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Differences in Suicidal Pathways According to Adolescents' Interpersonal Sensitivity

Hyoung Soo Kim [1,*]

[1] Dankook University; Assistat Professor; hskim70@dankook.ac.kr
* Correspondence

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Abstract: *This study was conducted to analyze differences in pathways of suicide risk and the influence of related risk factors among adolescents based on their interpersonal sensitivity. To achieve this, a survey was conducted using data from 496 high school students in the metropolitan area, including their levels of suicide ideation and urges, suicide planning, suicide attempts, and their experiences of related risk factors. Path analysis and multigroup analysis were performed to analyze collected data. Results of the analysis showed that the group with high interpersonal sensitivity had significantly larger coefficients for pathways leading to suicide ideation and urges, suicide planning, and suicide attempts than the group with low interpersonal sensitivity.*

Keywords: Adolescent Suicide Crisis; Interpersonal Sensitivity; Suicidal Suicide Attempts; Path Analysis

1. Introduction

1.1 Background

This study was conducted with the aim of comparing pathway differences by considering the influence of interpersonal sensitivity as an underlying variable affecting adolescent suicidal crisis pathways. Interpersonal sensitivity is a variable that impacts both emotional and cognitive determinants as well as behavioral processes related to suicidal crises; however, it has been relatively underexplored in the psychological literature in connection with suicidal crises. This may be partly due to perceptions of interpersonal sensitivity as an innate temperament. In the medical field, however, the temperamental aspects of interpersonal sensitivity have been reported to adaptively improve under positive environmental conditions that emphasize flexibility [1]. The context for conducting this study arose from the need to assist counselors and teachers who encounter adolescents with similar types of suicidal crises but observe wide individual differences in distress levels and cases where previously effective interventions failed. The goal is to help these professionals better understand such variations and to consider the appropriate intensity and depth of intervention tailored to each client.

Various government agencies report that intentional self-harm leading to suicide ranks first among the causes of death for adolescents in South Korea, and a significant portion of the population is considered at risk for suicide attempts, suicidal ideation, and related behaviors [2]. Given that self-harm is a persistent social issue, ongoing surveys regarding suicide rates, attempts, and ideation among adolescents are conducted in fields such as education, psychology, and medicine to gather evidence for prevention and crisis management [3].

Some studies suggest that adolescents in developmental adolescence may exhibit impulsive behaviors due to insufficient cognitive and behavioral coping strategies and underdeveloped emotional self-regulation. However, upon closer examination, it is observed that cumulative processes such as ongoing and progressive deterioration of family conflicts, maladjustment in school life, and peer relationships lead to chronic maladaptation, despair, and depression after experiencing failures in coping mechanisms. These cumulative processes contribute to suicidal behavior [4]. Therefore, to address adolescent crises effectively, it is crucial to have a valid understanding of these factors, elucidate the process-related influences of relevant factors, and incorporate them into the assessment and management of suicidal crises.

1.2 Literature Review

The perspective on suicide can broadly be categorized into long-term stress models and short-term crisis models. The long-term stress model views suicide behavior as a product of prolonged psychological distress, while the short-term crisis model considers suicidal behavior as a reaction to recent failures, setbacks, or losses. Studies on suicide behavior report that although the act itself may be impulsive, there is often a preparatory phase, leading to many cases demonstrating characteristics of planned suicide [5]. Due to the cumulative nature of suicidal behavior, risk factors are sometimes classified based on temporal proximity into proximal and distal factors [6]. Proximal factors are those triggering events closely preceding the suicidal act, among which relational factors, such as deterioration or breakdown of interpersonal social environments, appear to be particularly significant for adolescents. Additionally, psychological states that involve identifying with others' situations and the influence of group culture among conforming adolescents are reported to play a role. Joiner (2005) integrates interpersonal relationships and psychological variables in proposing a theory that comprehensively explains factors influencing suicidal behavior. Joiner suggests that suicidal behavior occurs when there is a combination of 1) acquired capability for suicide, 2) perceived burdensomeness on others, and 3) a sense of thwarted belongingness within a group, collectively escalating the risk of attempting and completing suicide.

On the other hand, distal factors are indirect influences on suicidal behavior and include factors such as depression, feelings of isolation, impulsivity, loss of relationships, and substance abuse. Suicide is a multifaceted phenomenon resulting from the accumulation of various factors, with deep interconnections among them [7]. The Centers for Disease Control and Prevention (CDC) in the United States categorize suicide risk factors into seven categories, which generally include family history and life experiences [8]. In domestic research, it has been reported that the risk of suicide dramatically increases when major risk factors such as depression, loss of intimate relationships, and social isolation are present [9]. Post-mortem studies of suicide victims indicate that approximately 60% of them had experienced various mood disorders, including major depressive disorder. Follow-up observations of individuals with major depressive disorder show that the risk of suicide attempts is highest during depressive episodes, and the frequency of suicide attempts increases with the severity of depression [10].

