Journal of Health Promotion and Behavior (2025), 10(04): 421-437
Masters Program in Public Health, Universitas Sebelas Maret

Meta-Analysis
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Social Support, Depression, and Anxiety as Predictors of Suicidal Ideation in People Living with HIV/AIDS: A Meta-Analysis

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Received: June 10, 2025; Accepted: June 28, 2025; Available online: October 16, 2025

ABSTRACT

Background: Acquired Immune Deficiency Syndrome (AIDS) is a disease caused by the Human Immunodeficiency Virus (HIV). People living with HIV/AIDS (PLWHA) are 7 to 36 times more likely to experience suicidal ideation compared to the general population. Suicidal ideation among PLWHA is closely correlated with depression and anxiety. Social support plays a crucial role in helping individuals cope with HIV, serving as a direct protective factor for psychosocial health. This meta-analysis aims to examine the relationship between social support, depression, and anxiety with suicidal ideation among people living with HIV/AIDS (PLWHA)

Subjects and Method: The meta-analysis was conducted using the PICO framework. Population: people living with HIV/AIDS (PLWHA). Intervention: high social support, presence of depression, and anxiety. Comparison: low social support, absence of depression, and absence of anxiety. Outcome: suicidal ideation. Research data were obtained from the Google Scholar, PubMed, and ScienceDirect databases. The keywords used were "social support" OR "depression" OR "anxiety" AND "suicidal ideation" AND "HIV/AIDS" OR "PLWHA." The inclusion criteria included cross-sectional studies published between 2014 and 2024. Data analysis was performed using RevMan version 5.4.

Results: The meta-analysis included 19 primary studies conducted in Indonesia, South Korea, China, Ethiopia, Uganda, Nigeria, South Africa, and the United States, with a total sample size of 11,166 participants. PLWHA residing in communities with high social support had 0.65 times lower odds of suicidal ideation compared to those with low social support (aOR= 0.65; 95% CI= 0.57 to 0.74; p<0.001). PLWHA experiencing depression had a 3.21 times higher risk of suicidal ideation compared to those without depression (aOR= 3.21; 95% CI= 2.07 to 4.99; p <0.001). PLWHA with anxiety were 1.67 times more likely to experience suicidal ideation than those without anxiety (aOR= 1.67; 95% CI= 1.29 to 2.18; p= 0.001).

Conclusion: Depression and anxiety increase the risk of suicidal ideation, whereas high social support reduces the risk of suicidal ideation among people living with HIV/AIDS.

Keywords: social support, depression, anxiety, people living with HIV/AIDS, suicidal ideation

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Cite this as:
Nugraheni AP, Zartika M, Ningrum AL, Murti B, Ayuningrum IY (2025). Social Support, Depression, and Anxiety as Predictors of Suicidal Ideation in People Living with HIV/AIDS: A Meta-Analysis. *J Health Promot Behav*. 10(04): 421-437. https://doi.org/10.26911/thejhpb.2025.10.04.04.

BACKGROUND

Acquired Immune Deficiency Syndrome (AIDS) is one of the diseases caused by the Human Immunodeficiency Virus (HIV). This viral infection progressively weakens the immune system, leading to immunodeficiency (UNAIDS, 2024). HIV/AIDS remains a major global public health issue. According to a report from the World Health Organization (WHO, 2023), it is estimated that 630,000 people died from HIV-related causes, 1.3 million people acquired new HIV infections, and approximately 39.9 million individuals were living with HIV/AIDS worldwide, with 64% of them residing in the African region.

Antiretroviral therapy (ART) can improve the life expectancy of people living with HIV/AIDS (PLWHA); however, ART only works by inhibiting HIV replication and does not completely eliminate the virus (Supriyatni et al., 2023). In addition, ART treatment may have negative impacts on PLWHA, including mental health disturbances and other adverse side effects, which may contribute to the development of suicidal ideation (Yu et al., 2023). Several epidemiological studies have found that PLWHA have a 7 to 36 times higher risk of experiencing suicidal ideation and suicide attempts compared to the general population. Suicidal behavior among PLWHA is strongly correlated with poor mental health status (Pei et al., 2021).

Mental and psychosocial disorders are major factors contributing to HIV transmission across populations, increasing the risk of infection by four to ten times. Mental health problems may elevate the risk of HIV transmission through both direct and indirect pathways (Remien et al., 2019). People living with HIV/AIDS (PLWHA) often experience substantial stress related to their condition, including stigma, discrimination, economic hardship, medication side effects, and inadequate social or family support. These factors collectively exert a significant negative impact on mental health, leading to conditions such as depression, anxiety, stress, and other psychological disturbances (Bagheri et al., 2021).

HIV infection is often associated with an increased risk of suicidal ideation, particularly after individuals are first diagnosed as HIV-positive (Pelton et al., 2021). Social support plays a vital role in helping people living with HIV/AIDS (PLWHA) cope with the psychological and social challenges of the disease. It acts as a protective factor for psychosocial well-being by providing different types of assistance, such as emotional support (empathy, care, and encouragement), informational support (guidance and advice), and instrumental support (tangible help or resources) (Casale et al., 2019).

A cross-sectional study conducted in Ethiopia reported that mental disorders and poor social support were significant predictors of suicidal ideation among PLWHA (Tamirat et al., 2021). Similarly, studies in China by Yu et al. (2023) and Wang et al. (2022) demonstrated that anxiety and depression were strongly associated with an increased risk of suicidal ideation, whereas social support served as a mediating factor between anxiety, depression, and suicidal ideation among PLWHA. In contrast, a meta-analysis by Armoon et al. (2022) revealed a negative correlation between HIV/AIDS-related stigma, anxiety, depression, and social support. Nonetheless, social support may function as a protective factor against the negative impact of HIV/ AIDS-related stigma among PLWHA

Based on previous research examining the relationships among stigma, social support, depression, and anxiety in influencing suicidal ideation among PLWHA, the

researchers were motivated to conduct a meta-analysis focusing on the direct effects of these factors. The purpose of this study is to assess and analyze the magnitude of suicidal ideation and the relationships between social support, depression, and anxiety with suicidal ideation in the absence of stigma among individuals living with HIV/AIDS.

