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Impact of Tailored Interventions on Suicidal Ideation Recovery: Addressing Hopelessness Among Economically Vulnerable Populations During COVID-19 Period

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ABSTRACT

Background: Public health crises—most recently exemplified by the coronavirus disease 2019 (COVID-19) pandemic—cause widespread psychological, social, and economic disruptions, contributing to increased depression, anxiety, and suicidal ideation rates. This study aims to examine the clinical characteristics and treatment outcomes of individuals who attempted suicide during the COVID-19 pandemic, focusing on the effectiveness of tailored interventions for economically vulnerable individuals.

Methods: This study was conducted as part of the “Post-management Service for Suicide Attempters in the Emergency Room” project. Overall, 93 individuals who had attempted suicide were recruited, with 49 completing the study. Participants were categorized based on economic status (vulnerable vs. general) and suicide attempt timing (during vs. after COVID-19). The intervention included structured counseling sessions (six and four sessions for the vulnerable and general group, respectively). The vulnerable group received two additional sessions tailored to individual needs, choosing from family counseling, mental health education, social skills training, or vocational rehabilitation. Clinical assessments—Beck Scale for Suicidal ideation (BSS), Beck Hopelessness Scale (BHS), Beck Depression Inventory-II, and Beck Anxiety Inventory—were conducted at baseline and follow-up, with statistical analyses using linear regression, mixed-effects analysis of variance, and Pearson correlation.

Results: Changes in BSS scores negatively correlated with baseline BHS scores ($B = -0.841$, $\beta = -0.593$, $P = 0.009$) and intervention type ($B = -4.596$, $\beta = -0.296$, $P = 0.040$). During the COVID-19 intervention period, BSS scores improved greatly in the vulnerable group than in the general population group ($F = 4.324$, $P = 0.049$). Post-COVID-19, no significant group differences were observed in outcome measures. Changes in BSS scores positively correlated with changes in BHS scores across the total study population ($r = 0.567$, $P < 0.001$), general population group ($r = 0.485$, $P = 0.016$), and vulnerable population group ($r = 0.641$, $P = 0.001$).

Conclusion: Tailored interventions were associated with reduced suicidal ideation, particularly among economically vulnerable individuals during the COVID-19 pandemic. Addressing hopelessness emerged as a key mechanism in suicide prevention. The observed enhancement during the pandemic highlights the importance of context-sensitive strategies in public health crises. Further research using larger, randomized controlled trials is warranted.

Disclosure

The authors have no potential conflicts of interest to disclose.

Data Sharing Statement

Data sharing statement is provided in

Supplementary Data 1.

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Keywords: Suicidal Ideation; Psychosocial Intervention; Suicide Prevention; Socioeconomic Factors; COVID-19

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic, rapidly spread worldwide, causing severe public health and economic crises. Studies show that infectious disease outbreaks have widespread psychological and socioeconomic impacts,^{1,2} including depression, anxiety, and suicidal ideation. Prolonged infectious disease outbreaks³⁻⁵ further limit access to psychological services, exacerbating the mental health crisis.⁶

Social distancing, an effective strategy for preventing the spread of the virus, is a major risk factor for mental health problems, including social withdrawal and family conflicts.⁷⁻⁹ The prolonged economic downturn from COVID-19 has raised concerns about the direct and indirect effects of financial hardship on mental health.¹⁰⁻¹² Economic instability is a known risk factor for stress-related disorders and suicide, with studies linking unemployment to higher rates of depression, substance abuse, and suicide mortality.¹³⁻¹⁶

Evidence from previous outbreaks links public health crises to increased psychological distress. During the 2003 severe acute respiratory syndrome outbreak in Hong Kong, quarantined patients reported significantly higher stress levels, health concerns, social fear, financial insecurity, sleep disturbances, depression, loneliness, impaired concentration, and compromised judgment.¹⁷ Similarly, the psychological impact of COVID-19 is expected to persist beyond its peak, with higher suicide rates and mental health issues among COVID-19 survivors and vulnerable groups. This underscores the urgent need for interventions to mitigate stress, anxiety, fear, and loneliness among at-risk individuals.