The aforementioned studies indicate that psychological and emotional distress experienced by individuals underlies the staged progression of suicidal crises. If this is the case, it implies a practical need for efforts to alleviate such distress. However, existing research often lacks exploration into the antecedents influencing this distress. Even factors mentioned as distal contributors, such as emotional states, initial loss of relationships, and subsequent substance issues, fail to address individual differences in impulsivity, isolation, and depression leading to suicidal behavior. It is well-established in various studies that emotional maladjustment can lead to cognitive biases and behavioral influences [11]. Recent research emphasizes that emotions dynamically change in response to individuals' experiences and environments, highlighting the potential for a third emotional state, alongside negative mood states like depression and anxiety and excessively positive mood states like mania, which could lead to psychological pathology [12]. Moreover, depression and anxiety, as mentioned here, are the most significant crisis factors leading to suicidal crises [9].

According to the psychopathological model, failure in emotion regulation is considered a fundamental issue in psychiatric disorders, including personality disorders [13]. Emotion regulation problems are reported to be associated with approximately 40% to 75% of all mental disorders [14]. Almost all diagnostic categories in the DSM-5 include at least one symptom related to emotion regulation issues, such as emotional excess (e.g., persistent feelings of fear in anxiety disorders), emotional deficiency (e.g., lack of empathy in narcissistic personality disorder), social-emotional issues (e.g., lack of emotional interaction in autism spectrum disorder), and emotion regulation problems (e.g., difficulties in anger control in borderline personality disorder) [15, 16]. Additionally, emotion regulation disorders in children and adolescents are associated with internalizing issues such as depression and anxiety and externalizing problems such as anger [17, 18]. In this regard, emotion regulation is a key mechanism explaining psychological and social issues as well as psychopathology. In this context, when considering psychological support for addressing adolescent suicide issues, coping with emotions can also be seen as crucial. Thus, it is essential to deeply understand adolescents' subjective inner worlds and assess their psychological adaptability by identifying patterns of emotional changes over time and factors influencing them, alongside their average emotional levels [19].

Emotion, in itself, is a highly comprehensive variable. In this study, we aim to consider the differences and changes in emotional experiences that influence adolescent suicidal behavior. Typically, in research,

another expression of emotional change, 'emotional instability,' is considered a significant individual difference variable in personality studies [20]. Among the internal attributes that daily influence this emotional instability, interpersonal sensitivity plays a crucial role. Interpersonal sensitivity is an inborn temperament but can be a modifiable factor and is necessary to consider for a fundamental understanding of adolescent suicide. Interpersonal sensitivity is reported to influence perception of emotional changes and stress perception. Individuals with high interpersonal sensitivity are reported to perceive higher levels of stress in similar relational situations [12]. Moreover, higher perceived stress correlates with more frequent transitions from normal mood to feelings of depression, elation, anger, or anxiety, or shifts between various emotions. Interpersonal sensitivity is highly related to emotional changes, specifically affecting affective variability and emotional inertia. Affective variability refers to the degree of emotional fluctuation, while emotional inertia indicates the degree to which emotions remain stable regardless of time. Individuals with low affective variability experience similar intensity emotions consistently, regardless of whether the intensity is high or low. Excessive emotional inertia leads to rigid emotional responses, where emotions remain unchanged despite external circumstances or environmental changes [9], [21]. From this perspective, interpersonal sensitivity can be seen as a daily life variable that significantly influences the emotional aspects closely related to adolescent suicidal behavior. Interpersonal sensitivity refers to a tendency to overly sensitive or hypersensitive responses to physical, mental, social, or emotional stimuli. These responses can vary depending on interactions with others, environmental factors, and social situations in daily life. Interpersonal sensitivity is typically studied from the perspectives of neuroscience and psychology, and it is known to be influenced by personality traits, brain physiology, genetic factors, and environmental influences [4]. Due to its association with temperament, interpersonal sensitivity is often perceived as an innate trait and may not be actively considered in counseling interventions. However, previous research suggests that interpersonal sensitivity can develop not only from innate aspects but also from certain experiences or external factors. Interpersonal sensitivity is associated with intense emotional reactions, physical discomfort, social anxiety, and difficulties in social interaction. Individuals with high interpersonal sensitivity may experience more stress in interpersonal relationships and are relatively more likely to experience social anxiety or depression [12].

