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Effectiveness of Multi-Source Social Support in Reducing Suicidal Ideation and Risk Behaviours among At-Risk Senior School Students in Uasin Gishu County, Kenya

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Abstract

Suicidal ideation among adolescents is a leading school mental health concern in Kenya, yet little is known about whether the social support received by at-risk students reduces suicidal ideation and behaviour. This study evaluates the effectiveness of social support provided to students exhibiting suicidal risk behaviours and ideation in public senior schools in Uasin Gishu County, Kenya. Guided by Joiner's Interpersonal Theory of Suicide and a pragmatic paradigm, the study adopted a sequential explanatory mixed-methods design, combining a prospective cohort (baseline, 3, 6 and 12 months) with an embedded qualitative strand. Twenty-four of 165 public schools were sampled and 192 screen-positive students were enrolled after screening 1,512 students. The primary outcome was change in suicidal ideation severity (SIQ-JR, 0 to 90) at 6 months, analysed using inverse-probability-of-treatment and attrition weighting, baseline-adjusted models and school-clustered robust inference. High-intensity structured support was associated with a 6.1-point greater reduction in suicidal ideation at 6 months (95% CI: -9.9 to -2.3; d = 0.56; p = 0.003), higher 12-month remission (63.7% vs. 40.3%) and a mediated share of 36% through reduced perceived burdensomeness and thwarted belongingness. Suicide attempts were too rare to support statistical inference. The study concludes that high-intensity structured social support significantly reduces suicidal ideation among at-risk students. It recommends that schools strengthen structured counselling, regular follow-ups and appropriate referral services to support affected students.

Keywords: suicidal ideation; social support; school-based intervention; adolescents; Interpersonal Theory of Suicide; Students; Uasin Gishu County; Kenya.

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Introduction

Adolescent suicide prevention remains a major global public health priority, with schools providing an important setting for early identification, intervention and continued psychosocial support. Their accessibility and sustained interaction with adolescents place teachers, counsellors and other school personnel in a strategic position to identify emotional distress and support vulnerable students. In Kenya, a cross-sectional study involving high school students from three regional settings documented suicidal thoughts, plans and attempts, highlighting the need for effective school-based prevention and intervention strategies (Ndetei et al., 2024). Similarly, a study conducted in the Nairobi metropolitan area examined the severity and intensity of suicidal ideation across age and gender groups, emphasising the importance of context-specific intervention approaches for young people (Mortier et al., 2025). Although these studies contribute to understanding the magnitude and characteristics of adolescent suicidal ideation, they provide limited evidence on the effectiveness of support received by students after identification of suicidal risk. In particular, the extent to which support from peers, teachers, school counsellors and families influences changes in suicidal ideation remains insufficiently established.

Evidence from intervention studies demonstrates the potential of psychosocial approaches in addressing adolescent mental health challenges. A systematic review of randomised controlled trials examining preventive interventions for adolescent depression and suicidal tendencies identified cognitive-behavioural approaches and specialist-delivered psychoeducation as prominent intervention strategies. However, methodological variations across studies limited comparisons of their effectiveness in different settings (Oh et al., 2024). In Kenya, the Shamiri programme has demonstrated the feasibility of delivering locally adapted psychosocial interventions through trained lay providers in school settings. A five-arm randomised controlled trial involving 1,252 high school students examined the full intervention, its individual components and an active study-skills control, providing evidence on the potential contribution of structured psychosocial activities to adolescent mental health (Sultana et al., 2023). Additionally, pilot research on school-based mindfulness adapted for Kenyan senior schools reflects increasing interest in culturally relevant and school-based approaches to adolescent psychological well-being (Ndetei et al., 2024). Nevertheless, these interventions do not adequately establish whether the intensity and sources of social support received by students already exhibiting suicidal risk behaviours and ideation influence the severity and persistence of suicidal ideation over time.

The central research gap concerns the limited empirical understanding of the effectiveness of social support among students already identified as exhibiting suicidal risk behaviours and ideation. Existing intervention research has predominantly examined general adolescent populations, preventive programmes and broader mental health outcomes. Consequently, less is known about how structured support from different sources influences suicidal ideation severity, remission and suicidal behaviour among identified at-risk students. Furthermore, the psychological pathways through which social support may influence suicidal ideation, particularly perceived burdensomeness and thwarted belongingness, require further investigation. The contribution of individual support sources, differences in intervention intensity and barriers affecting access to sustained support also remain insufficiently understood. This evidence gap limits the development of targeted school-based interventions that respond to the needs of students experiencing suicidal risk.

The study therefore evaluated the effectiveness of social support provided to students exhibiting suicidal risk behaviours and ideation in public senior schools in Uasin Gishu County, Kenya. Specifically, it examined the type, source and intensity of social support received; determined its effect on suicidal ideation severity over 12 months; assessed its relationship with suicidal ideation remission and suicide attempts; investigated the mediating roles of perceived burdensomeness and thwarted belongingness; examined variations in effectiveness across student characteristics and support sources; and explored students' experiences and barriers to accessing support. Guided by Joiner's Interpersonal Theory of Suicide, the study hypothesised that students receiving high-intensity structured multi-source social support would experience a greater reduction in suicidal ideation severity at six months than those receiving low-intensity or usual support.

Literature Review

Suicidal Ideation among Kenyan Adolescents

Suicidal ideation among adolescents remains a major public health and educational concern because of its association with psychological distress, interpersonal difficulties and suicidal behaviour. Recent Kenyan evidence demonstrates the magnitude of this problem among young people. Ndetei et al. (2024), in a study conducted in Nairobi Metropolitan, examined the severity and intensity of suicidal ideation among young people aged 14–25 years and highlighted the need for age- and gender-responsive intervention strategies. Similarly, Waraan et al. (2023), in a qualitative study involving 42 young people and 11 caregivers in Nairobi, identified academic pressure, family conflict, relationship difficulties, socioeconomic hardship, loneliness and harmful social media experiences as factors associated with suicidal behaviour. These findings demonstrate that adolescent suicidal risk develops within interacting psychological, family, school and social environments.

Social relationships and the availability of support are particularly important in understanding suicidal ideation among adolescents. Zhu et al. (2022), using data from the National Adolescent Mental Health Surveys in Kenya, Indonesia and Vietnam, identified three social support categories: caregiver-focused support, other support and limited support. In Kenya, adolescents receiving caregiver-focused

support had significantly lower odds of suicidal ideation (aOR = 0.14, 95% CI: 0.10–0.19) compared with those receiving limited support. Further, adolescents in the other-support category also had lower odds of suicidal ideation (aOR = 0.27, 95% CI: 0.19–0.39). These findings establish the importance of supportive relationships in adolescent mental health. However, the study examined associations rather than changes in suicidal ideation following the provision of structured support. Consequently, the effectiveness of different levels of support among students already identified as exhibiting suicidal risk behaviours and ideation remains insufficiently established.