This study aims to evaluate the effectiveness of tailored interventions for individuals who attempted suicide during the COVID-19 pandemic, with a focus on economically vulnerable populations. We hypothesized that tailored interventions would lead to greater reductions in suicidal ideation than those of standard interventions. The findings could clarify how economic vulnerability and public health crises influence intervention outcomes and inform targeted suicide prevention strategies for high-risk populations.

METHODS

Study participants

The study was conducted between August 2021 and August 2023 at the Chung-Ang University Hospital (CAUH) in Seoul, South Korea. This study was conducted as part of the services independently provided by CAUH, within the framework of the “Post-management Service for Suicide Attempters in the Emergency Room” project, which has been operated by the Ministry of Health and Welfare and the Korea Foundation for Suicide Prevention at regional emergency medical centers. Participants were recruited from the emergency department and the psychiatric outpatient clinic following a suicide attempt.

The inclusion criteria were as follows: 1) adults (aged ≥ 19 years) presenting to the emergency department or psychiatric outpatient clinic following a suicide attempt who agreed to aftercare services, and 2) individuals at high risk of suicide, characterized by persistent suicidal ideation with a concrete suicide plan, who agreed to receive aftercare services. The exclusion criterion was as follows: Individuals unable to provide informed consent or complete assessments due to cognitive impairment or communication difficulties.

Participants were classified into four groups based on hospital visit timing (during vs. after the COVID-19 pandemic) and socioeconomic status (SES, vulnerable vs. general population), using the Ministry of Employment and Labor criteria for economic vulnerability. The four groups were as follows: 1) Group 1: General population individuals who presented during the COVID-19 pandemic. 2) Group 2: Economically vulnerable individuals who presented during the COVID-19 pandemic. 3) Group 3: General population individuals who presented after the COVID-19 pandemic. 4) Group 4: Economically vulnerable individuals who presented after the COVID-19 pandemic.

Participants were enrolled within a week of the hospital presentation after providing informed consent for case management and the study. Baseline assessments were conducted in person or remotely (via telephone or an online survey platform). Follow-up assessments were completed within 1 week after the termination of case management services through in-person or remote methods. Participants unable to complete the in-person assessments could complete them via 1) a structured telephone interview conducted by a research staff member or 2) an online survey link sent via text message.

Intervention

All participants completed baseline assessments, including self-reported questionnaires and interviews, taking approximately 30 minutes. The intervention protocol was tailored based on SES. Those in the general population groups (Groups 1 and 3) received structured counseling once per week, with each session lasting 30–60 minutes for four sessions. In contrast, participants in the economically vulnerable groups (Groups 2 and 4) received structured counseling once per week for six sessions, with each session also lasting 30–60 minutes.

All participants underwent a standard intervention comprising four structured counseling sessions on suicide risk assessment, crisis stabilization, and mental health and community resource engagement (**Supplementary Table 1**). Detailed descriptions of the structure and content of the interventions are provided in the Supplementary materials. Participants in the economically vulnerable group received two additional sessions tailored to their individual needs, with options including the following: 1) family counseling (**Supplementary Table 2**), 2) mental health education (**Supplementary Table 3**), 3) social skills training (**Supplementary Table 4**), or 4) vocational rehabilitation (**Supplementary Table 5**). After completing the intervention, all participants underwent follow-up assessments using the same questionnaires and interviews as at baseline assessment.

Modules were based on evidence-based theories (**Supplementary Table 6**).¹⁸ Specifically, the psychoeducational components were grounded in cognitive-behavioral and stress-coping models, focusing on identifying maladaptive thoughts, managing stress, and developing adaptive coping strategies.^{19,20} Family counseling was informed by family systems theory, emphasizing communication patterns, role dynamics, and collaborative problem-solving within families.²¹ Social skills training and vocational support were based on rehabilitation

and recovery-oriented frameworks, designed to enhance functional capacity, promote autonomy, and facilitate reintegration into community and occupational roles.^{22,23} The intervention followed standardized protocols delivered by trained professionals, with fidelity ensured through regular supervision (**Supplementary Table 7**).