From an integrated perspective, suicide-related deaths are considered to occur when the interaction of psychiatric, biological, psychological, and sociological factors leads to a dangerous suicidal state. When a particular trigger surpasses a critical threshold, the suicide process ends in death [22]. Therefore, while someone may have 1) vulnerability to suicide due to past history such as depression or punitive parenting environments, and 2) risk factors like emotional disorders or mental pathologies, not all individuals with these elements will engage in suicidal behavior. Former reasearch emphasized the emotional and cognitive activation that leads to actual suicidal behavior [23]. He proposed that individuals affected by biological, sociological, and psychological influences enter a suicidal state when significant psychological distress initiates the process. In the decision-making process of suicide, a competition between reasons for life and reasons for death occurs, and the outcome of this internal competition determines whether an individual will attempt suicide.

In summary, when distal (long-term) and proximal (short-term) influences accumulate, and a person enters a dangerous suicidal state, it is the combination of internal factors (emotional and cognitive activation) and external triggers exceeding a threshold that leads to suicide. This explanation implies that the suicide process is gradual, and factors such as personal history, mental disorders, suicide attempt history, stress, and loss of relationships can act as risk factors for suicide.

In terms of pathways, some view adolescent suicide crises as involving three stages of behavior: suicidal thoughts, suicide attempts, and death [23]. Others divide the pathway into four dimensions: suicidal ideation, suicidal planning, suicidal attempts, and suicidal completion. When the spectrum of suicidality is divided into more detailed steps, it may include: (1) thoughts about death, (2) wishes to be dead, (3) suicidal thoughts, (4) suicidal plans, (5) suicidal intentions, (6) suicide attempts, and (7) suicide itself. However, prior research has pointed out that passive suicidal ideation, such as vague thoughts about death or wishes to be dead, tends to have a low positive predictive value [8]. As for the sequence between thoughts, plans, and attempts, it is generally reported that suicidal thoughts precede plans and attempts. Previous studies indicate that some individuals who have suicidal thoughts go on to make suicide attempts, whereas the group that reported no suicidal thoughts had a significantly lower incidence of suicide attempts. Thus, while suicidal thoughts do not necessarily lead to attempts or death, they are a significant predictor of suicide attempts [24].

Interventions for adolescent suicide crises have long been shown to be most effective when integrating multiple factors [25]. Therefore, understanding the relationships among the complex crisis factors that influence

suicide and clarifying whether there is a sequential pathway from suicidal thoughts to attempts will contribute to a comprehensive understanding of adolescent suicide and help identify various intervention methods.

In summary, adolescent suicide crises involve the complex interplay of various factors, necessitating consideration of their interrelatedness and dynamic aspects. Many risk factors associated with suicidal crises can be viewed as process variables along the crisis pathway. At the core of these factors lies interpersonal sensitivity, influencing emotional changes that precipitate suicidal crises. Therefore, the hypothesis is to confirm the impact of interpersonal sensitivity differences on the pathway of adolescent suicide crises.

2. Materials and Methods

2.1 Research Participants

The data utilized in this study were derived from existing survey materials conducted at the A Youth Counseling and Welfare Center, an organization under the Ministry of Gender Equality and Family in South Korea, specifically in the Seoul metropolitan area. This study utilized data from an institutional research project [23]. The data were obtained with permission from both the researcher and the institution. The analysis included additional examination of the raw data that had been collected during the original study but were not previously analyzed or included in the original report. The survey was conducted in six schools located in Gyeonggi Province. A total of 496 middle and high school students responded to the survey. Among them, there were 244 (50%) male respondents, 245 (50%) female respondents, and 7 non-responses. Consequently, data from 489 participants were analyzed in the study. Descriptive statistics of the participating adolescents are summarized in Table 1. The survey was conducted with the cooperation of the survey institution. Initially, cooperation letters were sent to the target schools, and the survey was conducted with items including consent from both adolescents and parents.

Table 1. Demographic Characteristics Frequency/Percentage

Category		Grade						Total
		G7	G8	G9	G10	G11	G12	
Sex	Male	54	43	42	39	34	32	244
		22.1%	17.6%	17.2%	16.0%	13.9%	13.1%	100.0%
	Female	39	43	36	41	47	39	245
		16.0%	17.6%	14.8%	16.8%	19.3%	16.0%	100.0%
Total		93	86	78	80	81	70	489
		19.1%	17.6%	16.0%	16.4%	16.6%	14.3%	100.0%
No Response								7
								1.6%

2.2 Questionnaire

The questionnaire used in the survey consisted of a total of 97 items, comprising demographic questions (10 items), questions related to suicidal thoughts, desires, plans, and attempts (13 items), and experience-related items for 10 risk factors, totaling 84 items. The items were constructed using questions from the Minnesota Multiphasic Personality Inventory (MMPI) and the Symptom Checklist-90-Revised (SCL-90-R). Questions related to alcohol/drug addiction and family support were derived from the MMPI, while those related to anxiety, psychosis, depression, impulsivity/hostility, and interpersonal sensitivity were derived from the Symptom Checklist-90-Revised (SCL-90-R). The MMPI and SCL-90-R are standardized tests therefore, this study did not report internal consistency reliability. Table 2 provides examples of items used for each variable in the study.