SUBJECTS AND METHOD

1. Study design

This study employed a systematic review and meta-analysis approach, conducted in accordance with the PRISMA guidelines and utilizing the PICO framework. Population: people living with HIV/AIDS. Intervention: high social support, depression, and anxiety. Comparison: low social support, absence of depression, and absence of anxiety. Outcome: suicidal ideation. Relevant articles were collected from databases including Google Scholar, PubMed, and ScienceDirect. The literature search was conducted using the following keywords: (("anxiety"[MeSH Terms] OR "anxiety"[All Fields] OR "depression"[MeSH Terms] OR "depressive disorder"[MeSH Terms] OR "depression" [All Fields]) AND ("social support"[MeSH Terms] OR "social support"[All Fields] OR "psychosocial support"[All Fields]) AND ("HIV"[MeSH Terms] OR "HIV"[All Fields] OR "human immunodeficiency virus"[All Fields] OR "HIV infections"[MeSH Terms] OR "acquired immunodeficiency syndrome" [MeSH Terms] OR "AIDS"[All Fields] OR "people living with HIV"[All Fields] OR "PLWHA"[All Fields]) AND ("suicidal ideation"[MeSH Terms] OR "suicidal ideation"[All Fields] OR "suicidality"[All Fields] OR "suicide"[MeSH Terms] OR "suicide"[All Fields])).

2. Steps of Meta-Analysis

a. Formulate the research question using the PICO framework, which involves defining the Population, Intervention, Comparison, and Outcome.
b. Search for primary research articles in electronic databases such as Google Scholar, PubMed, and ScienceDirect.
c. Conduct a screening process to establish inclusion and exclusion criteria, followed by a comprehensive critical appraisal of the selected studies.
d. Extract data from the primary studies and compute effect estimates using the RevMan software.
e. Analyze the findings and draw conclusions based on the interpreted results.

3. Inclusion criteria

Primary research articles were full-text studies in English with a cross-sectional design, and analyses were conducted using multivariate methods reporting Adjusted Odds Ratios (aORs).

4. Exclusion criteria

Articles published before 2014, anonymous studies, and studies lacking clearly verifiable data were excluded.

5. Operational definition of variables

Social support: the provision of physical and psychological assistance, attention, appreciation, affection, or other forms of help received by an individual.

Depression: a psychological disorder that may occur in individuals and is characterized by cognitive, behavioral, and emotional disturbances.

Anxiety: a feeling of fear, apprehension, and uneasiness experienced by an individual in response to something.

Suicidal ideation: the presence of thoughts or desires to end one's life without engaging in actions or attempts.

6. Assessment of Primary Study Quality

The quality of the primary studies included in this research was evaluated using a critical appraisal checklist for cross-sectional studies published by Murti (2023). The

checklist consists of thirteen questions, which can be answered with "Yes," "Uncertain," or "No."

7. Data analysis

The research data were analyzed using RevMan version 5.4.1 to calculate effect sizes and assess heterogeneity consistency (I^2). The findings were presented in the form of forest plots and funnel plots.