Social Support as a Protective Factor and Its Measurement

Social support provides emotional reassurance, practical assistance, guidance and interpersonal connection to individuals experiencing psychological distress. Among adolescents, support from parents, peers, teachers and other significant individuals can strengthen relationships and provide a sense of acceptance and security. Teismann et al. (2023) established that caregiver-focused support was associated with significantly lower odds of suicidal ideation and self-harm among Kenyan adolescents. Their findings further demonstrated that adolescents receiving support from other interpersonal networks also experienced better mental health outcomes than those with limited support. These results suggest that the availability of supportive relationships is an important protective resource during adolescence.Recent Kenyan research further supports the relationship between social support and psychological well-being. Teasdale-Dubé and Viau-Quesnel (2024), in a study involving 7,865 Senior School students aged 12–20 years, established that social support was a significant protective factor against depression and anxiety symptoms. The study demonstrated the importance of social support in promoting adolescent mental health within Kenyan school settings. Similarly, Metekiya et al. (2022) found that young people experiencing suicidal behaviour valued being listened to without judgement, receiving emotional reassurance and obtaining assistance in accessing mental health services. These findings demonstrate that support involves both the availability of supportive relationships and the actual assistance provided during periods of distress. Nevertheless, the studies do not establish whether the frequency, intensity and continuity of such support influence suicidal ideation severity among identified at-risk students.

The measurement of social support is therefore important when evaluating its effectiveness. Perceived social support concerns students' assessment of the availability of assistance from their social networks, whereas received social support concerns the actual assistance provided. Legazpi et al. (2022) demonstrated the relevance of assessing support from caregivers, peers and other significant individuals when examining adolescent mental health. Kim (2021) also incorporated social support measures when investigating psychological well-being among Kenyan Senior School students. However, measuring perceived support alone may not establish whether students receive regular counselling, emotional assistance, practical help and follow-up services. This study therefore combined the Multidimensional Scale of Perceived Social Support (MSPSS) with a register-based Support Intensity Index to examine both perceived support and the actual intensity of assistance received.

School-Based and Lay-Delivered Interventions

Schools provide an important setting for suicide prevention because they offer opportunities for early identification, psychosocial support, monitoring and referral of students experiencing psychological distress. Recent systematic reviews have demonstrated the potential of school-based interventions in addressing adolescent suicidal behaviour. Owsiany and Fiske (2025), in a systematic review of 53 studies covering 41 suicide prevention programmes, identified improvements in suicidal behaviour, help-seeking, knowledge, attitudes and coping among adolescents. However, the review established that most studies were conducted in high-income countries, with limited evidence from low- and middle-income settings. Similarly, Mohamed and Ahmed (2022), in a systematic review of school-based suicide prevention interventions, found positive outcomes across several programmes but established that none had sufficient evidence to be classified as having a high level of effectiveness. These findings demonstrate the need for further evaluations of school-based interventions, particularly in resource-constrained settings.

Kenyan evidence further demonstrates the feasibility of delivering psychosocial interventions through trained lay providers. Udupa et al. (2023) evaluated the Shamiri intervention through a five-arm randomised controlled trial involving 1,252 high school students. The study examined the full intervention, its individual components and an active study-skills control over eight months. Anxiety, depression and well-being improved across the study conditions, although significant differences between the intervention and active control groups were not established. The findings demonstrate the potential contribution of structured psychosocial activities to adolescent mental health, particularly when interventions address students' immediate needs. However, the study did not specifically evaluate suicidal ideation among students already identified as exhibiting suicidal risk behaviours and ideation. Therefore, its findings cannot independently establish the effectiveness of structured social support in reducing suicidal ideation among at-risk students.

The nature and intensity of support provided through school-based interventions also require consideration. Xu et al. (2024) identified the importance of contextually adapted prevention programmes, while Rahman et al. (2022) highlighted the need for stronger evidence on the effectiveness of school-based suicide prevention approaches. Park (2024) further established that young people and caregivers value counselling, active listening, family involvement and accessible mental health services when addressing suicidal behaviour. These findings suggest that effective support requires coordinated responses involving students, families, teachers and mental health professionals. However, limited evidence establishes whether combining these support sources produces better outcomes than less structured forms of assistance among students already exhibiting suicidal risk.

Gaps and Rationale for the Study

The reviewed literature establishes that suicidal ideation among Kenyan adolescents is associated with psychological distress, adverse interpersonal experiences and inadequate social support (Rahman et al., 2022; Park (2024)). However, important empirical gaps remain. First, existing Kenyan studies have largely examined the prevalence, correlates and social support patterns associated with suicidal ideation

rather than changes following the provision of structured support. Second, limited evidence compares outcomes according to the intensity and sources of support actually received by students identified as exhibiting suicidal risk behaviours and ideation. Third, the psychological mechanisms through which social support influences suicidal ideation, particularly perceived burdensomeness and thwarted belongingness, require further investigation (Xu et al., 202; Udupa et al., 2023).

Furthermore, existing intervention studies have predominantly examined universal prevention programmes and broader adolescent mental health outcomes rather than the effectiveness of different levels of support among identified at-risk students (Mohamed & Ahmed, 2022; Owsiany & Fiske, 2025). Limited longitudinal evidence also explains the contribution of peers, teachers, school counsellors and families to sustained improvements in suicidal ideation. This study addressed these gaps by evaluating the effectiveness of social support provided to students exhibiting suicidal risk behaviours and ideation in public senior schools in Uasin Gishu County, Kenya. Through a prospective cohort and an embedded qualitative investigation, the study examined changes in suicidal ideation severity, remission and suicidal behaviour over 12 months while investigating the mediating roles of perceived burdensomeness and thwarted belongingness.

Theoretical Framework

The study was anchored in the Interpersonal Theory of Suicide (IPTS) developed by Joiner et al. (2009), which proposes that suicidal desire arises when a person experiences thwarted belongingness (loneliness and the absence of reciprocal care) and perceived burdensomeness (the belief that one is a liability to others), and that attempts require acquired capability for self-harm. A recent large prospective study of adolescents found that thwarted belongingness, perceived burdensomeness and their interaction each predicted suicidal ideation at baseline and follow-up (Phillip et al., 2022). Social support is conceptualised here as the modifiable exposure that can increase belongingness and reduce perceived burdensomeness, and through them lower ideation and, in time, behaviour (Figure 1).

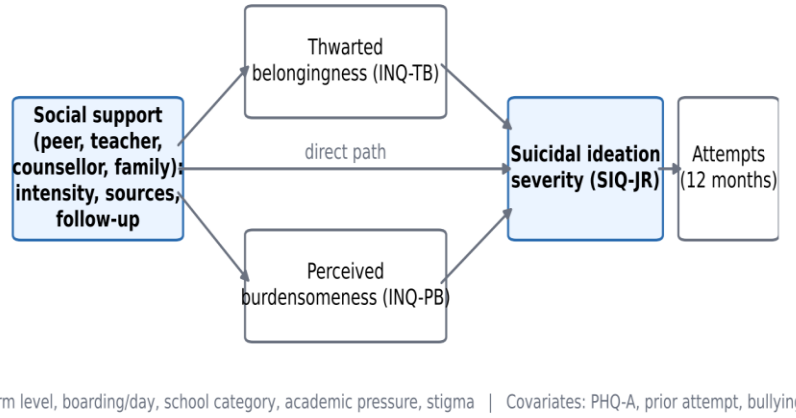

Figure 1: Conceptual framework linking social support to suicidal ideation through IPTS mechanisms

Support is characterised by its intensity (number of contacts), breadth (number of sources) and continuity (a documented follow-up plan).

Methodology

Research Paradigm

The study was guided by the pragmatic research paradigm, which supports the integration of quantitative and qualitative approaches to address complex research problems. Pragmatism was appropriate because evaluating social support required measuring changes in suicidal ideation and understanding students' experiences of the support received from peers, teachers, school counsellors and families.

The quantitative approach examined changes in suicidal ideation severity, remission and suicidal behaviour over time, while the qualitative approach explored the experiences and factors influencing the effectiveness of social support. Since withholding support from students at risk of suicide would have been unethical, the study adopted an observational approach that examined naturally occurring differences in support intensity while controlling for potential confounding factors.