Table 2. Survey Instrument Composition and Item Examples

	Category	Items Number	Items Examples
Suicidal Crisis Step	Assessment of Suicidal Thoughts and Desires	7	It seems like there is no hope for my future.
	Suicide Planning	4	I have thought about suicide, but I haven't considered any specific methods.
	Experience of Suicide Attempt	2	I have attempted suicide before.
Risk Factors for Suicide	Severe Anxiety	10	My body or mind is trembling.
	Psychosis	10	It feels like other people know my private thoughts.
	Depression	13	I feel drained and down..
	Lack of Family Support	33	My family doesn't like the job I chose.
	Recent Stress	3	I broke up with my boyfriend/girlfriend within the last three months.
	Interpersonal Sensitivity	9	I feel displeased with others.

2.3 Analysis Procedure

The study utilized an existing model to analyze the factors contributing to suicidal ideation, plans, and attempts among adolescents. Five significant factors identified through regression analysis were included in the model for reanalysis. During this process, the validity of the model, including the direct pathway from risk factors to suicide plans, was compared and verified. The AMOS 22 program was employed to assess the fit of the model. Since there were no missing data, maximum likelihood estimation was used for model estimation. For the risk factors, sub-factors were specified, while items related to suicidal ideation and plans were analyzed using factor analysis based on factor loadings. Model fit was assessed using indices such as CFI, NFI, TLI, and RMSEA. A model was considered fit if CFI, NFI, TLI were above .9, and RMSEA was below .1 [24]. Group Differences Analysis Based on Interpersonal Sensitivity: To analyze differences in the model between groups based on levels of interpersonal sensitivity, the mean value of interpersonal sensitivity (m=1.8989) was used as the criterion for dividing the sample into two groups: the high group and the low group. Out of 496 responses, 9 were excluded due to missing responses on items related to interpersonal sensitivity. The high group comprised 192 responses, while the low group comprised 295 responses. To assess group differences in the model, measurement invariance was examined first by applying measurement invariance constraints to factor loadings. Subsequently, the significance of differences in path coefficients between groups was examined by comparing the change in $\chi 2$ values between models with and without equality constraints on the path coefficients. If the change in $\chi 2$ values was statistically significant, it indicated a significant difference between groups in the corresponding path coefficient, suggesting group differences in the model.

The correlation between risk factors and stages of suicidal crisis remained consistent with previous research. Initially, it was found that there were static correlations between risk factors and stages of suicidal crisis. Among the risk factors, significant static correlations ranging from .38 to .78 ($p < .001$) were observed. Notably, anxiety exhibited a high correlation of over .70 with both depression and psychosis. Within the stages of suicidal crisis, significant static correlations were observed between suicidal ideation and planning ranging from .48 to .57 ($p < .001$), between suicidal ideation and attempts ranging from .49 to .55 ($p < .001$), and between planning and attempts ranging from .44 to .54 ($p < .001$). It appeared that correlations became stronger sequentially from suicidal ideation to planning and then to attempts. Overall, the correlations between risk factors and each stage of suicidal crisis were highest with suicidal ideation, followed by planning and attempts. The summarized findings are presented in Table 3 below.

3. Results

3.1 Descriptive Statistics and Correlation Coefficients of Key Variables

The correlation between risk factors and stages of suicidal crisis remained consistent with previous research. Initially, it was found that there were static correlations between risk factors and stages of suicidal crisis. Among the risk factors, significant static correlations ranging from .38 to .78 ($p < .001$) were observed. Notably, anxiety exhibited a high correlation of over .70 with both depression and psychosis. Within the stages of suicidal crisis, significant static correlations were observed between suicidal ideation and planning ranging from .48 to .57 ($p < .001$), between suicidal ideation and attempts ranging from .49 to .55 ($p < .001$), and between planning and attempts ranging from .44 to .54 ($p < .001$). It appeared that correlations became stronger sequentially from suicidal ideation to planning and then to attempts. Overall, the correlations between risk factors and each stage of suicidal crisis were highest with suicidal ideation, followed by planning and attempts. The summarized findings are presented in Table 3 below.