Measurements

Baseline assessments included demographic and clinical data, such as age, sex, education level, occupation, financial status, psychiatric history, and past suicide attempts. Information related to the emergency department visit, including suicide attempt details, medical severity, and post-discharge plans, was also collected.

Before the intervention, all participants completed assessments on emotional changes and suicidal behavior related to the COVID-19 pandemic. Psychological measures included the Korean version of the Beck Depression Inventory-II (K-BDI-II), Beck Anxiety Inventory (K-BAI), Beck Hopelessness Scale (K-BHS), and Beck Scale for Suicidal Ideation (K-BSS). After the intervention, all participants were reassessed using these measures for changes in depression, anxiety, hopelessness, and suicidal ideation.

BDI-II

The BDI-II is a 21-item self-report instrument that assesses depression severity in adolescents and adults. Each item is rated on a 4-point scale (0–3), with higher total scores indicating more severe depression. The BDI-II has demonstrated high internal consistency and test-retest reliability across diverse populations, making it a widely used tool in clinical and research settings.²⁴

BAI

The BAI is a 21-item self-report questionnaire that measures anxiety severity. Each item describes a common symptom of anxiety and it is rated on a 4-point scale, from 0 (not at all) to 3 (severely). The BAI focuses on somatic symptoms of anxiety and has demonstrated good reliability and validity across clinical populations.²⁵

BHS

The BHS is a 20-item true-false self-report inventory that evaluates three major aspects of hopelessness: feelings about the future, loss of motivation, and expectations. It assesses negative attitudes toward the future and is a strong predictor of suicide risk, especially in individuals with depression.²⁶

BSS

The BSS is a self-report instrument that measures the severity of suicidal ideation by evaluating suicide-related attitudes and behaviors to help identify at-risk individuals. The BSS is widely used in clinical and research settings to assess suicidal intent and has strong psychometric properties.²⁷

Statistical analysis

Univariate analyses employed one-way analysis of variance (ANOVA) for continuous variables and chi-square tests for categorical variables. Linear regression was used to examine the effects of socio-demographics, psychological symptoms, the COVID-19 pandemic period, and intervention type on suicidal ideation improvement, with the changes in BSS scores (follow-up BSS score minus baseline BSS score) as the dependent variable. A mixed-effects

ANOVA was used to assess intervention effectiveness, with the intervention group (general vs. vulnerable) as a between-subject factor and time (baseline vs. follow-up) as a within-subject factor. We also conducted additional analyses of covariance (ANCOVA) for changes in each psychological scale (BDI-II, BAI, BHS, and BSS), using baseline scores as covariates to control for potential bias. This adjustment accounted for baseline differences between intervention groups, although none were statistically significant. Pearson correlation analyses were conducted to explore the relationships between psychological outcomes that significantly improved from baseline to follow-up, including BSS and BHS. Statistical significance was set at $\alpha = 0.05$ (two-sided). All analyses were conducted using the Complex Samples module in IBM SPSS Statistics, Version 28 (IBM Corp., Armonk, NY, USA).

Ethics statement

This non-randomized intervention study was approved by the Institutional Review Board of Chung-Ang University Hospital (approval No. 2142-004-461) and registered with the Clinical Research Information Service (<https://cris.nih.go.kr/>; Registration No: KCT0009463). This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Informed consent was obtained from all participants at the time of enrollment.

RESULTS

Participant characteristics

Overall, 93 patients were enrolled, with 49 completing the study (completion rate: 52.7%). Throughout the study period, no intervention-related adverse events occurred. Baseline sociodemographic and clinical characteristics did not differ significantly between the groups (Table 1). A dropout analysis revealed no systematic differences in baseline characteristics between completers and non-completers, mitigating concerns about attrition bias (Supplementary Table 8). Most dropouts were attributed to practical barriers or disengagement (e.g., scheduling conflicts, transportation issues, loss of contact, or personal circumstances) rather than adverse events.