Research Design

The study adopted a sequential explanatory mixed-methods design incorporating a prospective cohort and an embedded qualitative component. The quantitative phase followed students for 12 months, with data collected at baseline (T0), three months (T1), six months (T2) and twelve months (T3). The qualitative phase followed preliminary quantitative analysis and involved interviews and focus group discussions with selected students and stakeholders.

The quantitative component examined the relationship between structured social support and changes in suicidal ideation severity. The qualitative component explained students' experiences and the factors influencing support effectiveness. Participants were selected to represent improved, stable and worsened outcome trajectories. Integration of both components provided a comprehensive understanding of the study findings.

Study Area

The study was conducted in Uasin Gishu County, Kenya, which comprises six sub-counties: Turbo, Kesses, Moiben, Kapseret, Ainabkoi and Soy. The county has diverse public senior schools, including national, extra-county, county and sub-county institutions.

The schools differ in geographical location, student population, boarding arrangements and available support services. They also comprise boys', girls' and mixed institutions. These variations provided an appropriate setting for examining the provision and effectiveness of social support among students exhibiting suicidal risk behaviours and ideation.

Target Population

The target population comprised students enrolled in the 165 public senior schools in Uasin Gishu County, together with relevant school personnel and parents or guardians. The student population was approximately 71,872, based on education records available during the study.

The quantitative component focused on students identified as exhibiting suicidal risk behaviours and ideation through standardised screening. The qualitative component involved teachers, school counsellors, deputy principals, class teachers and parents or guardians. These participants provided information on identifying at-risk

students, providing support and facilitating access to appropriate assistance.

Sampling Techniques and Sample Size Determination

A multistage sampling procedure was used to select schools and students. First, 24 of the 165 public senior schools were selected using stratified cluster sampling with probability proportional to size. Stratification considered sub-county and school category to ensure representation of boys', girls' and mixed schools.

Second, approximately 63 students from each selected school were screened, giving 1,512 students. Screening used the Ask Suicide-Screening Questions (ASQ) and the Columbia-Suicide Severity Rating Scale (C-SSRS) screener. Third, eight eligible and consenting students were enrolled from each school, resulting in a cohort of 192 students.

Qualitative participants were selected purposively to capture diverse experiences and perspectives. Selection considered students' outcome trajectories and the nature of support received. Teachers, school counsellors, deputy principals, class teachers and parents or guardians were also included. The qualitative component comprised approximately 24–28 individual interviews and four focus group discussions, with recruitment guided by information power.

Sample Size Determination

The quantitative sample size was estimated using the formula for comparing two independent groups:

$$n = \frac{2\left(Z_{\alpha/2} + Z_{\beta}\right)^2}{d^2}$$

Where $\left(Z_{\alpha/2} = 1.96, Z_{\beta} = 0.8416\right)$ and$d = 0.50.$

Substitution gives:

$$n = \frac{2(1.96 + 0.8416)^2}{0.50^2} = 62.8 \approx 63$$

The minimum sample was therefore 63 students per group.

To account for clustering within schools, the design effect was calculated as:

$$DEFF = 1 + (m - 1)\rho$$

Where (m=8) and the assumed intraclass correlation coefficient \(rho=0.03).

$$DEFF = 1 + (8 - 1)(0.03) = 1.21$$

The cluster-adjusted sample was:

$$63 \times 1.21 = 76.23 \approx 77$$

Allowing for 15% attrition:

$$n = \frac{77}{1 - 0.15} = 90.59 \approx 91$$

The required sample was therefore 91 students per group, giving 182 participants. The study enrolled 192 students, exceeding the estimated minimum.

The screening requirement was estimated using an assumed 15% screening-positive rate and an 85% consent rate:

$$N = \frac{192}{0.15 \times 0.85} \approx 1{,}506$$

Accordingly, 1,512 students were screened. The final sample provided an adequate basis for examining moderate differences in suicidal ideation severity, although it was not designed to establish small effects or definitive differences in rare outcomes such as suicide attempts.

Data Collection Instruments and Procedures

Quantitative data were collected using structured questionnaires administered electronically by trained research assistants at four measurement points: baseline, three months, six months and twelve months.

The Suicidal Ideation Questionnaire-Junior (SIQ-JR) measured the primary outcome. It contains 15 items, with scores ranging from 0 to 90; higher scores indicate greater suicidal ideation severity. A cut-off score of 31

was used to identify elevated suicidal ideation.

The C-SSRS assessed suicidal ideation severity and suicidal behaviour, including suicide attempts. The Interpersonal Needs Questionnaire (INQ) measured perceived burdensomeness and thwarted belongingness, while the Patient Health Questionnaire for Adolescents (PHQ-A) assessed depressive symptoms.

The Multidimensional Scale of Perceived Social Support (MSPSS) assessed perceived support from family, friends and significant others. A school Support Register documented actual sources of support, contacts, frequency of assistance and follow-up arrangements. These records informed the Support Intensity Index.

High-intensity structured support was defined as support from at least two distinct sources accompanied by a documented follow-up plan. Students who did not meet these criteria were classified as receiving low-intensity or usual support.

Qualitative data were collected through semi-structured interviews and focus group discussions following preliminary analysis of the six-month findings. Students with improved, stable and worsened outcomes were included to explain differences in support experiences. Stakeholder interviews explored support practices, perceived effectiveness and implementation challenges.

Validity, Reliability and Trustworthiness

Content validity was assessed through expert review involving specialists in educational research, psychology, counselling and mental health. The review examined the relevance, clarity and adequacy of the instruments, with an S-CVI target of at least 0.90. Questionnaires were translated into Kiswahili and back-translated into English to maintain conceptual consistency.

Cognitive testing involving 15 students assessed item clarity and comprehension. A pilot study was conducted in five public senior schools excluded from the main study, involving approximately 150 students. Internal consistency was assessed using Cronbach's alpha and McDonald's omega, with coefficients of 0.70 or higher considered acceptable. Item-total correlations were also examined. Recent psychometric evidence on the MSPSS, including Pina et al. (2025), informed its application in assessing perceived social support.

Qualitative trustworthiness was strengthened through triangulation, an audit trail, reflexive memos and member checking. A second researcher independently coded 20% of the transcripts to examine consistency in interpretation.

Data Analysis Techniques

Quantitative data were analysed using SPSS and appropriate statistical procedures for longitudinal observational data. Frequencies, percentages, means and standard deviations summarised participant characteristics, sources of support and suicidal ideation severity.

The primary outcome was the difference in SIQ-JR scores at six months between students receiving high-intensity structured support and those receiving low-intensity or usual support. Baseline differences were examined using standardised mean differences.

Confounding by indication was addressed using stabilised inverse-probability-of-treatment weighting (IPTW). The propensity score model included sex, age, class level, boarding status, previous suicide attempts, depressive symptoms, perceived

burdensomeness, thwarted belongingness and baseline suicidal ideation severity. Extreme weights were truncated at the first and 99th percentiles. Inverse-probability-of-censoring weighting (IPCW) addressed potential bias arising from loss to follow-up.

The primary effect was estimated using weighted least squares regression adjusted for baseline SIQ-JR scores. School-clustered robust standard errors accounted for within-school similarities, while confidence intervals used 23 degrees of freedom. The effect size was standardised using the baseline standard deviation.

Remission was analysed using weighted logistic regression. Suicide attempts were examined descriptively because their frequency was insufficient for reliable statistical inference.

