.010	Random	0.61(0.44 – 0.84)	0.002
	Self-esteem[33, 37]	2	0	0.739	Fixed	3.82(2.22 – 6.57)	< 0.001
	HIV related stress[e]	2	66.9	0.082	Random	2.53(1.36 – 4.72)	0.003
	Unemployment[f]	2	4.8	0.305	Fixed	2.50(1.51 – 4.15)	< 0.001
	Spouse infection status[g]	2	0	0.432	Fixed	0.39(0.21 – 0.74)	0.004
AS	Depression[31,38]	2	0	0.873	Fixed	1.62(1.24 – 2.13)	< 0.001
	Aggression[31,38]	2	0	0.701	Fixed	4.66(2.59 – 8.39)	< 0.001
	Negative life events[h]	2	0	0.702	Fxied	2.51(1.47 – 4.29)	0.001
CS	Age[14,42]	2	92.4	< 0.001	Random	1.40(0.81 – 2.40)	0.226
	Education[14,42]	2	6.5	0.301	Fixed	1.31(1.21 – 1.43)	< 0.001

Note a, Reference No. 7,8,33,34,37,39; b, Reference No. 8,23,24,29,31,33,34,36,37,39; c, Reference No. 8,32,34,37; d, Reference No. 7,8,25,39; e, Reference No. 25,34; f, Reference No. 15,30; g, Reference No. 8,36; h, Reference No. 31,38; SI, suicidal ideation; AS, attempted suicide; CS, completed suicide

protective factors for suicidal ideation in PLWHA, this could be attributed to the heightened psychological stress from stigma experienced by PLWHA compared to the general population, necessitating increased social support and comfort from partners [54]. Depression, high aggression, and experiencing more negative life events were considered as risk factors for attempted suicide among PLWHA. The accumulation of negative life events alongside HIV infection likely acts as stressors leading to depression and heightened aggression. Individuals with high aggression are reported to be 3–4 times more likely to attempt suicide compared to those with