Table 1. Baseline socio-demographic characteristics (N = 49)

Variables	During pandemic		After pandemic		F/ χ^2	P value
	Intervention-general (n = 14)	Intervention-vulnerable (n = 10)	Intervention-general (n = 13)	Intervention-vulnerable (n = 12)		
Age, yr	23.9 ± 4.4	23.4 ± 4.8	27.5 ± 5.5	29.9 ± 11.7	2.214	0.099
Sex (male/female) ^a	4/10	2/8	2/11	4/8	1.325	0.723
Methods (DI/cutting/etc.) ^a	4/5/5	4/3/3	8/3/2	4/4/4	3.582	0.733
Medical results (discharge/admission) ^a	9/5	9/1	11/2	10/2	2.992	0.393
Depressive mood	5.8 ± 3.0	4.7 ± 3.0	5.5 ± 3.0	6.6 ± 2.5	0.803	0.499
Anxiety	5.3 ± 2.7	5.3 ± 3.0	5.8 ± 3.3	6.6 ± 2.2	0.554	0.648
Anger	5.3 ± 3.1	6.7 ± 3.0	4.8 ± 3.1	6.8 ± 2.5	1.342	0.273
Frustration	5.4 ± 3.2	4.9 ± 3.2	5.2 ± 3.4	6.5 ± 2.6	0.582	0.630
BDI-II	33.4 ± 12.9	40.4 ± 10.8	34.1 ± 11.5	36.8 ± 13.7	0.756	0.525
BAI	22.9 ± 10.9	28.0 ± 12.7	25.4 ± 12.9	28.5 ± 13.2	0.550	0.650
BHS	13.3 ± 6.4	16.5 ± 3.9	14.1 ± 4.8	12.5 ± 6.1	1.063	0.374
BSS	19.3 ± 11.1	25.2 ± 7.3	22.5 ± 7.1	21.3 ± 10.4	0.822	0.489

Values are presented as mean ± standard deviation.

DI = drug intoxication, BDI-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, BHS = Beck Hopelessness Scale, BSS = Beck Scale for Suicidal ideation.

^aThe results are from χ^2 tests, while the remaining results are derived from one-way analysis of variance tests.

Table 2. Linear regression analysis of changes in suicidal ideation in response to intervention with the Beck Scale for Suicide ideation score as the dependent variable (N = 49)

Independent variables	Statistics of the variables			
	B	B	t	P
Age, yr	0.197	0.188	1.307	0.199
Sex (female)	-3.236	-0.180	-1.205	0.235
Previous suicidal attempts (yes)	-1.979	-0.122	-0.859	0.395
Baseline BDI-II, score	0.335	0.525	1.954	0.058
Baseline BAI, score	-0.217	-0.338	-1.836	0.074
Baseline BHS, score ^a	-0.841	-0.593	-2.730	0.009
COVID-19 pandemic period (after the pandemic)	-0.938	-0.061	-0.437	0.664
Intervention type (intervention-vulnerable ^b) ^a	-4.596	-0.296	-2.127	0.040
Statistics of the model ^a	F = 2.500 (P = 0.026), R ² = 0.333			

Dependent variable: changes of the BSS (BSS score at follow-up minus BSS score at baseline).

BDI-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, BHS = Beck Hopelessness Scale, COVID-19 = coronavirus disease 2019, BSS = Beck Scale for Suicidal ideation.

^aStatistically significant; ^bIntervention-vulnerable: intervention for vulnerable population.

Results from linear regression

Table 2 presents the linear regression results for the changes in suicidal ideation among the 49 patients who completed the study. Variables estimated in the linear regression explained 33.3% of the variance in BSS changes, which were negatively correlated with the baseline BHS scores ($B = -0.841$, $\beta = -0.593$, $P = 0.009$) and intervention type ($B = -4.596$, $\beta = -0.296$, $P = 0.040$).

Results from mixed-effects ANOVA

During the intervention period, the group receiving the intervention for the vulnerable population (Intervention-Vulnerable) showed significantly greater reductions in BSS scores than the group receiving the intervention for the general population (Intervention-General) ($F = 4.324$, $P = 0.049$, partial $\eta^2 = 0.164$; **Table 3**). BHS scores exhibited a trend-level reduction ($F = 3.607$, $P = 0.071$, partial $\eta^2 = 0.141$). However, during the post-COVID-19 intervention period, no significant group differences in score changes were observed. While baseline BSS scores were not significantly different across groups ($F = 0.822$, $P = 0.489$; **Table 1**), an ANCOVA was conducted to control for any potential baseline imbalances. This analysis revealed a trend-level difference in post-intervention BSS scores between the intervention groups (general vs. vulnerable) ($F = 2.69$, $P = 0.116$, partial $\eta^2 = 0.113$; **Supplementary Table 9**).