Mediation analysis examined whether perceived burdensomeness and thwarted belongingness explained part of the relationship between support intensity and six-month suicidal ideation severity. Changes in these factors between baseline and three months were examined as parallel mediators. Indirect effects were estimated using the product-of-coefficients approach and 2,000 school-level cluster-bootstrap resamples.

Moderation analysis examined variations in the relationship according to selected student characteristics. Comparisons of individual support sources were adjusted using the Holm procedure. Sensitivity analyses examined alternative weighting specifications and potential unmeasured confounding using the E-value approach.

Qualitative data were analysed using reflexive thematic analysis, involving familiarisation, coding, theme development, review and interpretation. NVivo facilitated data organisation. Quantitative and qualitative findings were integrated through joint displays to establish convergence, divergence and complementarity.

Ethical Considerations

The study adhered to ethical principles governing research involving human participants, particularly adolescents experiencing suicidal risk. Ethical approval was obtained from the relevant university research ethics committee, and a research permit was obtained from NACOSTI. Authorisation was also obtained from the relevant county and education authorities and heads of participating schools.

Written informed consent was obtained from parents or guardians of participants below 18 years, while student assent was obtained before participation. Participants aged 18 years and above provided their own informed consent. Participation was voluntary, and confidentiality was maintained throughout the study.

A safety protocol guided the management of students identified as exhibiting suicidal risk behaviours and ideation. Students received risk assessment and appropriate safety planning. Those assessed as being at imminent risk were not left alone and were referred for urgent professional assessment and emergency care, with appropriate guardian notification. No participant was denied support because of study participation.

Research assistants received training in safe communication, confidentiality and referral procedures. Electronic data were protected through encryption and coded identifiers. Data handling followed the Kenya Data Protection Act, 2019.

Results and Discussion

Participant flow and baseline characteristics

The study screened students from 24 sampled public schools to identify those exhibiting suicidal risk behaviours and ideation. The recruitment and follow-up process is summarised in Figure 2. Figure 2 shows the flow of schools and students from screening to the twelve-month follow-up. A total of 24 schools participated, with 1,512 students screened for suicidal risk behaviours and ideation. Of these, 232 (15.3%) screened positive, while 1,280 (84.7%) screened negative. Following eligibility assessment, 192 students were enrolled, comprising 98 in the high-intensity support group and 94 in the low-intensity or usual support group. During follow-up, 183 (95%) participants completed the three-month assessment, 174 (91%) completed the six-month assessment and 159 (83%) completed the twelve-month assessment. The decline in participation over time indicates some loss to follow-up, although the study maintained a relatively high retention rate at twelve months. These findings are consistent with Kim (2021), who found that social support from caregivers and other sources was associated with lower odds of suicidal ideation among adolescents, highlighting the importance of sustained support from multiple sources in protecting young people against suicidal thoughts and related risks.

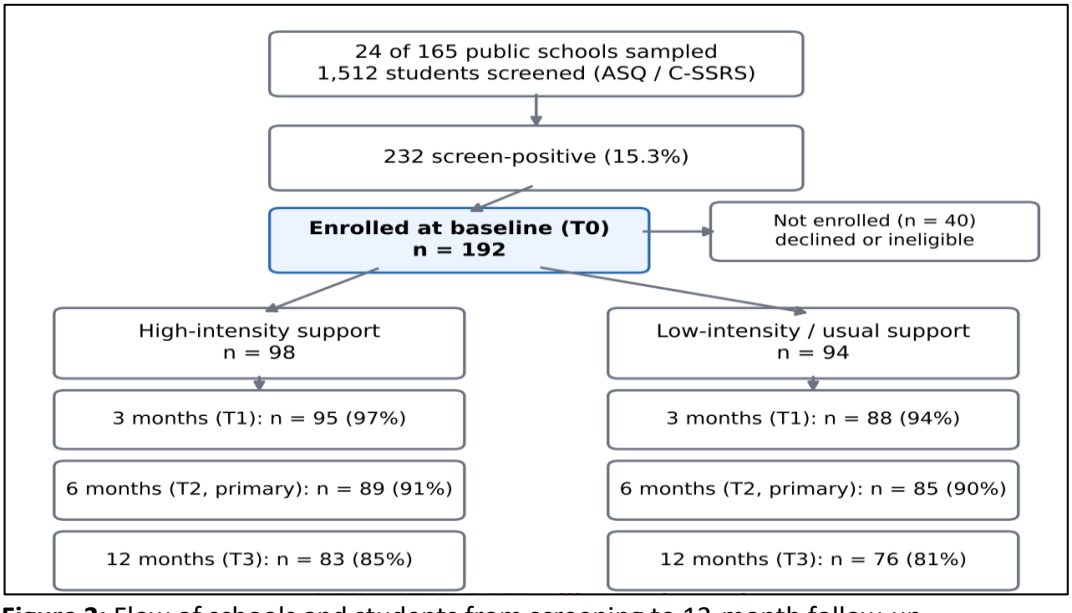

Figure 2: Flow of schools and students from screening to 12-month follow-up
Source: *Research data, 2026.*

Table 1 presents the baseline characteristics of students in the high-intensity and low-intensity or usual support groups before and after inverse probability of treatment weighting (IPTW). The two groups had comparable distributions in sex, age and history of previous suicide attempts, although some differences were observed in form level, boarding status and psychological characteristics. Before weighting, boarding status had the largest difference (SMD = -0.49), followed by thwarted belongingness (SMD = 0.28) and depressive symptoms (SMD = -0.24). After IPTW, all characteristics achieved adequate balance, with absolute SMD values below 0.10. The largest remaining

difference was in age (SMD = 0.05). This indicates that weighting successfully reduced baseline differences and improved comparability between the two groups, providing a stronger basis for assessing the relationship between social support intensity and changes in suicidal ideation and risk behaviours. This finding is consistent with Legazpi et al. (2022), who emphasised that propensity score weighting improves comparability between treatment groups by reducing observed baseline differences in observational studies.

Table 1: Baseline characteristics by support intensity and balance before and after weighting

Characteristic	High-intensity (n = 98)	Low-intensity / usual (n = 94)	SMD before	SMD after IPTW
Female, n (%)	37 (37.8%)	34 (36.2%)	0.03	0.02
Age, years, mean (SD)	16.2 (1.2)	16.0 (1.2)	0.16	0.05
Form 4, n (%)	21 (21.4%)	29 (30.9%)	-0.22	-0.03
Boarding, n (%)	53 (54.1%)	72 (76.6%)	-0.49	-0.02
Prior suicide attempt, n (%)	14 (14.3%)	15 (16.0%)	-0.05	-0.03
PHQ-A score, mean (SD)	13.4 (3.9)	14.4 (3.8)	-0.24	-0.00
INQ thwarted belongingness, mean (SD)	36.2 (8.2)	33.9 (7.5)	0.28	0.01
INQ perceived burdensomeness, mean (SD)	17.6 (5.7)	17.9 (6.1)	-0.05	0.01
SIQ-JR baseline, mean (SD)	39.9 (10.1)	37.9 (11.8)	0.18	0.03

Note: SMD = standardised mean difference; |SMD| < 0.10 indicates adequate balance. SIQ-JR = Suicidal Ideation Questionnaire-JR; INQ = Interpersonal Needs Questionnaire; PHQ-A = Patient Health Questionnaire for Adolescents.

Source: *Research data, 2026.*

Figure 3 illustrates the standardised mean differences (SMDs) in baseline characteristics between the high-intensity and low-intensity or usual support groups before and after inverse probability of treatment weighting (IPTW).