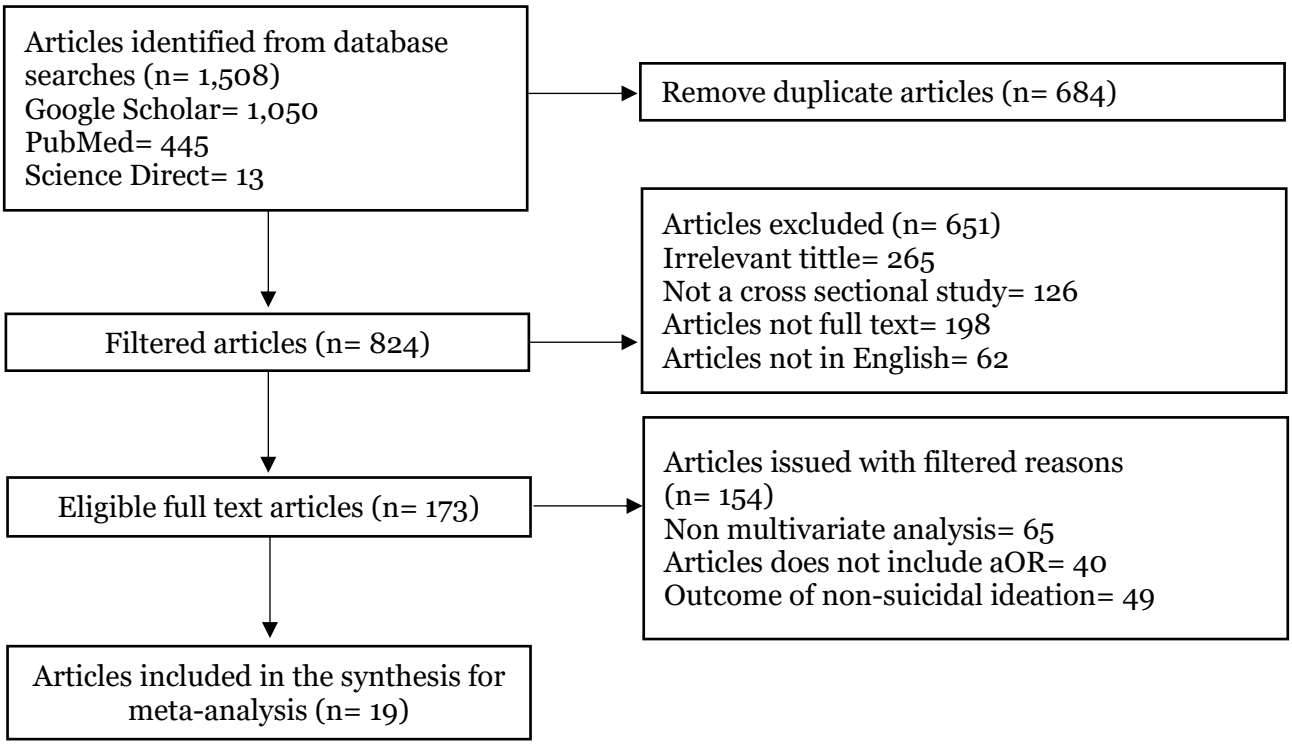

Figure 1. PRISMA flowchart

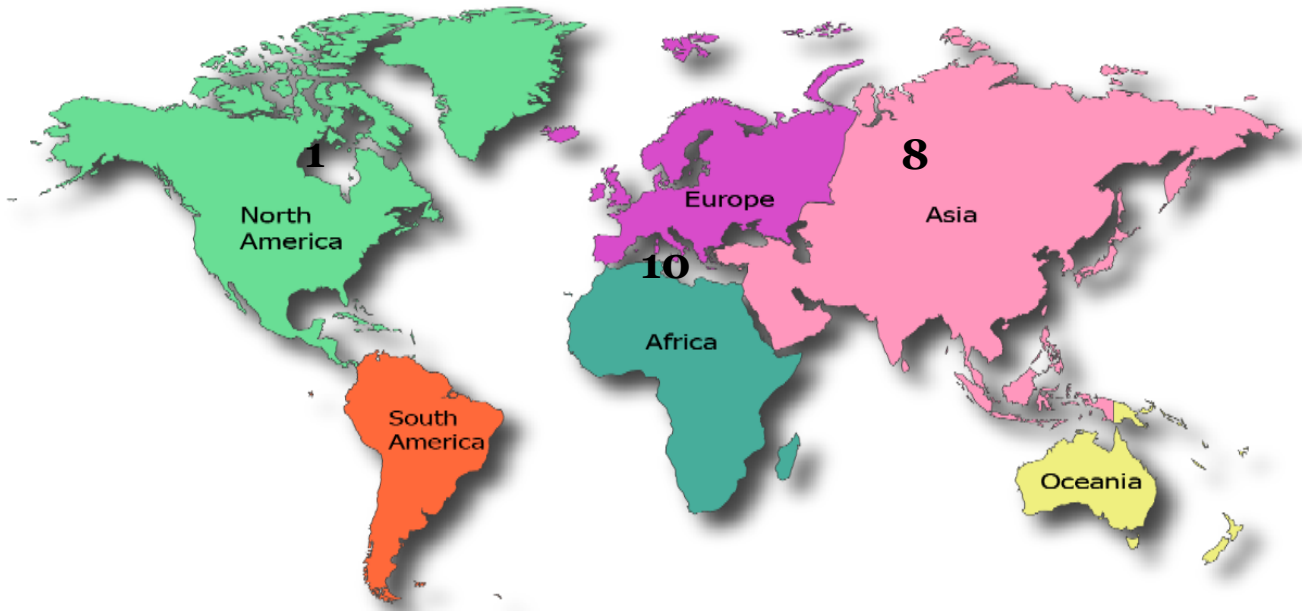

Figure 2. Map showing the distribution of articles included in the meta-analysis

RESULTS

Articles for this study were retrieved from databases such as Google Scholar, PubMed, and ScienceDirect. The article selection process is illustrated in the PRISMA flow-chart (Figure 1). The initial search yielded 1,508 articles, which were subsequently screened, resulting in 19 articles that met the inclusion criteria and were included in the meta-analysis. Figure 2 shows that the studies used as sources for the meta-analysis were conducted in Asia (8 articles), Africa (10 articles), and North America (1 article).

Table 1. Critical appraisal of cross-sectional studies

Authors (Year)	Criteria													Total
	1a	1b	1c	1d	2a	2b	3a	3b	4	5	6a	6b	7	
Wang et al. (2018)	2	2	1	2	2	2	2	2	2	2	2	2	2	24
Yu et al. (2023)	2	2	2	2	1	2	2	2	2	2	2	2	2	25
Bitew et al. (2016)	2	2	2	2	2	2	1	2	2	2	2	2	2	25
Wang et al. (2022)	2	2	1	2	2	2	2	2	2	2	2	2	2	25
Kindaya and Demoze (2020)	2	1	2	2	2	2	1	2	2	2	2	2	2	24
Bamidele et al. (2024)	2	2	2	1	1	2	2	2	2	2	2	2	2	24
Tamirat et al. (2021)	2	1	2	2	2	2	2	2	2	2	2	2	2	25
Ophinni et al. (2020)	2	2	2	2	1	2	2	2	2	2	2	2	2	25
Wonde et al. (2019)	2	1	1	2	2	2	2	2	2	2	2	2	2	24
Gebremariam et al. (2017)	2	1	1	2	2	2	2	2	2	2	2	2	2	24
Gizachew et al. (2021)	2	1	1	2	2	2	2	2	2	2	2	2	2	24
Rukundo et al. (2016)	2	2	2	1	1	2	2	2	2	2	2	2	2	24
Wu et al. (2015)	2	2	2	2	1	2	2	2	2	2	2	2	2	25
López et al. (2018)	2	2	2	2	1	2	2	2	2	2	2	2	1	24
Kang et al. (2016)	2	2	2	2	2	1	2	2	2	2	2	2	2	25
Fu et al. (2023)	2	2	2	2	2	1	2	2	2	2	2	2	1	24
Liu et al. (2017)	2	2	2	2	2	2	1	2	2	1	2	2	2	24
Mugisha et al. (2016)	2	2	2	1	2	2	2	2	2	1	2	2	2	24
Bantjes and Kagee (2021)	2	2	2	2	2	1	2	2	2	2	2	2	2	25

Description of question criteria:

1a. Is the population in the primary study the same as the population in the PICO framework of the meta-analysis??