Table 3. Mean, SD, and Correlation Coefficients of Key Variables

Category	Risk Factors					Suicidal Thoughts and Desires			Suicide Planning		Suicide Attempt	
	1	2	3	4	5	6	7	8	9	10	11	12
2	.75***											
3	.77***	.79***										
4	.59***	.61***	.60***									
5	.39***	.42***	.40***	.47***								
6	.61***	.51***	.65***	.56***	.33***							
7	.62***	.51***	.68***	.53***	.36***	.74***						
8	.64***	.60***	.69***	.58***	.34***	.75***	.66***					
9	.396***	.38***	.47***	.44***	.18***	.57***	.49***	.48***				
10	.51***	.53***	.51***	.50***	.35***	.56***	.51***	.51***	.30***			
11	.47***	.49***	.50***	.48***	.36***	.55***	.50***	.50***	.44***	.54***		
12	.46***	.51***	.50***	.50***	.35***	.54***	.51***	.50***	.45***	.54***	.90***	
Mean	1.76	1.46	1.84	1.88	1.50	1.95	1.99	1.92	2.34	1.72	1.38	1.41
SD	.85	.71	.91	.59	.73	1.03	.97	.85	1.01	.71	.85	.89

*** p<.001. 1. Severe Anxiety 2. Psychosis, 3. Depression, 4. Lack of Family Support, 5. Stress, 6. Suicidal Thoughts and Desires1, 7. Suicidal Thoughts and Desires 2, 8. Suicidal Thoughts and Desires 3, 9. Suicide Planning 1, 10. Suicide Planning 2, 11. Experience of Suicide Attempt 1, 12. Experience of Suicide Attempt 2

3.2 The measurement model and structural model validation

The measurement model's fit indices were as follows: $\chi2(48) = 218.727$, CFI(Comparative Fit Index) = .960, NFI(Normed Fit Index) = .949, TLI(Tucker-Lewis Index) = .934, RMSEA(Root Mean Square Error of Approximation) = .085, indicating a good fit to the data. Similarly, the structural model showed adequate fit indices: $\chi2(51) = 264.352$, CFI = .949, NFI = .938, TLI = .923, RMSEA = .093. These indices assess the model fit by taking into account the data, the baseline model, and the complexity of the proposed model. In general, values of .95 or higher are considered to indicate an excellent fit, while values of .90 or higher are viewed as acceptable. Thus, the models in this study can be regarded as having an acceptable fit. As previous research indicated that the path from risk factors to suicide planning was not significant, a modified model was directly specified for analysis in this study. The analysis revealed that all path coefficients were statistically significant and positive: the path from risk factors to suicidal ideation and urges ($\beta = .853$, $p < .001$), from suicidal ideation and urges to suicide planning ($\beta = .937$, $p < .001$), and from suicide planning to suicide attempt ($\beta = .736$, $p < .001$), demonstrating static relationships. The fit indices of the model are presented in Table 4.

Table 4. Research Model Fit

Model	χ^2(df)	CFI	NFI	TLI	RMSEA	RMSEA (90% CI)
Research Model	264.352(51)	.949	.938	.923	.087	.076～.098

In the final model of the suicide crisis pathway, the path coefficients for each path were as follows: the path from risk factors to suicidal ideation and urges (β = .854, $p < .001$), from suicidal ideation and urges to suicide planning (β = .935, $p < .001$), and from suicide planning to suicide attempt (β = .742, $p < .001$), all of which were statistically significant and statically represented. Subsequently, the mediating effects between risk factors and stages of suicide crisis were verified following the bootstrap procedure. The effectiveness of each variable's relationship was examined in terms of direct effects, indirect effects, and total effects. It was found that risk factors had a significant indirect impact on suicide planning through suicidal ideation and urges, while the direct effect of risk factors on suicide planning and attempt was not significant. Conversely, the total and indirect effects of suicidal ideation and urges on suicide attempt were .762 ($p < .001$), indicating complete mediation by suicide planning in the relationship between suicidal ideation and urges and suicide attempt. The individual path coefficients of the final model are presented in Table 5, and the effect analysis for the structural model is provided in Table 6.

Table 5. Individual Path Coefficients of the Research Model

Pathway	Unstandardized Path Coefficients	SD Error	Standardized Path Coefficients	C.R.
Risk factors→ Suicidal Thoughts and Desires	.825***	.044	.854	18.949
Suicidal Thoughts and Desires →Suicide Planning	.639***	.042	.935	15.254
Suicide Planning→ Suicide Attempt	1.280***	.096	.742	13.366

Table 6. Direct Effects, Indirect Effects, and Total Effects of the Research Model

Pathway	Total Effects	Direct Effects	Indirect Effects
		(90% CI)	
Risk factors → Suicidal Thoughts and Desires	.854* (.814～.893)	.854* (.814～.893)	.000 .000～.000
Risk factors → Suicide Attempt	.592* (.518～.668)	.000 (.000～.000)	.592* (.518～.668)
Suicidal Thoughts and Desires →Suicide Planning	.935* (.874～.990)	.935* (.874～.990)	.000 (.000～.000)
Suicidal Thoughts and Desires → Suicide Attempt	.694* (.616～.759)	.000 (.000～.000)	.694* (.616～.759)
Suicide Planning→ Suicide Attempt	.742* (.652～.815)	.742* (.652～.815)	.000 (.000～.000)

3.3 Differences in the model based on interpersonal sensitivity

The groups were divided into upper and lower groups based on their level of interpersonal sensitivity, and a comparative analysis of the models between these groups was conducted. To do this, measurement invariance testing was initially performed, which resulted in an acceptable fit for the model with factor loading equality constraints across groups, indicated by χ2(df) = 392.700(110), CFI = .902, NFI = .870, IFI = .903, TLI = .882, and RMSEA = .073, confirming cross-group validity. Table 7 presents the estimated path coefficients for each group obtained from the model with factor loading equality constraints applied.