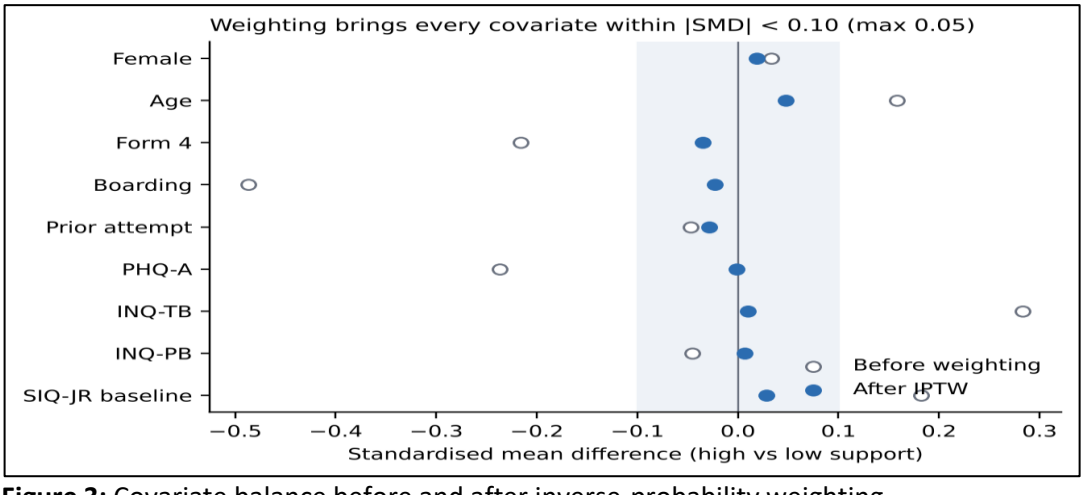

Figure 3: Covariate balance before and after inverse-probability weighting

Source: *Research data, 2026.*

Before weighting, noticeable differences existed in boarding status, form level, depressive symptoms and thwarted belongingness, with boarding status showing the largest imbalance. After weighting, all baseline characteristics fell within the acceptable balance range of |SMD| less than 0.10, with the maximum absolute SMD reducing to 0.05. This indicates that IPTW successfully reduced the observed differences between the two groups and improved their comparability. The findings highlight the importance of adjusting for baseline differences when assessing the influence of social support on suicidal ideation and risk behaviours. Consistent with this finding, Metekiya et al. (2022) emphasised that propensity score weighting helps reduce baseline imbalances between comparison groups in observational studies, thereby improving the reliability of estimated intervention effects.

Support received

The study examined the types, sources and frequency of social support received by students in the high-intensity and low-intensity or usual support groups during the first three months. The findings are presented in Table 2.

Table 2: Support received in the first three months

Support indicator	High-intensity (n = 98)	Low-intensity / usual (n = 94)
Counsellor support, n (%)	75 (76.5%)	11 (11.7%)
Peer support, n (%)	76 (77.6%)	13 (13.8%)
Teacher support, n (%)	62 (63.3%)	19 (20.2%)
Family support, n (%)	62 (63.3%)	8 (8.5%)
Number of sources, mean (SD)	2.8 (0.7)	0.5 (0.5)
Contacts in first 3 months, mean (SD)	8.5 (2.8)	2.0 (1.3)
Documented follow-up plan, n (%)	83 (84.7%)	11 (11.7%)

Source: *Research data, 2026.*

Primary outcome: suicidal ideation severity

The study compared changes in suicidal ideation severity between students receiving high-intensity and low-intensity or usual support at three, six and twelve months. The weighted and baseline-adjusted results are presented in Table 3.

Table 3: Weighted, baseline-adjusted differences in SIQ-JR by time point

Time point	n analysed	Mean, high-intensity	Mean, low-intensity	Adjusted difference (95% CI)	Cohen's d	p
3 months	183	32.7	35.6	-3.16 (-6.08 to -0.24)	-0.29	0.035
6 months (primary)	174	28.3	34.4	-6.10 (-9.87 to -2.33)	-0.56	0.003
12 months	159	26.8	32.7	-6.17 (-9.91 to -2.43)	-0.56	0.002

Note: negative differences favour high-intensity support. Weighted least squares with IPTW x IPCW, adjustment for baseline covariates, school-clustered robust SE, t-based 95% CI (23 df), d = difference / baseline SD.

Source: *Research data, 2026.*

Table 3 presents the weighted and baseline-adjusted differences in suicidal ideation severity between students receiving high-intensity and low-intensity or usual support at three, six and twelve months. The results show greater reductions in suicidal ideation among students receiving high-intensity support across all assessment periods. The adjusted difference increased from -3.16 points at three months to -6.10 points at six months, indicating a stronger effect with continued support. At twelve months, the difference remained at -6.17 points, suggesting that the improvement was sustained over time. The six-month results were statistically significant (p = 0.003), with a moderate effect size (d = -0.56). These findings demonstrate the importance of regular contact and coordinated support from multiple sources in reducing suicidal ideation among students at risk. Consistent with these findings, Teasdale-Dubé and Viau-Quesnel (2024) linked social support from caregivers and other sources to lower odds of suicidal ideation among adolescents because supportive relationships provide emotional security, reduce feelings of isolation and encourage help-seeking when experiencing psychological distress.

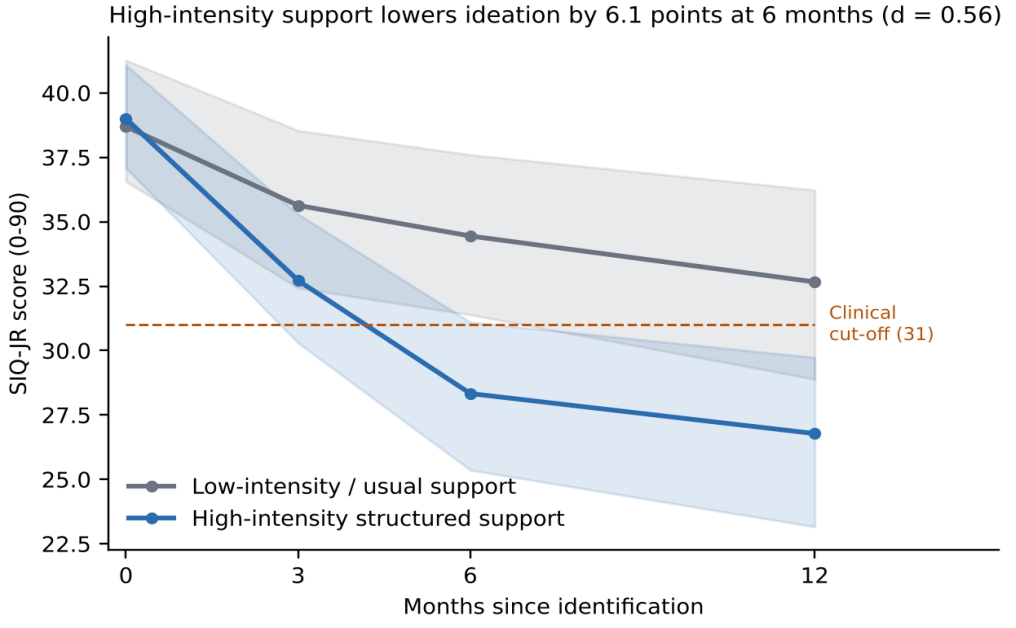

Figure 4: Weighted SIQ-JR trajectories by support intensity over 12 months

Figure 4 presents the trends in suicidal ideation severity among students receiving high-intensity structured support and those receiving low-intensity or usual support at baseline, three, six and twelve months. The results show greater reductions in suicidal ideation among students receiving high-intensity support across all assessment periods. The mean score declined from approximately 39 points at baseline to 32.7 at three months and 28.3 at six months, compared with 35.6 and 34.4 points, respectively, among students receiving low-intensity or usual support. At twelve months, the score further declined to 26.8 points in the high-intensity support group compared with 32.6 points in the low-intensity support group, indicating sustained improvement over time. Notably, students receiving high-intensity support recorded scores below the clinical cut-off of 31 by six months. The six-month adjusted

difference was statistically significant (p = 0.003), with a moderate effect size (d = -0.56). These findings demonstrate the importance of sustained and coordinated support in reducing suicidal ideation among students at risk. Consistent with these findings, Teismann et al. (2023) similarly demonstrated that strong social support was associated with lower odds of suicidal ideation among adolescents since it enhances emotional resilience and provides a protective buffer against psychological distress.