1b. Is the operational definition of the intervention, namely the exposure status in the primary study, the same as the definition intended in the meta-analysis?

1c. Is the comparison, namely the unexposed status used in the primary study, the same as the definition intended in the meta-analysis?

1d. Is the outcome variable studied in the primary study the same as the definition intended in the meta-analysis?

2a. In an analytical cross-sectional study, did the researchers select the sample from the population using random sampling?

2b. As an alternative, if in an analytical cross-sectional study the sample was not selected randomly, did the researchers select the sample based on outcome status or based on intervention/exposure status?

3a. Were the exposure and outcome variables measured using the same instruments across all primary studies?
3b. If a variable is measured on a categorical scale, are the cutoffs or categories used the same across the primary studies?
4. If the sample was not selected randomly, did the researchers take measures to prevent selection bias? For example, when selecting subjects based on outcome status, was it ensured that this was not influenced by exposure (intervention) status, or when selecting subjects based on exposure (intervention) status, was it ensured that this was not influenced by outcome status?
5. Did the researchers of the primary study take measures to control for confounding effects (for example, by performing multivariate analyses to adjust for the influence of potential confounding factors)?
6a. Did the researchers analyze the data in this primary study using multivariate analysis models (for example, multiple linear regression or multiple logistic regression)?
6b. Did the primary study report the effect size or association from the multivariate analysis (for example, adjusted odds ratio or adjusted regression coefficient)?
7. Is there no potential conflict of interest with the study sponsor that could lead to bias in interpreting the study results?

Assessment criteria:

Yes = 2; Uncertain = 1; No = 0

Table 2. Description of primary studies included in the meta-analysis (n = 11,166)

Author (year)	Sample	Measures	P	I	C	O
Wang et al. (2018)	465	1. Center for Epidemiological Studies Depression (CES-D) 2. Social Support Rating Scale (SSRS)	PLWHA	High depression low social support	Low depression high social support	Suicidal ideation
Yu et al. (2023)	1146	1. Generalized Anxiety Disorder (GAD-2) 2. Patient Health Questionnaire (PHQ-2) 3. Perceived Social Support Scale (PSSS)	PLWH	Anxiety, depression, low social support	No anxiety, no depression, high social support	Suicidal ideation
Bitew et al. (2016)	393	1. Oslo Social Support Scale 2. Patient Health Questionnaire version-9 (PHQ-9)	HIV/ AIDS patients (≥18 years)	Good social support, depression	Poor social support, no depression	Suicidal Ideation

Author (year)	Sample	Measures	P	I	C	O
Wang et al. (2022)	995	1. Patient Health Questionnaire (PHQ-9) 2. Generalized Anxiety Disorder Scale (GAD-7) 3. Social Support Rating Scale (SSRS)	PLWH (≥18 years)	Depressio, anxiety, low social support	No depression, no anxiety, high social support	Suicidal Ideation
Kindaya and Demoze (2020)	412	1. Oslo Social Support Scale (Oslo-3) 2. Patient Health Questionnaire (PHQ-9)	Adult PLWHA (18-67 years)	Poor social support, depression	Moderate social support, no depression	Suicidal Ideation
Bamidele et al. (2024)	412	Questionnaire	HIV positive adults (≥15 years old)	Anxiety	No anxiety	Suicidal Ideation
Tamirat et al. (2021)	395	1. Patient Health Questionnaire-9 (PHQ-9) 2. Oslo Social Support Scale (OSS-3)	HIV positive adults (≥18 years)	Depression, poor social support	No depression, moderate social support	Suicidal Ideation
Ophinni et al. (2020)	86	1. Symptoms Check List 90 (SCL-90)	Adult PLHIV (18-65 years)	Depressive symptoms, anxiety symptoms	No depressive symptoms, no anxiety symptoms	Suicidal ideation
Wonde et al. (2019)	413	1. Patient Health Questionnaire-9 (PHQ-9) 2. Oslo Social Support Scale	Youth HIV/AIDS patients (15-24 years)	Depression, poor social support	No depression, strong social support	Suicidal ideation
Gebremariam et al. (2017)	417	1. Patient Health Questionnaire (PHQ-9)	HIV positive patients (≥18 years)	Poor social support, presence depression	Good social support, absence depression	Suicidal ideation
Gizachew et al. (2021)	326	1. Patient Health Questionnaire (PHQ-4) 2. Oslo Social Support Scale (OSS-3)	PLWHA (≥18 years)	Moderate to severe anxiety, poor social support	No anxiety, moderate to strong social support	Suicidal ideation