Table 3. Comparison of score changes in psychological scales between the general and vulnerable populations during and after the pandemic

Variables	Intervention-general ^a (n = 27)		Intervention-vulnerable ^b (n = 22)		Statistics (mixed ANOVA)		
	Baseline	Follow-up	Baseline	Follow-up	Group × time effect		
					F	P	Partial η^2
During the pandemic (n = 24)							
BDI-II	33.4 ± 12.9	23.3 ± 13.5	40.4 ± 10.8	24.9 ± 16.2	1.228	0.280	0.053
BAI	22.9 ± 10.9	17.6 ± 16.2	28.0 ± 12.7	17.7 ± 12.0	1.326	0.262	0.057
BHS	13.3 ± 6.4	12.3 ± 6.6	16.5 ± 3.9	11.3 ± 5.6	3.607	0.071	0.141
BSS ^c	19.3 ± 11.1	16.4 ± 10.7	25.2 ± 7.3	16.1 ± 10.2	4.324	0.049	0.164
After the pandemic (n = 25)							
BDI-II	34.1 ± 11.5	23.8 ± 12.7	36.8 ± 13.7	28.8 ± 16.3	0.183	0.673	0.008
BAI	25.4 ± 12.9	19.2 ± 14.6	28.5 ± 13.2	17.8 ± 12.0	0.852	0.366	0.036
BHS	14.1 ± 4.8	11.4 ± 6.9	12.5 ± 6.1	10.2 ± 6.7	0.023	0.881	0.001
BSS	22.5 ± 7.1	18.0 ± 6.6	21.3 ± 10.4	15.1 ± 10.2	0.273	0.606	0.012

Values are presented as mean ± standard deviation.

The results are from mixed ANOVA.

ANOVA = analysis of variance, BDI-II = Beck Depression Inventory-II, BAI = Beck Anxiety Inventory, BHS = Beck Hopelessness Scale, BSS = Beck Scale for Suicidal ideation.

^aIntervention-general: intervention for the general population; ^bIntervention-vulnerable: intervention for vulnerable population; ^cStatistically significant.