Table 7. Parameter Estimates by Group According to Levels of Interpersonal Sensitivity (Model with Equality Constraints on Factor Loadings)

Parameter	Interpersonal Sensitivity Upper Group(n=191)	Interpersonal Sensitivity Lower Group(n=295)
Risk factors → Suicidal Thoughts and Desires	.850***	.747***
Suicidal Thoughts and Desires →Suicide Planning	.864***	.986***
Suicide Planning→ Suicide Attempt	.803***	.565***
*p<.05, **p<.01, ***p<.001		

Next, to determine if there were differences in each path coefficient between the groups, we examined the changes in degrees of freedom and fit indices (χ2, TLI) between the model with equality constraints on each path coefficient and the baseline model without such constraints. $\Delta\chi^2$ (Delta Chi-square) represents the difference in chi-square statistics between two models. It indicates the change in model fit when comparing nested models. Δdf (Delta degrees of freedom): This refers to the difference in degrees of freedom between two models, reflecting the change in model complexity during the comparison. As a result, it was found that the model with equality constraints on the paths from risk factors to suicidal thoughts and desires, and from suicide planning to suicide attempts, differed significantly from the baseline model. For the path from risk factors to suicidal thoughts and desires, the standardized path coefficient was .850 in the upper group and .747 in the lower group, suggesting that risk factors had a greater influence on suicidal thoughts and desires in the upper group. Regarding the path from suicide planning to suicide attempts, the standardized path coefficient was .803 in the upper group and .565 in the lower group, indicating that suicide planning had a greater impact on suicide attempts in the upper group. Table 8 provides the changes in χ2 and TLI values between the baseline model and models with equality constraints on path coefficients for the upper and lower groups.

Table 8. Comparison of Differences Between Upper and Lower Groups Across the Baseline Model and Models with Equality Constraints on Path Coefficients

Path with Equality Constraints	Δdf	Δχ2	ΔTLI
Risk factors → Suicidal Thoughts and Desires	1	18.944***	.006
→ Suicidal Thoughts and Desires →Suicide Planning	1	.000	.002
Suicide Planning → Suicide Attempt	1	9.882***	.002
Equality Constraints on All Paths	3	31.956***	.008

Below Figure 1 presents the overall path model with paths between factors overlaid with results from multiple comparisons across interpersonal sensitivity levels. Path values for upper sensitivity group are provided within parentheses. It shows changes in model fit when path coefficients were constrained to be equal across groups with high and low interpersonal sensitivity. The path from Risk Factors to Suicidal Thoughts and Desires was significant ($\Delta\chi^2 = 18.944$, $p < .001$), indicating that this path differs significantly between the two groups. The path from Suicidal Thoughts and Desires to Suicide Planning was not significant ($\Delta\chi^2 = .000$), suggesting that this path does not differ between the groups. The path from Suicide Planning to Suicide Attempt was ignificant ($\Delta\chi^2 = 9.882$, $p < .001$), indicating a significant group difference. When all paths were constrained to be equal, the overall model fit significantly worsened ($\Delta\chi^2 = 31.956$, $p < .001$), implying that the path structure differs across groups. The relatively low ΔTLI values (.006–.008) suggest that although significant differences were found, the overall model fit remained acceptable. These results highlight that interpersonal sensitivity moderates certain key pathways in the suicidal crisis model, specifically the connections from risk factors to suicidal thoughts and desires, and from suicide planning to suicide attempts, suggesting a differential impact across the high and low sensitivity groups.