Author (year)	Sample	Measures	P	I	C	O
Rukundo et al. (2016)	543	1. Beck Anxiety Inventory 2. Beck Depression Inventory	PLWHA (15-70 years)	Anxiety, depression	No anxiety, no depression	Suicidal ideation and attempt
Wu et al. (2015)	184	1. Center for Epi-demiological Studies Depression Scale (CES-D) 2. Self-Rating Anxiety Scale (SAS)	HIV positive MSM (18-62 years)	Depression symptoms, anxiety symptoms	No depression symptoms, no anxiety symptoms	Suicidal ideation
López et al. (2018)	648	1. Generalized Anxiety Disorder-7 (GAD-7)	HIV Patients (≥18 years)	Anxiety symptomp	No anxiety symptomp	Suicidal ideation
Kang et al. (2016)	422	1. Questionnaire Items developed by Duong et el. (2001)	HIV infected adults (≥20 years)	Depression, high social support	No depression, low social support	Suicidal ideation
Fu et al. (2023)	244	1. Center for Epidemiological Studies Depression Scale (CES-D 10)	HIV positive MSM (≥18 years)	Depression	No depression	Suicidal ideation
Liu et al. (2017)	577	1. Social Support Rating Scale (SSRS) 2. Generalized Anxiety Disorder-7 (GAD-7)	NPLWH (≥18 years)	High social support, anxiety positive	Low social support, anxiety negative	Suicidal ideation
Mugisha et al. (2016)	2400	1. M.I.N.I. neuro-psychiatric interview (MINI Plus)	HIV/ AIDS (18-54 years)	MDD GAD	No MDD, no GAD	Suicidali ty
Bantjes and Kagee (2021)	688	1. Structured cli-nical interview for the DSM5—research Version (SCID-RV)	HIV Patients	MDD	No MDD	Suicidal ideation

Table 3 shows that there are 11 cross-sectional studies examining the effect of social support on suicidal ideation among people living with HIV (PLHIV), with the highest adjusted odds ratios (aOR) reported in the studies by Gebremariam et al. (2017) and Gizachew et al. (2021), and the lowest aOR reported in the study by Tamirat et al. (2021).

Table 3. Adjusted Odds Ratio (aOR) of the Effect of Social Support on Suicidal Ideation among People Living with HIV (PLHIV)

Author (year)	aOR	95% CI	
		Lower Limit	Upper Limit
Gebremariam et al. (2017)	0.93	0.49	1.78
Wang et al. (2022)	0.83	0.57	1.20
Tamirat et al. (2021)	0.24	0.08	0.68
Kindaya and Demoze (2020)	0.33	0.09	1.12
Wang et al. (2018)	0.54	0.33	0.93
Wonde et al. (2019)	0.83	0.34	2.00
Gizachew et al. (2021)	0.93	0.36	2.38
Bitew et al. (2016)	0.40	0.20	0.76
Yu et al. (2023)	0.46	0.26	0.75
Kang et al. (2016)	0.69	0.58	0.82
Liu et al. (2017)	0.52	0.31	0.89

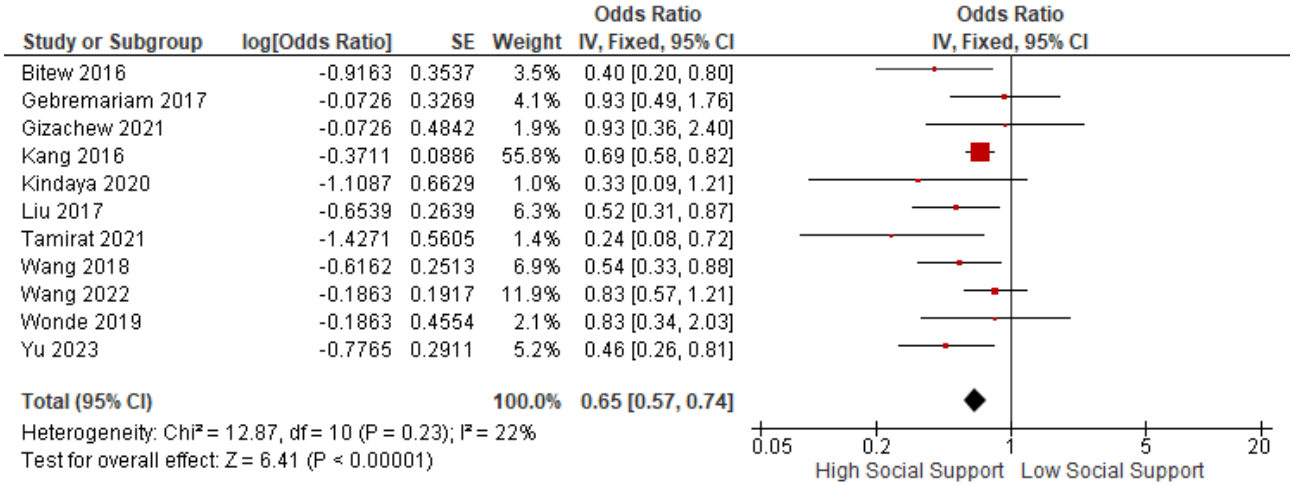

Figure 3. Forest Plot of the Effect of Social Support on Suicidal Ideation among People Living with HIV (PLHIV)

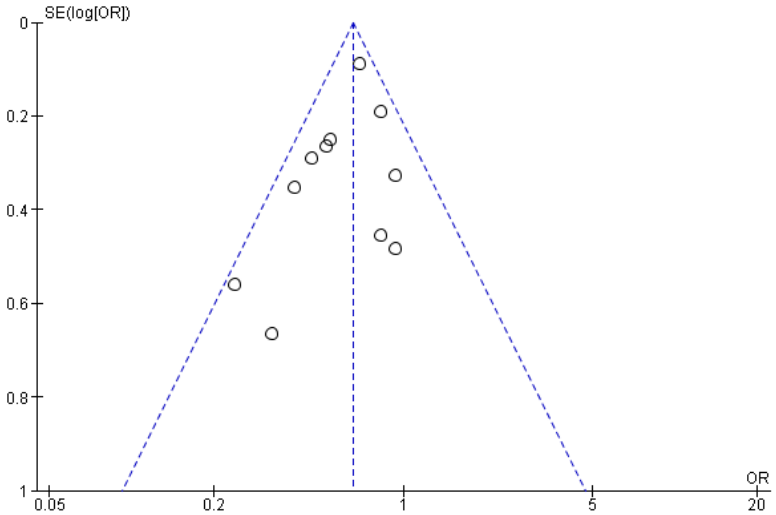

Figure 4. Funnel Plot of the Effect of Social Support on Suicidal Ideation among People Living with HIV (PLHIV)

The forest plot in Figure 3 shows that higher social support reduces the risk of suicidal ideation among people living with HIV (PLHIV), and this effect is statistically significant. PLHIV living in communities with high social support have 0.65 times the odds of experiencing suicidal ideation compared to those with low social support (aOR= 0.65; 95% CI= 0.57 to 0.74; p < 0.001). The forest plot also indicates low heterogeneity in effect estimates across studies (I^2= 22%; p= 0.23); therefore, the pooled effect estimate was calculated using a fixed-effect model approach.