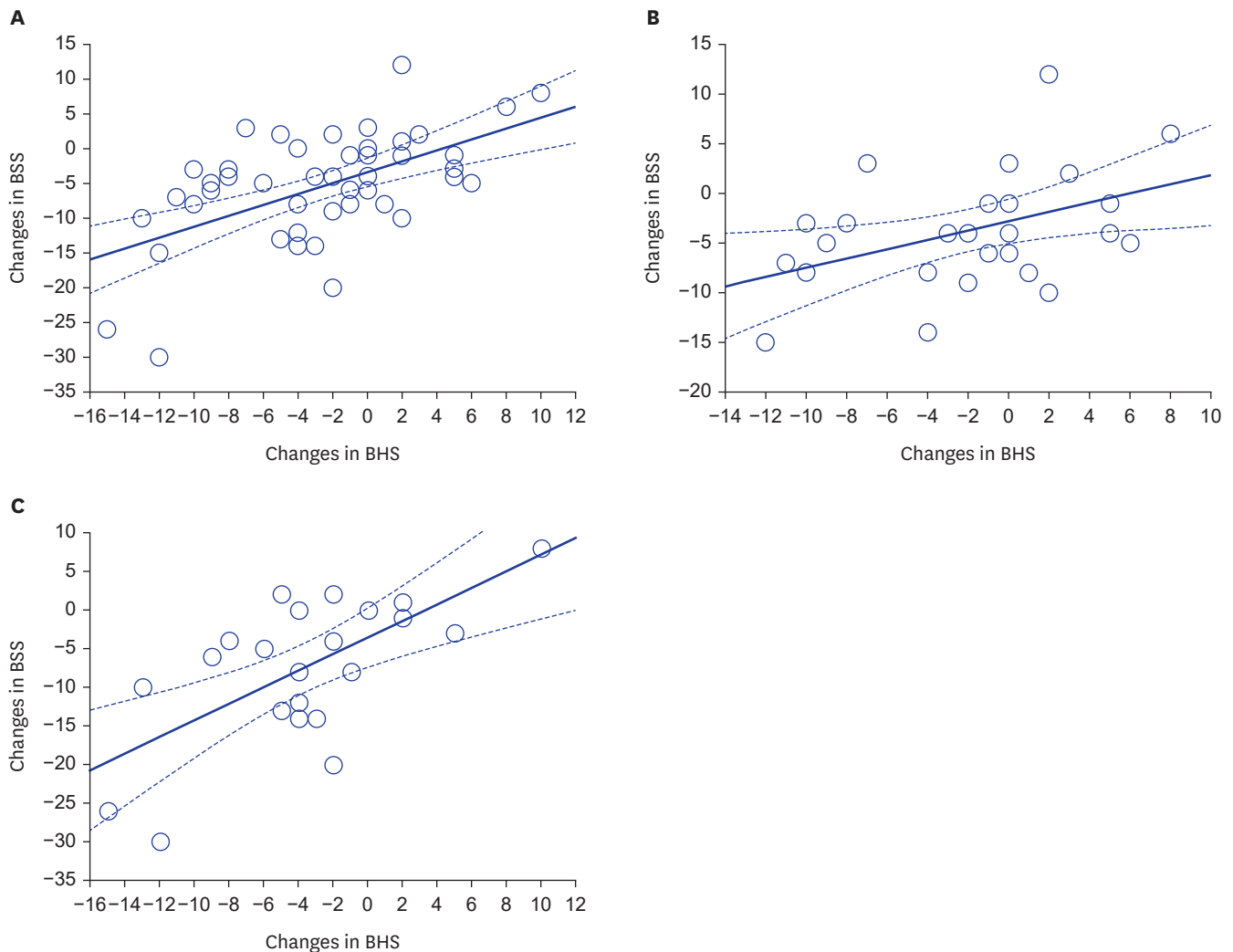


Fig. 1. Correlation between changes in hopelessness and suicidal ideation across population groups. **(A)** Correlations between the changes in BHS and changes in BSS in the total population, $r = 0.567$, $P < 0.001$. **(B)** Correlations between the changes in BHS and changes in BSS in the general population, $r = 0.485$, $P = 0.016$. **(C)** Correlations between the changes in BHS and changes in BSS in the vulnerable population, $r = 0.641$, $P = 0.001$. BHS = Beck Hopelessness Scale, BSS = Beck Scale for Suicidal ideation.

Results from Pearson correlation analysis

Changes in BSS scores positively correlated with changes in BHS scores among the total study population ($r = 0.567$, $P < 0.001$), general population ($r = 0.485$, $P = 0.016$), and vulnerable population ($r = 0.641$, $P = 0.001$; **Fig. 1**).

DISCUSSION

In this study, the effectiveness of tailored interventions in reducing suicidal ideation and hopelessness among individuals with a history of suicide attempts was evaluated, particularly emphasizing those from economically vulnerable backgrounds. Among the 49 participants, suicidal ideation decreased following the intervention, with a more pronounced reduction observed in the economically vulnerable group. Reductions in suicidal ideation were significantly linked to baseline hopelessness and intervention type. Although hopelessness

showed a trend toward improvement, this change was not statistically significant. Nonetheless, changes in suicidal ideation and hopelessness were positively correlated.