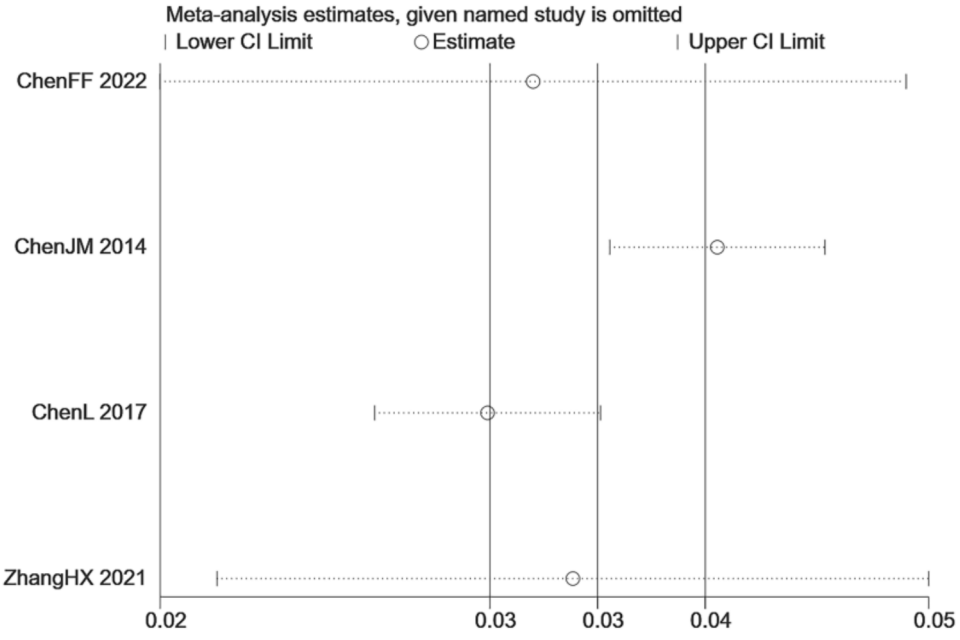

Fig. 4 Sensitivity analysis of pooling prevalence of Completed Suicide in PLWHA

Table 3 Sensitivity analysis of influence factor of suicidal ideation in PLWHA

Influence Factor	Study omitted	Estimate	95% CI	
Stigma	YuY 2021 [7]	2.38	1.85	3.05
	YangZJ 2021 [39]	2.73	1.68	4.45
	LiuY 2019 [8]	3.02	1.75	5.21
	WangW 2018 [33]	3.19	1.96	5.20
	WuYL 2015 [37]	3.04	1.86	4.96
	WangXL 2022 [34]	3.23	2.02	5.18
Depression	YangZJ 2021 [39]	3.33	2.20	5.02
	LiuY 2019 [8]	2.52	1.97	3.23
	RenYX 2009 [31]	3.17	2.11	4.76
	WuHY 2007 [36]	3.51	2.48	4.95
	WangW 2018 [33]	3.30	2.16	5.04
	WuYL 2015 [37]	3.26	2.19	4.87
	JinH 2013 [23]	3.05	2.10	4.45
	WangXL 2022 [34]	3.34	2.17	5.14
	LauJTF 2010 [24]	3.07	2.12	4.44
	Peng EY 2010 [29]	3.21	2.15	4.79
Anxiety	LiuY 2019 [8]	2.75	1.97	3.83
	WangHY 2017 [32]	3.07	2.13	4.41
	WuYL 2015 [37]	3.13	2.22	4.42
	WangXL 2022 [34]	3.60	2.28	5.67
Social Support	YuY 2021 [7]	0.58	0.35	0.96
	YangZJ 2021 [39]	0.66	0.49	0.89
	LiuY 2019 [8]	0.55	0.43	0.68
	LiuY 2017 [25]	0.63	0.44	0.90

lower aggression levels [55]. Older age and higher levels of education are risk factors for completed suicide among PLWHA. Increased age often correlates with declining physical function and feelings of loneliness, which may contribute to suicide among the elderly [56]. This underscores the importance of integrating psychological and social support into the diagnosis, treatment, and prevention systems for PLWHA to mitigate their psychological burden and mental health challenges, thereby preventing suicides.

We conducted subgroup analysis based on sample size, revealing the highest prevalence (34%) of suicidal ideation among studies with sample sizes < 400, and the lowest prevalence (26%) among those with sample sizes ≥ 400. This difference may be explained by the phenomenon where sample correlations converge to population values as sample size increases, whereas smaller samples may exhibit instability [57]. Furthermore, subgroup analysis indicated lower prevalence of suicide attempt and attempted suicide in studies with a higher proportion of men, possibly due to greater stress tolerance observed in men compared to women [36]. For instance, the incidence of repeated self-injury among Chinese adolescents is approximately 22.1%, with woman being 1.5 times more likely to repeat self-injury compared to men [58]. While in studies of WangW et al. [33] and WangXL et al. [34], did not find significant gender differences.

Furthermore, YangZJ et al. [39] pointed out that age > 30 years old was a protective factor for suicidal ideation in PLWHA, whereas other studies on the contrary believed that this age group may increase suicidal ideation risk by 2.5 times [15]. Similarly, WangW et al. [15] identified higher education levels as protective against suicidal ideation among PLWHA, but studies by LauJTF et al. [24] and YangZJ et al. [39] found no significant differences in suicidal ideation distribution based on