The funnel plot in Figure 4 shows a symmetrical distribution of effect estimates on both sides of the vertical line representing the pooled estimate. Therefore, the funnel plot indicates no evidence of publication bias.

Table 4 shows that there are 15 cross-sectional studies examining the effect of depression on suicidal ideation among people living with HIV (PLHIV), with the highest adjusted odds ratio (aOR) reported in the study by Bitew et al. (2016) and the lowest aOR reported in the study by Rukundo et al. (2016).

Table 4. Adjusted Odds Ratio (aOR) of the Effect of Depression on Suicidal Ideation among People Living with HIV (PLHIV)

Author (year)	aOR	95% CI	
		Lower Limit	Upper Limit
Bitew et al. (2016)	17	8.8	33.3
Yu et al. (2023)	1.61	1.07	2.41
Rukundo et al. (2016)	1.06	0.97	1.17
Ophinni et al. (2020)	1.26	1.08	1.48
Wu et al. (2015)	2.60	1.10	5.90
Wonde et al. (2019)	7.10	3.90	12.9
Wang et al. (2018)	2.07	1.62	4.51
Kindaya and Demoze (2020)	1.48	0.79	2.79
Tamirat et al. (2021)	4.67	1.75	12.39
Wang et al. (2022)	2.43	1.51	3.88
Gebremariam et al. (2017)	2.45	1.45	4.12
Kang et al. (2016)	6.11	2.40	15.5
Fu et al. (2023)	4.52	2.33	8.76
Mugisha et al. (2016)	9.48	7.42	12.11
Bantjes and Kagee (2021)	4.13	2.35	7.26

The forest plot in Figure 5 shows that people living with HIV (PLHIV) who have depression are 3.21 times more likely to experience suicidal ideation compared to those without depression, and this result is statistically significant (aOR = 3.21; 95% CI= 2.07 to 4.99; p < 0.001). The forest plot also indicates a high level of heterogeneity in effect estimates across studies (I^2 = 97%; p<0.001); therefore, the pooled effect estimate was calculated using a random-effects model approach.

The funnel plot in Figure 6 shows a symmetrical distribution of effect estimates on both sides of the vertical line representing the pooled estimate. Therefore, the funnel plot indicates no evidence of publication bias.

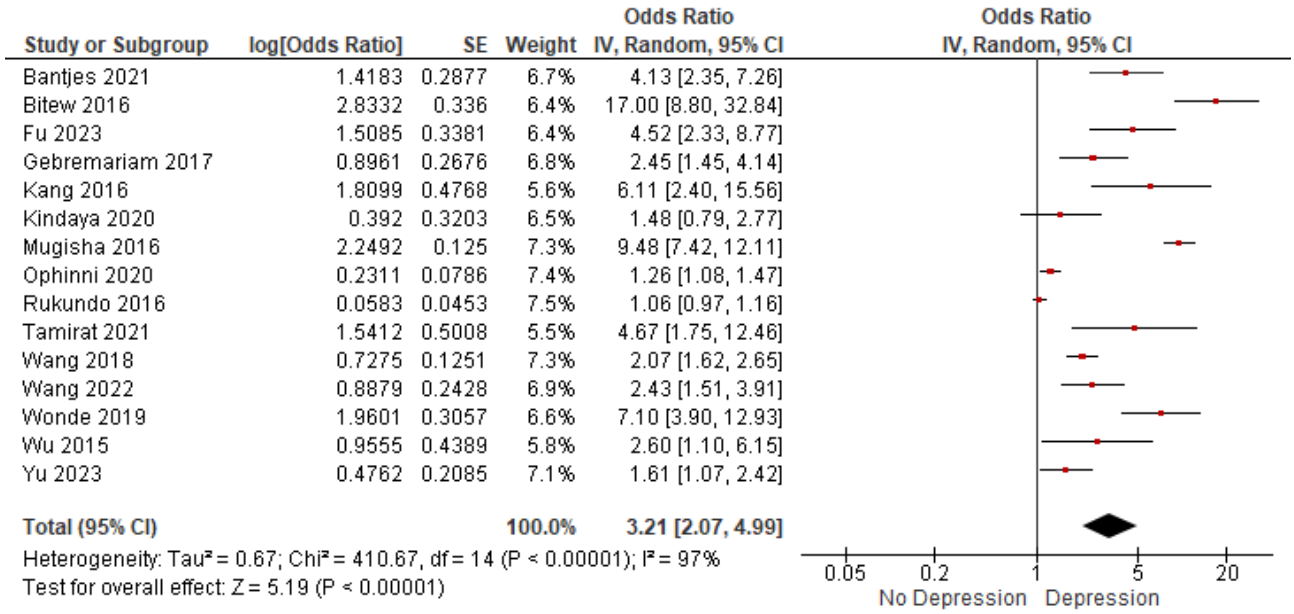

Figure 5. Forest Plot of the Effect of Depression on Suicidal Ideation among People Living with HIV (PLHIV)