Linear regression analysis revealed a significant association between changes in suicidal ideation, baseline hopelessness, and intervention type. Specifically, individuals with higher baseline hopelessness experienced greater reductions in suicidal ideation, consistent with previous research linking hopelessness to persistent suicidality.²⁸ For instance, hopelessness was independently associated with suicidal ideation among Iranian medical students.²⁹ Moreover, BHS effectively predicted suicidal ideation among adolescents in Finland, showing good sensitivity and specificity.³⁰ Additionally, the intervention type—general or tailored for economically vulnerable groups—was significantly associated with changes in the levels of suicidal ideation. Participants in the vulnerable population group (who received the tailored intervention) exhibited greater reductions in suicidal ideation than those in the general population group, suggesting that the intervention may have greater potential effectiveness. Research indicates that access to free, reliable support services may help prevent mental health decline in vulnerable populations facing poverty, debt, and unemployment.³¹

Linear regression analysis further revealed that the intervention timing—during or after COVID-19—did not significantly affect reductions in suicidal ideation. However, mixed-effect ANOVA revealed that during COVID-19, the intervention was more effective for the vulnerable population in reducing suicidal ideation than for the general population. This difference in the level of improvement was not observed post-COVID-19. This suggests that the COVID-19 period did not uniformly influence intervention effectiveness for all patients. Rather, its impact varied based on individual characteristics, especially economic vulnerability and intervention type. Moreover, the lack of significant effects for age, sex, and past suicide attempts indicates that reductions in suicidal ideation were primarily driven by changes in hopelessness and intervention type.

Mixed-effects ANOVA revealed greater improvement in suicidal ideation among participants from the economically vulnerable group than those from the general population during the COVID-19 period, suggesting that tailored interventions may be more effective in reducing suicidal ideation among individuals experiencing greater socioeconomic stress. This finding aligns with previous research showing that financial hardship and social stressors exacerbate psychological distress, underscoring the need for targeted interventions for economically disadvantaged individuals during crises.³² Studies consistently show that economically vulnerable populations were negatively impacted mentally during COVID-19, highlighting the urgent need for tailored interventions to address mental health disparities.³³⁻³⁶ While many studies explored psychological interventions for patients and healthcare workers during the COVID-19 pandemic,³⁷⁻⁴⁰ few have specifically evaluated their effectiveness for economically disadvantaged populations.

The mixed-effects ANOVA indicated a trend-level improvement in hopelessness following the intervention, though it was not statistically significant, likely because of the small sample size limiting statistical power. Hopelessness, a complex and deeply ingrained cognitive-emotional state may require longer interventions or larger samples to observe statistically significant improvements.⁴¹ Research indicates that hopelessness improves more gradually than suicidal ideation, as it is influenced by persistent factors such as financial insecurity and social isolation.⁴¹ Larger studies with extended follow-up periods are necessary to better understand how tailored interventions reduce hopelessness in high-risk populations.

The intervention appeared more effective during the COVID-19 pandemic among economically vulnerable individuals, potentially due to heightened distress and receptiveness to psychosocial support. However, this interpretation should be viewed cautiously, as no group differences were observed post-pandemic, and the effect size attenuated when adjusting for baseline differences. This result may be attributed to the heightened distress and uncertainty during the pandemic, which likely increased receptiveness to psychological support. During a crisis, structured mental health support provides stability, helping individuals effectively manage acute distress and suicidal thoughts.³ Additionally, the pandemic increased mental health awareness and the expansion of crisis intervention services, potentially enhancing treatment effectiveness.⁴² The acute nature of the crisis likely motivated individuals to engage in interventions to cope with uncertainty and loss.⁴³ However, no significant differences in improvement were observed between the groups on any outcome measure after the pandemic. This shift may stem from the transition from acute crisis to long-term stressors—such as economic instability and social isolation—that psychological interventions alone may not fully address.⁴⁴

Pearson correlation analysis revealed a significant positive association between changes in hopelessness and suicidal ideation across all populations, including both vulnerable and general groups. This suggests that reducing hopelessness may help alleviate suicidal ideation. Similarly, a study on adolescents found that those facing economic hardship and experiencing hopelessness were at a higher risk of suicidal ideation.⁴⁵ Additionally, a study on patients with depression and other neurotic psychiatric disorders found a strong association between hopelessness and suicidal ideation, highlighting the influence of both social and economic factors alongside depression.⁴⁶

This study implemented a tailored intervention for economically vulnerable populations, effectively reducing hopelessness and, consequently, suicidal ideation. Its greater effectiveness in this group may be attributed to the additional therapeutic approaches addressing their unique psychosocial stressors. These included family counseling, mental health education, social skills training, and vocational rehabilitation, which likely enhanced emotional resilience and fostered a sense of purpose. Economically disadvantaged individuals often experience heightened stress from financial instability, social isolation, and limited access to mental health resources.^{47,48} These comprehensive interventions likely helped reduce hopelessness. Since psychosocial resources mediate or moderate the relationship between SES and health and tend to diminish as SES decreases,⁴⁹ enhancing these resources is a key strategy for mitigating the negative impact of low SES on health.