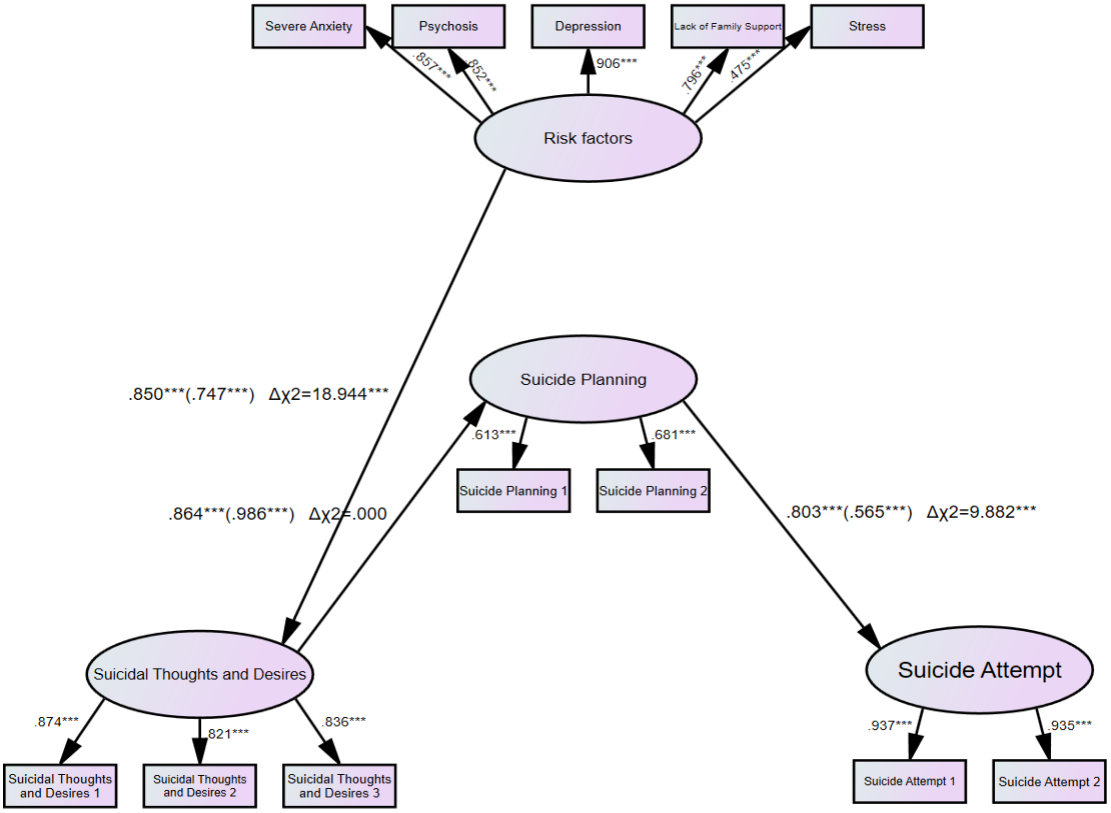

Figure 1. Multiple Group Comparison Model of Suicide Crisis Pathways According to Interpersonal Sensitivity

4. Conclusion and Discussion

4.1 Conclusion

This study was conducted to analyze the differences in the impact of risk factors and the pathway to suicide crisis among adolescents based on their interpersonal sensitivity. The results of this study can be summarized as follows.

This study empirically investigated how suicidal crisis pathways differ according to levels of interpersonal sensitivity among adolescents. The findings confirmed a linearprogression from risk factors to suicidal ideation and desire, which then lead to planning and eventually to suicidal attempts. Particularly in the high sensitivity group, the transition from planning to attempt was more pronounced, suggesting that interpersonal sensitivity may act as an accelerating factor in the progression of suicidal crises. Consistent with previous research, it was found that risk factors directly influence suicidal thoughts and desires, while they indirectly affect planning and attempts. In the analysis of intergroup path differences based on interpersonal sensitivity, it was observed that the coefficients for the paths where risk factors influence suicidal thoughts and desires, as well as the paths from planning to attempted suicide, were significantly larger in the group with higher interpersonal sensitivity. First, early emotional and relationship-focused interventions are crucial at the stage when suicidal thoughts are first detected. For adolescents with high interpersonal sensitivity, even subtle relational conflicts or emotional fluctuations may lead to a crisis. Therefore, teachers, counselors, and caregivers should act as sensitive gatekeepers who can detect and respond to emotional cues. Second, tailored education programs for emotion regulation and social skills development are needed for adolescents with high interpersonal sensitivity. Examples include emotional journaling, expressive training, stress management workshops, and role-play-based communication training. These programs can be implemented in school-based settings or in collaboration with youth counseling centers. Third, from a policy perspective, interpersonal sensitivity could be considered a criterion for screening high-risk youth. Periodic psychological evaluations could include items.

4.2 Discussion

The discussion regarding these findings is as follows.