Secondary outcomes

The study examined two secondary outcomes at twelve months: remission from suicidal ideation and reported suicide attempts. The weighted and adjusted comparisons between the two support groups are presented in Table 4.

Table 4: Secondary binary outcomes at 12 months

Outcome	High-intensity	Low-intensity	Adjusted OR (95% CI)	p	NNT
Suicide attempt within 12 months	9.6%	4.6%	2.09 (0.60 to 7.27)	0.235	NA
Ideation remission at 12 months (SIQ-JR < 31)	63.7%	40.3%	3.55 (1.52 to 8.29)	0.005	4

Note: weighted logistic regression with clustered robust SE; NNT = number needed to treat (NA where the risk difference does not favour the exposure).
Source: *Research data, 2026*

Table 4 presents the secondary outcomes at twelve months, comparing ideation remission and suicide attempts between students receiving high-intensity and low-intensity or usual support. The findings show that 63.7% of students in the high-intensity group achieved ideation remission compared with 40.3% in the low-intensity group. This difference was statistically significant (adjusted OR = 3.55, 95% CI: 1.52–8.29, p = 0.005), with an estimated number needed to treat of four. However, suicide attempts were reported by 9.6% of students in the high-intensity group and 4.6% in the low-intensity group. This difference was not statistically significant (adjusted OR = 2.09, 95% CI: 0.60–7.27, p = 0.235). The wide confidence interval and small number of reported attempts limit the interpretation of this result. The findings suggest that high-intensity support was more clearly associated with improvement in suicidal thoughts than with changes in suicide attempts. Consistent with these findings, Zhu et al. (2022) found that school-based suicide prevention programmes reduced suicidal ideation and attempts by promoting early identification and timely support. Multiple stakeholders and sustained follow-up strengthened prevention through continued monitoring and support.

Mediation through interpersonal needs

The study examined whether changes in perceived burdensomeness and thwarted belongingness mediated the relationship between high-intensity social support and suicidal ideation severity at six months. The total, direct and indirect effects of social support through these interpersonal needs are presented in Table 5.

The results indicate that 36% of the total effect was mediated through changes in perceived burdensomeness and thwarted belongingness.

Table 5: Total, direct and indirect effects of high-intensity support on SIQ-JR at 6 months

Effect	Estimate (SIQ-JR points)	95% bootstrap CI
Total effect of high-intensity support	-6.10	-9.69 to -2.76
Direct effect	-3.93	-7.53 to -0.19
Indirect via thwarted belongingness	-0.61	-2.11 to 0.34
Indirect via perceived burdensomeness	-1.56	-3.20 to -0.46
Total indirect effect	-2.18	-4.64 to -0.36

Note: product-of-coefficients with 2,000 school-level cluster-bootstrap resamples; weights held fixed.

Source: *Research data, 2026.*

Perceived burdensomeness had a larger and statistically significant indirect effect (-1.56, 95% CI: -3.20 to -0.46), while the pathway through thwarted belongingness was not statistically significant (-0.61, 95% CI: -2.11 to 0.34). The total indirect effect was significant (-2.18, 95% CI: -4.64 to -0.36), although a direct effect remained (-3.93, 95% CI: -7.53 to -0.19). This suggests that reduced feelings of being a burden partly explain the association between high-intensity support and lower suicidal ideation, while other pathways may also contribute. Consistent with this finding, Waraan et al. (2023) found that perceived burdensomeness mediated the relationship between anxiety symptoms and suicidal ideation among adolescents, supporting its role as an important pathway associated with suicidal thoughts. However, the present mediation estimates indicate possible pathways rather than proven causal mechanisms because the mediators were not randomly assigned.

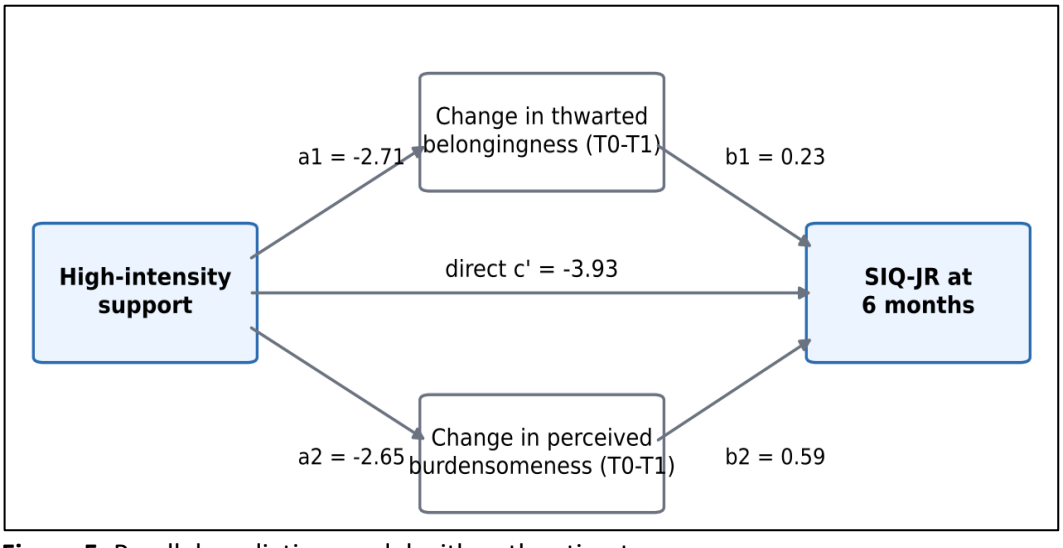

Figure 5: Parallel mediation model with path estimates

Source: *Research data, 2026.*

Figure 5 illustrates the pathways through which high-intensity support relates to suicidal ideation severity at six months through changes in thwarted belongingness and perceived burdensomeness. The results indicate that high-intensity support was associated with reductions in thwarted belongingness (a1 = -2.71) and perceived burdensomeness (a2 = -2.65). Both

mediating variables were positively associated with suicidal ideation severity, with perceived burdensomeness showing a stronger association (b2 = 0.59) than thwarted belongingness (b1 = 0.23). The direct effect of high-intensity support on suicidal ideation remained negative (c' = -3.93), indicating that greater support was associated with lower suicidal ideation even after accounting for the two interpersonal factors. These findings are consistent with Phillip et al. (2022), who established that perceived burdensomeness was associated with suicidal ideation among adolescents because feelings of being a burden can intensify emotional distress, hopelessness and thoughts of suicide.

Moderators and support sources

The study examined whether the association between high-intensity social support and suicidal ideation severity differed according to students' sex, residence and form level. The subgroup estimates and interaction tests at six months are presented in Table 6.