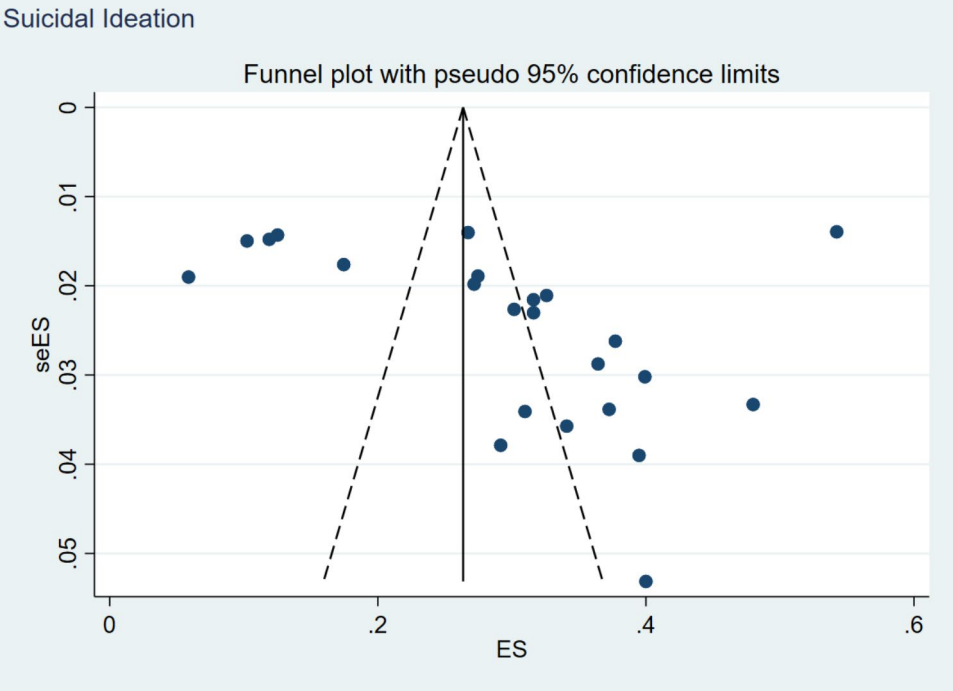

Fig. 5 Funnel plot of prevalence of SI in PLWHA

educational attainment. These discrepancies highlight the need for further research and exploration. Living alone appears to influence suicidal ideation development in China, particularly among the elderly, although there is limited literature specifically addressing this factor in PLWHA [30], warranting additional investigation. However, there is relatively scant research on risk factor for suicide attempt, suicide plan, attempted suicide and completed suicide among PLWHA in China. This scarcity may be attributed to improved HIV diagnosis and detection capabilities following the implementation of China's AIDS prevention and control policies, such as the "Four Frees and One Care" initiative. These policies have enhanced timely treatment and reduced the economic burden on families affected by HIV, thereby alleviating mental pressures and potentially lowering suicide incidence [59].

In the PLWHA population in China, research on self-injury is limited and receives relatively little attention. In Anhui, China, PLWHA who were paid to donate blood had a self-injury probability approximately 2.8 times higher than the general population [6]. Additionally, about 31% of AIDS patients in compulsory wards experience self-injurious behavior [60]. However, these findings alone are insufficient to fully understand the prevalence of self-injury among PLWHA in China. The hidden nature of self-injury, reluctance of individuals to report such behaviors, and inadequate detection contribute to underreporting [61]. Furthermore, clinical healthcare providers often lack necessary professional training, leading to insufficient assessment and attention towards self-injurious behaviors. Another contributing factor is the lack of a strict unified concept of self-injury and suicide, with varying perspectives among different disciplines and scholars. Studies have noted confusion and difficulty in distinguishing between self-injury and suicide attempt [62, 63], which further limits research in this area. Hence, Chinese scholars are urged to prioritize research on self-injury among PLWHA, exploring potential social, psychological, and biological factors affecting this group. Timely interventions are crucial to interrupting the progression from self-injury to suicide in this population.