Firstly, when considering the linear progression process where risk factors such as anxiety, depression, psychosis, lack of family support, and stress indirectly influence suicide planning through suicidal thoughts and desires, it highlights the crucial role of gatekeeping at the point where suicidal thoughts emerge. The major risk factors leading to the pathway of suicide crisis, in descending order of impact, were depression, anxiety, family support, psychosis, and stress. Previous research has also reported the effect sizes (d) of depression, anxiety, psychosis, and family support on suicidal thoughts to range from approximately 1.2 to 1.8, indicating a significant association between crisis factors and suicidal thoughts, with depression, anxiety, and family support exerting relatively greater influence. According to the results of the mediation analyses, the effects of risk factors were strongest on suicidal thoughts and desire, followed by suicide planning, and then suicide attempts, with a similar pattern observed for total effects. Suicidal thoughts (ideation) and desire were found to influence suicide planning, and the pathway to suicide attempts emerged exclusively through suicide planning. These findings underscore the critical role of gatekeeping in blocking the progression to the next phase within the suicide crisis pathway. It was proposed in earlier research that suicide unfolds as a gradual decision-making process [26]. As stated above, while an individual may enter a suicidal state due to significant psychological pain, the actual decision to end one's life is shaped by a cumulative process in which various reasons for living and dying vie with one another [22]. Hence, crisis factors are viewed as exerting interactive rather than isolated effects, with the accumulated impact of multiple crisis factors yielding greater functional impairment than any single risk factor acting alone [27]. From a developmental and crisis-stage perspective in adolescent suicide, suicidal behavior is regarded as an outcome that emerges from antecedents and problem behaviors within the progression of crisis. This suggests the potential role of emotional and relational factors in entering or preventing suicidal crises. Underlying the progression of suicidal crises is ultimately the dynamic interplay of personal and environmental factors, including significant interpersonal relationships, deficits in self-regulation and stress resilience, which hinder the individual's use of existing behavioral skills and the development of new capabilities. Crisis factors are reported to have cumulative effects that result in greater functional impairment compared to individual factors alone. In other words, it is emphasized that it is not just the presence of risk factors, but rather the activation of emotional and cognitive aspects by these specific triggering factors that surpass the threshold, leading to suicidal behavior [8], [28, 29]. Therefore, when examining suicidal crisis pathways and progression, there is a need to consider underlying variables that influence cognitive-emotional activation.

Secondly, the suicidal crisis pathway showed partially significant differences depending on interpersonal sensitivity. As mentioned earlier, the coefficients of the pathways from risk factors to suicidal thoughts and from suicide planning to suicide attempts were significantly larger in the group with higher interpersonal sensitivity. Considering the accumulative and linear progression nature of suicidal crises, the influence of interpersonal sensitivity becomes a variable affecting the progression or attenuation of the linearity of suicidal crises. As mentioned earlier, interpersonal sensitivity is considered a primary individual difference variable in personality research dealing with emotional instability. In other words, interpersonal sensitivity may influence the activation of factors affecting the progression of suicidal crises from a cognitive-emotional perspective [20]. Baumeister (1990) considered suicide as a progressive decision-making process, while Beck et al. (1993) emphasized that the content of suicidal thoughts links severity of depression to suicidality. For example, individuals who are depressed or suicidal may harbor traps of memories of past failures or setbacks in life, which can diminish problem-solving abilities and limit future outlook. Interpersonal sensitivity is associated with sensory sensitivity, which can increase an individual's emotional volatility and elicit stronger reactions to stimuli [12]. Thus, understanding sensitivity can aid in understanding and predicting individual personality and behavioral characteristics. Interpersonal sensitivity is related to components of sensory processing sensitivity such as hyperreactivity and attention to sensory stimuli, and individuals with high levels of these traits tend to exhibit increased internalizing symptoms, particularly prominent features such as depression, anxiety, and self-blame [30]. The findings of this study empirically confirm that interpersonal sensitivity may influence the coefficients and effect sizes of the suicidal crisis pathway, within this framework.

Interpersonal sensitivity encompasses both innate temperamental aspects and developmental factors influenced by experiences. Considering the significant differences in suicidal crisis pathways according to interpersonal sensitivity, there are several educational implications to consider. Acknowledging the subjective emotions and internal experiences of adolescents with interpersonal sensitivity is crucial. Through this process,

adolescents can establish more realistic boundaries and feel safe to seek help when experiencing difficulties. It's essential in counseling for adolescents to learn how to express their emotions and communicate them effectively. Given the impact of interpersonal sensitivity, emotional interaction and regulation experiences are prerequisites. Additionally, predicting situations where adolescents may be influenced by interpersonal sensitivity and taking preemptive measures are important. For example, if adolescents need to participate in social events, considerations such as sharing schedules in advance or providing support by accompanying them with someone who can offer a sense of stability could be helpful.

This study deals with the relevance of variables based on questionnaires, thus it operates at a level distinct from directly measuring the actions of the body and sensory organs. Interpersonal sensitivity addresses sensitivity in the relational domain and holds value as a psychosocial variable. However, related studies consulted in this research have differentiated more nuanced variables through task processing and measurement of individual research subjects, associating such data with issues such as emotional expression problems, autism, depression, and anxiety [31]. Although such studies may be challenging to find domestically, as the understanding of variables influencing adolescent self-harm crisis pathways becomes more detailed, proposing future research to further refine and objectively measure interpersonal sensitivity variables can lead to more realistic and tangible intervention strategies.

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