Table 6: Exploratory subgroup effects of high-intensity support at 6 months

Moderator	Subgroup	n	Adjusted difference (95% CI)	p (interaction)
Sex	Female	61	-5.54 (-14.77 to 3.69)	
Sex	Male	113	-6.60 (-11.33 to -1.87)	0.816
Residence	Boarding	117	-6.49 (-9.98 to -3.01)	
Residence	Day	57	-3.30 (-9.94 to 3.34)	0.595
Form level	Form 4	45	1.24 (-5.59 to 8.06)	
Form level	Grade 10 & Form 3	129	-8.78 (-13.42 to -4.13)	0.017

Note: weighted estimates within subgroup, clustered robust SE
Source: *Research data, 2026.*

Table 6 presents the exploratory subgroup effects of high-intensity support on suicidal ideation severity at six months. The results show that high-intensity support was associated with lower suicidal ideation among male students, boarding students and those in Grade 10 & Form 3. However, the association was not evident among female students, day students and Form 4 students. The interaction between support intensity and form level was statistically significant (p = 0.017), suggesting that the association differed by form level. This may reflect examination-related pressure among Form 4 students, which could limit the benefits of social support when academic demands remain high. However, the finding was exploratory and did not remain statistically significant after Holm adjustment (p = 0.051). Consistent with this explanation, Ndetei et al. (2024) found that academic stress was associated with higher suicidal ideation among adolescents, while a stronger sense of community was associated with lower ideation, suggesting that social support may need to be accompanied by measures addressing academic pressure.

The findings show that high-intensity social support was associated with lower suicidal ideation severity among male students, boarding students and students in Grade 10 & Form 3. However, the associations were not statistically significant among female students, day students and Form 4 students. The interaction tests showed no significant differences by sex (p = 0.816) or residence (p = 0.595). However, the interaction by form level was statistically

significant (p = 0.017), suggesting that the association between support intensity and suicidal ideation severity differed according to students' form level. The stronger negative association observed among Grade 10 & Form 3 students may reflect their greater reliance on peer relationships and school-based support as they adjust to the school environment and develop coping skills. This explanation is supported by Park (2024), who found that peer support and close friendships were associated with lower suicidal ideation because they provide emotional support, promote a sense of belonging and reduce loneliness.

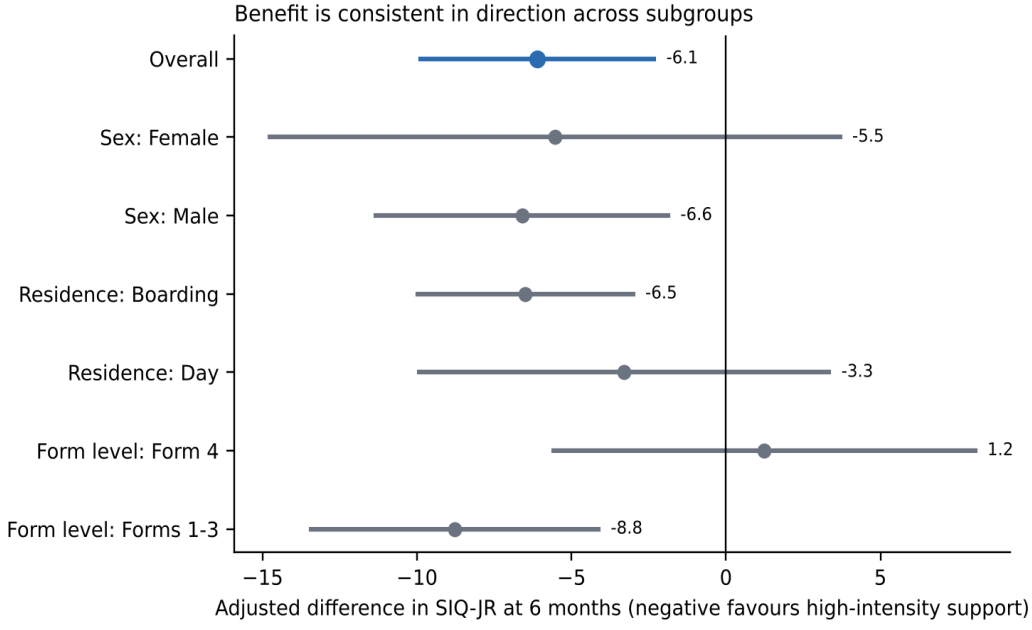

Figure 6: Forest plot of overall and subgroup effects on SIQ-JR at 6 months
Source: *Research data, 2026.*

The study examined the individual associations of counsellor, peer, teacher and family support with suicidal ideation severity at six months. The adjusted estimates and corresponding significance tests, including Holm-adjusted p-values, are presented in Table 7.

Table 7: Association of each support source with SIQ-JR at 6 months

Support source	Adjusted difference (95% CI)	p	Holm-adjusted p
Counsellor	-3.35 (-6.58 to -0.11)	0.043	0.086
Peer	-4.46 (-7.23 to -1.70)	0.003	0.011
Teacher	-0.87 (-3.72 to 1.98)	0.534	0.534
Family	-5.20 (-8.74 to -1.66)	0.006	0.017

Source: *Research data, 2026.*

Table 7 presents the adjusted associations between individual support sources and suicidal ideation severity at six months. Peer support (-4.46, p = 0.003) and family support (-5.20, p = 0.006) had statistically significant associations with lower suicidal ideation, and both remained significant after Holm adjustment. Counsellor support showed a nominal association (p = 0.043), but this

was not significant after adjustment (p = 0.086), while teacher support had no statistically significant association (p = 0.534). These findings suggest that peer and family relationships may provide important emotional connection and a sense of belonging for students experiencing suicidal distress. Bilello et al. (2024) similarly found that peer relationships are important sources of support for young people experiencing self-harm thoughts and behaviours. The findings support strengthening peer and family support while maintaining access to professional counselling.

Sensitivity analyses

The study conducted sensitivity analyses to assess whether the estimated association between high-intensity support and suicidal ideation severity at six months remained consistent across different analytical approaches. The results from the primary weighted model and alternative specifications are presented in Table 8.

Table 8: Sensitivity analyses for the 6-month effect on SIQ-JR

Specification	n	Adjusted difference (95% CI)	Cohen's d
Primary: IPTW x IPCW, adjusted	174	-6.10 (-9.87 to -2.33)	-0.56
IPTW only (complete cases)	174	-6.23 (-9.88 to -2.59)	-0.57
Unweighted, covariate-adjusted	174	-6.50 (-10.02 to -2.98)	-0.59
Crude (unadjusted)	174	-5.98 (-10.62 to -1.34)	-0.54

Source: Research, 2026.

Table 8 presents the sensitivity analyses for the six-month effect of high-intensity support on suicidal ideation severity. The estimates remained consistent across all four analytical approaches, ranging from -5.98 to -6.50 SIQ-JR points. The primary model estimated a difference of -6.10 points (95% CI: -9.87 to -2.33), while the effect sizes ranged from -0.54 to -0.59. The consistency of these estimates suggests that the observed association was not substantially affected by the choice of analytical specification. The E-value of 2.70 further suggests some resistance to unmeasured confounding, provided it was calculated using an appropriate risk-ratio scale. Rahman et al. (2022) explain that E-values help assess the strength of unmeasured confounding required to explain away an observed association in observational studies. However, sensitivity analyses cannot eliminate all possible sources of bias.