SITBs significantly impact PLWHA, their families, and communities. In this systematic review and meta-analysis of high-quality evidence, we found that the prevalence of self-injury and suicide among Chinese PLWHA is relatively high, and its influencing factors can be summarised into three categories, namely, the individual's psychological adjustment ability, family and social support, and the living environment's tolerance of AIDS. Given the above findings, we believe that to improve the current situation, we should do the following: Firstly, correctly guiding PLWHA to accept their condition is crucial to enhancing their psychological adjustment. Encouraging them to join AIDS support groups, learn the basics of AIDS, and share their experiences with other patients can eliminate misunderstandings and fears of the disease, and reduce the sense of loneliness and helplessness. Secondly, encouraging participation in social activities and volunteerism

can mitigate social isolation, boost self-esteem, and foster a stronger sense of social identity and support. Thirdly, combating stigma and discrimination through education and community initiatives is essential. Promoting greater social inclusion and support networks for PLWHA can reduce their vulnerability to SITBs. Finally, enhancing healthcare professionals' training in identifying and managing mental health issues among PLWHA is crucial. This will improve early detection and targeted intervention for high-risk individuals, ensuring timely support and care. By implementing these strategies, we can improve the well-being and mental health outcomes for PLWHA in China.

This study has several limitations. Firstly, the sample size of the included studies varied from 85 to 763,287, and there were many diagnostic tools used, including BSSI, CIDI, SIOSS, SCID-I/P, ICD-10, BDI and BSRS-5, etc., which showed significant differences among the studies. Secondly, sample representation, participants' basic characteristics, and differences in study areas may be the factors that affect the results. Moreover, the types of literature included in this study were cross-sectional, case-control and cohort studies, which may be limited in the strength of the argument. To overcome these limitations, we conducted a meta-analysis to explore the sources of heterogeneity among the results. Moving forward, there is a need for future studies with large sample sizes, minimal baseline heterogeneity, balanced demographic characteristics, and multi-center collaboration to further investigate the incidence and influencing factors of self-injury and suicide among PLWHA in China. This will provide objective, evidence-based data to guide healthcare providers in formulating and implementing effective interventions.

Conclusions

Figures indicate that approximately one-third of PLWHA experience suicidal ideation, and three out of every 1,000 completed suicide in China. Positive factors such as high social support and self-esteem serve as protective factors against self-injury and suicide among PLWHA. Conversely, negative factors including high stigma, depression, anxiety, low self-esteem, high HIV-related stress, unemployment, high aggression, and exposure to negative life events are associated with increased risk. These findings underscore the importance of integrating psychosocial support and comprehensive risk assessment into the care of PLWHA.

Abbreviations

PLWHA	People living with HIV/AIDS
SinoMed	Chinese includes Chinese biomedical literature service system
CNKI	China National Knowledge Infrastructure
CQVIP	China Science and Technology Journal Database
SI	Suicidal ideation
SA	Suicide attempt
SP	Suicide plan
AS	Attempted suicide
CS	Completed suicide
OR	Odds ratios
95%CI	95% confidence intervals
SITBs	Self-injurious thoughts and behaviors
NSSI	Nonsuicidal self-injury
WHO	World Health Organization
NOS	Newcastle-Ottawa Scale
AHRQ	Agency for Healthcare Research and Quality
I^2	I-squared
ICD-10	International Classification of Diseases 10th edition
CIDI	Comprehensive International Diagnostic Interview
BDI	Beck Depression Inventory
BSRS-5	The five-item Brief Symptom Rating Scale
SIOSS	Self-rating Idea of Suicide Scale
SCID-I/P	Structured Clinical Interview for DSM-IV-TR Axis I Disorders-Patient Edition
BSSI	Beck Scale for Suiciden Ideation

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Author contributions

All authors reviewed and approved the study. XP.H. : Methodology, literature search, data collection and analysis, Writing - Original draft preparation; ZQ.L. : literature search, data collection and analysis; W.Z. : duplicate assessment of study bias; XM. F. : literature search, data collection and analysis; XC.W. : Methodology, Supervision, Writing - Review and editing, Funding; ZL.J. : Supervision, Writing - Review, Funding.

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Data availability

All extracted data are published studies, the original data are available in the paper, and the data are not blocked or restricted. Supplementary data to this article can be found online. Additional data will be available upon requests to Xiaoping Huang (shoppingh07@163.com).

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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