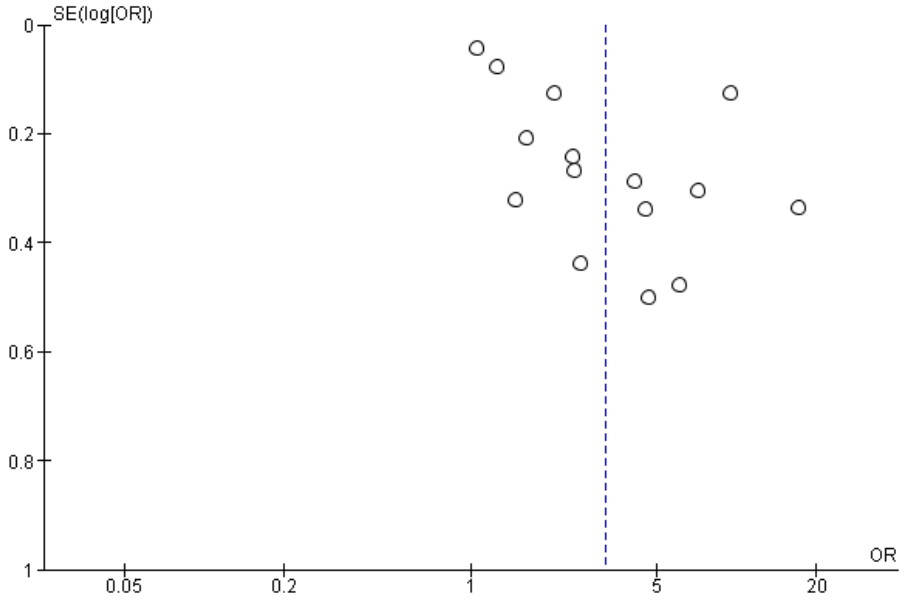

Figure 6. Funnel Plot of the Effect of Depression on Suicidal Ideation among People Living with HIV (PLHIV)

Table 5 shows that there are 10 cross-sectional studies examining the effect of anxiety on suicidal ideation among people living with HIV (PLHIV), with the highest adjusted odds ratio (aOR) reported in the study by Gizachew et al. (2021) and the lowest aOR reported in the study by Ophinni et al. (2020).

Table 5. Adjusted Odds Ratio (aOR) of the Effect of Anxiety on Suicidal Ideation among People Living with HIV (PLHIV)

Author (year)	aOR	95% CI	
		Lower Limit	Upper Limit
Yu et al. (2023)	2.71	1.76	4.16
Bamidele et al. (2024)	4.03	1.33	12.15
Rukundo et al. (2016)	1.00	0.95	1.06
Gizachew et al. (2021)	5.47	2.01	14.88
Ophinni et al. (2020)	0.91	0.79	1.05
Wu et al. (2015)	2.70	1.20	6.10
Wang et al. (2022)	2.80	1.77	4.42
López et al. (2018)	1.79	1.45	2.22
Liu et al. (2017)	1.10	0.53	2.27
Mugisha et al. (2016)	1.23	0.96	1.59

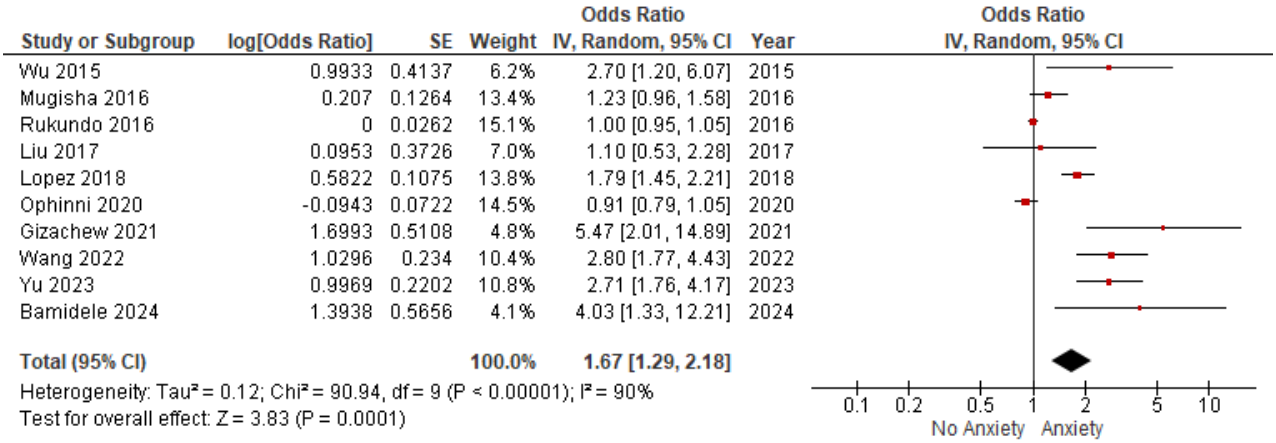

Figure 7. Forest Plot of the Effect of Anxiety on Suicidal Ideation among People Living with HIV (PLHIV)

The forest plot in Figure 7 shows that people living with HIV (PLHIV) who experience anxiety are 1.67 times more likely to have suicidal ideation compared to those without anxiety, and this result is statistically significant (aOR = 1.67; 95% CI = 1.29–2.18; p = 0.001). The forest plot also indicates a high level of heterogeneity in effect estimates across studies (I^2= 90%; p <0.001); therefore, the pooled effect estimate was calculated using a random-effects model approach.

The funnel plot in Figure 8 shows that the distribution of effect estimates is more concentrated on the right side than on the left side of the vertical line representing the pooled estimate. Therefore, the funnel plot indicates the presence of publication bias. Since most of the effect estimates are located on the right side of the vertical line—consistent with the position of the diamond symbol, which also lies to the right of the null hypothesis line—this publication bias tends to overestimate the true effect.