Qualitative Strand and Integration

The qualitative findings were analysed to explain and complement the quantitative results on the relationship between multi-source social support and suicidal ideation among at-risk Senior School students. Six themes emerged from the analysis: being known and cared for, not being a burden, trust and confidentiality, continuity and follow-up, examination-year pressure and barriers to implementation. These themes were integrated with the quantitative findings to explain the mediation pathways, differences across support sources, subgroup variations and challenges affecting access to assistance. The integrated findings are presented in Table 9.

Being known and cared for (belongingness). This theme highlights the importance of students feeling accepted, recognised and connected to people around them. Supportive relationships with peers, family members and teachers may reduce isolation and

strengthen students' sense of belonging. This helps explain the association between multi-source supports and reduced suicidal ideation, although the indirect pathway through thwarted belongingness was not statistically significant. Udupa et al. (2023), in a study involving 436 adolescents, found that lower belongingness was associated with higher suicidal ideation at both short- and longer-term follow-up. However, belongingness did not significantly mediate the intervention effect, suggesting that its contribution may depend on the type and continuity of social relationships.

Table 9: Integration of Qualitative Themes with Quantitative Findings

Qualitative theme	Link to quantitative findings	Integrated interpretation
Being known and cared for (belongingness)	Mediation through thwarted belongingness	Students' experiences of acceptance, inclusion and connection help explain how supportive relationships may reduce isolation. The weaker indirect pathway suggests that belongingness may not change equally across different relationships and social environments.
Not being a burden (perceived burdensomeness)	Mediation through perceived burdensomeness	Feeling valued, accepted and supported may reduce guilt and the belief that personal difficulties impose a burden on others. This helps explain the larger indirect effect through perceived burdensomeness.
Trust, confidentiality and stigma	Differences in associations across peer, family and teacher support	Trust and confidentiality influence students' willingness to disclose suicidal thoughts and seek assistance. Fear of judgement, gossip or breaches of privacy may discourage disclosure and affect the choice of support provider.
Continuity and follow-up	Number of support contacts and documented follow-up plans	Regular communication and consistent follow-up allow students' needs to be monitored and assistance to continue when difficulties persist. This helps explain the association between greater support contact and lower suicidal ideation.
Examination-year pressure	Difference in support effects between Form 4 and Grade 10 & Form 3	Academic workload, examination expectations and fear of poor performance may increase psychological distress and limit students' ability to benefit from available support.
Barriers to implementation	Loss to follow-up and lower levels of support in the low-intensity or usual support group	Limited counselling resources, inadequate training, stigma, confidentiality concerns and weak coordination may affect access to consistent support and the implementation of school-based interventions.

Source: Research data, 2026.

Not being a burden (perceived burdensomeness). This theme reflects students' need to feel valued, accepted and comfortable seeking assistance without believing that their difficulties inconvenience others. Support from family members, peers and counsellors may reassure students that their

challenges are understood and that help is available. This interpretation is consistent with the quantitative finding that perceived burdensomeness accounted for the larger indirect effect in the mediation analysis. Sultana et al. (2023) found that higher perceived burdensomeness predicted higher suicidal ideation among adolescents, supporting its relevance as an interpersonal factor in understanding suicidal thoughts. The findings therefore suggest that support approaches should address not only students' social connections but also negative beliefs about their value to others.

Trust, confidentiality and stigma. This theme demonstrates how students' confidence in support providers influences their willingness to disclose suicidal thoughts and seek assistance. Fear of judgement, gossip and disclosure of personal information without consent may discourage students from approaching teachers or counsellors. These concerns may help explain why peer and family support showed stronger associations with reduced suicidal ideation than teacher support alone. Oh et al. (2024), in a qualitative evidence synthesis of school-going adolescents in Sub-Saharan Africa, identified stigma, mistrust, confidentiality concerns and fear of negative reactions as major barriers to mental health help-seeking. This supports the need for confidential, non-judgemental and trustworthy support systems within schools.

Continuity and follow-up. This theme emphasises the importance of maintaining contact with students beyond the initial identification of suicidal risk. Regular communication, planned follow-up and coordinated assistance allow students' needs to be monitored and support to continue when difficulties persist. This complements the quantitative findings, which showed more support contacts and documented follow-up plans in the high-intensity group, alongside lower suicidal ideation at six months. Mortier et al. (2025), in a mixed-methods implementation study across 149 public high schools in Kenya, identified clear risk-management procedures and supervisory support as important facilitators of school-based mental health support. These findings reinforce the value of structured follow-up, clear responsibilities and appropriate referral procedures.

Examination-year pressure. This theme explains how academic workload, examination expectations and fear of poor performance may affect students' psychological well-being and their ability to benefit from social support. The weaker association observed among Form 4 students suggests that emotional support alone may be insufficient when students experience substantial academic demands. Lee et al. (2024), in a longitudinal study of 4,714 adolescents, found that higher academic pressure was associated with increased depressive symptoms and greater odds of self-harm. This suggests that support for examination-year students may be strengthened by combining counselling and emotional assistance with practical academic support, manageable workloads and appropriate examination preparation.

Barriers to implementation. This theme concerns challenges that may limit the availability, consistency and quality of school-based support. These include inadequate counselling resources, limited staff training, stigma, confidentiality concerns and weak coordination between schools and families. Such barriers may contribute to differences in the support students receive and difficulties maintaining contact over time. Fu et al. (2023) identified confidentiality concerns and referral gaps as implementation

challenges in school-based risk management across Kenyan public high schools. The study also identified supervisory support and clear protocols as important facilitators. These findings support strengthening staff capacity, referral systems and coordination between schools, families and mental health professionals.

Integration of qualitative and quantitative findings. Bringing the two strands together provides a broader understanding of how social support relates to suicidal ideation. The quantitative results established differences in suicidal ideation across support intensity, identified perceived burdensomeness as an important mediation pathway and showed variation across support sources and student subgroups. The qualitative themes provide explanations through students' experiences of acceptance, trust, academic pressure and continued assistance. Lee et al. (2024) found that peer and parent support were associated with lower suicidal ideation severity among community adolescents, although the associations were not significant in their clinical sample. This comparison suggests that the relationship between support and suicidal ideation may depend on students' circumstances and level of psychological need. The integrated findings therefore support a multi-source approach that combines trusted relationships, professional counselling, regular follow-up and attention to academic and institutional barriers.

Conclusion

The study found that high-intensity multi-source social support was associated with greater reductions in suicidal ideation than low-intensity or usual support. Students receiving high-intensity support were also more likely to achieve remission from suicidal ideation. However, no statistically significant reduction in suicide attempts was established. Perceived burdensomeness emerged as an important mediation pathway, while peer and family support showed stronger associations with reduced suicidal ideation than teacher support alone.

The study concludes that effective school-based suicide prevention requires coordinated support from peers, families, teachers and professional counsellors. Schools should strengthen confidential counselling, regular follow-up, early identification and referral systems while addressing academic pressure and barriers to accessing support.

Recommendations

Principals should establish coordinated support systems with individual support plans, assigned responsibilities, follow-up arrangements and clear referral pathways for at-risk students.

Counsellors and teachers should strengthen early identification, regular follow-up and timely referral. Peer support should operate under professional supervision and clear safeguarding procedures.

Parents and guardians should work with schools to provide emotional support, maintain open communication and facilitate timely assistance.

Education authorities should strengthen school mental health services through counsellor training, referral partnerships and confidential monitoring of student support.

Future studies should use larger samples and longer follow-up periods to examine the relationship between structured social support and suicide attempts. They should also investigate differences across school levels and support sources.

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