These findings have important clinical implications for suicide prevention. First, they underscore the need to address hopelessness in high-risk individuals, particularly those facing economic hardships. Second, the greater effectiveness of tailored interventions for economically vulnerable individuals suggests that interventions should address financial stressors, social isolation, and limited mental health access. Third, the differential impact of the intervention during the COVID-19 pandemic highlights the need for crisis-responsive mental health strategies. Mental health professionals and policymakers should integrate economic and social support into suicide prevention programs to enhance their effectiveness. Future research should explore scalable and sustainable intervention models adaptable to diverse socioeconomic settings.

Despite its strengths, this study has some limitations. First, its observational design and lack of randomization limit causal interpretation. Second, the small sample size ($n = 49$) may have reduced statistical power, especially for detecting changes in hopelessness. Nonetheless, dropout analysis revealed no significant baseline differences between completers and non-completers, mitigating concerns about attrition bias. Third, reliance on self-report measures may have introduced response biases such as social desirability and recall bias. Incorporating clinician-rated or objective behavioral assessments could enhance the validity of the findings. Fourth, while the intervention was structured, individual differences in engagement, adherence, and external support systems were not fully accounted for, potentially influencing outcomes. Fifth, the short follow-up period limited the assessment of the long-term intervention effects. Sixth, this study was conducted within a specific cultural and socioeconomic context, potentially limiting the generalizability of the findings to other populations. Finally, while baseline BSS scores did not significantly differ between groups, an ANCOVA was conducted to adjust for potential baseline imbalances. The adjusted analysis revealed only a trend-level difference in post-intervention BSS outcomes, indicating that group comparisons should be interpreted with caution. Future research should employ randomized controlled designs with larger samples and longer follow-up, and evaluate the effectiveness and scalability of tailored interventions across diverse cultural and socioeconomic contexts.

This study demonstrates that tailored interventions may contribute to reductions in suicidal ideation, particularly among economically vulnerable individuals. While the reduction in hopelessness was not statistically significant, its strong correlation with suicidal ideation highlights its relevance as a treatment target. The intervention was more effective during the COVID-19 period, potentially due to heightened socioeconomic stress; however, this effect did not persist in the post-pandemic period. Nevertheless, the lack of a control group limits the ability to draw causal inferences. These findings underscore the need for flexible, context-sensitive suicide prevention strategies. Further research using larger, randomized controlled trials is warranted.

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This study was conducted as part of the services independently provided by Chung-Ang University Hospital within the framework of the “Post-management Service for Suicide Attempters in the Emergency Room” project, operated by the Ministry of Health and Welfare and the Korea Foundation for Suicide Prevention at regional emergency medical centers.

SUPPLEMENTARY MATERIALS

Supplementary Data 1

Supplementary Table 1

Structure and content of the standard intervention¹

Supplementary Table 2

Specialized intervention modules for economically vulnerable participants – family counseling^{2,3}

Supplementary Table 3

Specialized intervention modules for economically vulnerable participants – mental health education⁴

Supplementary Table 4

Specialized intervention modules for economically vulnerable participants – social skills training^{4,5}

Supplementary Table 5

Specialized intervention modules for economically vulnerable participants – vocational rehabilitation (pre-employment)^{4,5}

Supplementary Table 6

Description of intervention modules and theoretical foundations

Supplementary Table 7

Fidelity monitoring checklist and procedures

Supplementary Table 8

Comparison of baseline characteristics between completers and non-completers (N = 93)

Supplementary Table 9

ANCOVA results for psychological scale score changes controlling for baseline scores

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