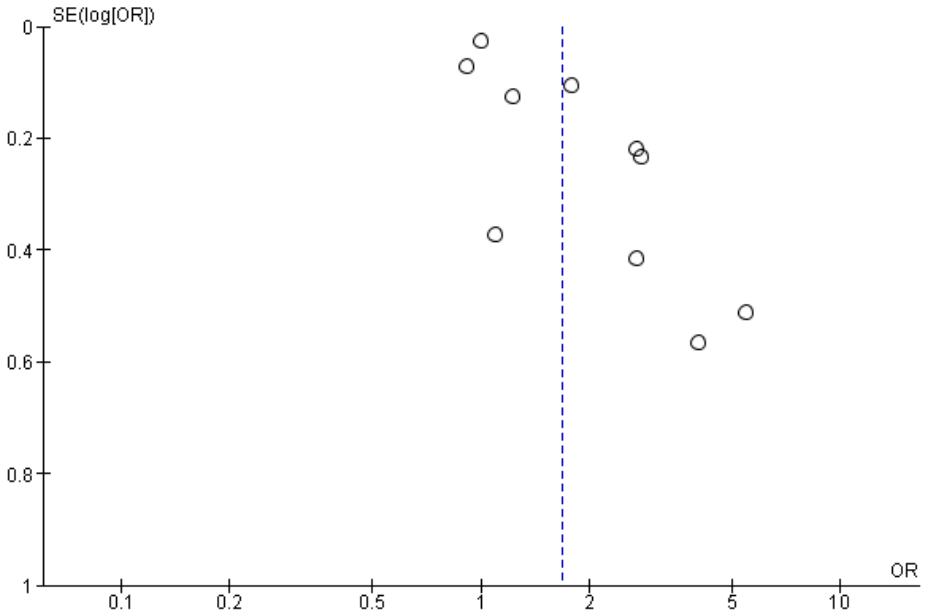

Figure 8. Funnel Plot of the Effect of Anxiety on Suicidal Ideation among People Living with HIV (PLHIV)

DISCUSSION

This meta-analysis reports the effects of social support, depression, and anxiety on suicidal ideation among people living with HIV (PLHIV). The findings indicate that depression increases suicidal ideation among PLHIV (aOR = 3.21; 95% CI = 2.07–4.99; p<0.001), anxiety also increases suicidal ideation (aOR = 1.67; 95% CI = 1.29–2.18; p = 0.001), while higher social support reduces suicidal ideation (aOR = 0.65; 95% CI = 0.57–0.74; p < 0.001). These results are consistent with the study by Yu et al. (2023), which reported that PLHIV with suicidal ideation tend to experience higher levels of anxiety and depression, as well as lower perceived social support.

1. The Effect of Social Support on Suicidal Ideation

Social support is an essential component of health (Gariepy et al., 2016). Among PLHIV, social support plays a unique role in maintaining health. Positive social support can help reduce health-related behaviors that negatively impact viral replication, such as poor adherence to antiretroviral therapy (ART), and promote behaviors that reduce the risk of HIV/AIDS transmission (Ahmed et al., 2021).

The results of this study are consistent with findings from Armoon et al. (2022), who reported that social support plays a significant role in the psychological adjustment of individuals living with HIV/AIDS. High levels of social support can mitigate negative feelings associated with HIV-related stigma among PLHIV. Similarly, Wonde et al. (2019) found that social support contributes to psychological adaptation among people living with HIV/AIDS, whereas the absence of social support leads to feelings of loneliness and helplessness, thereby increasing the risk of suicide. Multivariate analysis by Fredericksen et al. (2021) also found that lower social support was associated with higher levels of depression and psychological symptom burden, thereby strengthening suicidal ideation among PLHIV.

2. The Effect of Depression on Suicidal Ideation

Suicidal ideation is a common symptom among individuals with depression and may arise as a response to rejection by relatives or society regarding their HIV status. It may also stem from fear of complications and loss of life meaning, leading individuals to view suicide as an escape from psychological distress (Machado et al., 2021).

This theory is supported by findings from Luo et al. (2022), who identified depression as an important factor for suicidal ideation, noting that the presence of clinically active major depressive episodes is a strong predictor of suicidal thoughts. Previous studies have also reinforced this finding, showing that depression exerts a direct influence on suicidal ideation (Wang et al., 2018). Depression increases suicidal thoughts by negatively affecting daily life activities and mental health, which are often linked to physical health problems such as loss of appetite and sleep disturbances (Degroote et al., 2014).

3. The Effect of Anxiety on Suicidal Ideation

Anxiety disorders are among the most common mental health conditions experienced by people living with HIV (PLHIV) (Brandt et al., 2017). This notion is supported by the study conducted by Ji et al. (2024), which revealed that the proportion of PLHIV experiencing anxiety disorders is considerably high (15.5%). Individuals with HIV often face stigma, discrimination, and social isolation, which can lead to significant disruptions in interpersonal and social relationships. Chronic damage resulting from other disease-related complications and poor disease prognosis further increase the incidence of anxiety disorders, as well as feelings of guilt and anger, which may progress to depression and anxiety symptoms. Psychological and social stressors influence patients' underlying conditions and contribute to a heightened risk of suicide (Passos et al., 2014).

This meta-analysis demonstrates that depression and anxiety among PLHIV increase the risk of suicidal ideation, while higher levels of social support among PLHIV reduce that risk. Therefore, stress management, the elimination of social discrimination, and the active provision of social and familial support systems should be continously strengthened within the PLHIV population.

AUTHOR CONTRIBUTIONS

Collection and compilation of articles: Aulia Putri, Anis Lupita, Maoli Zartika
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FUNDING AND SPONSORSHIP

This research was self-funded.

CONFLICT OF INTEREST

There are no conflicts of interest in this study.

ACKNOWLEDGMENTS

We would like to thank the Master of Public Health Program at Universitas Sebelas Maret for supporting the publication of this manuscript.

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