Presenting a Causal Model of Suicidal Behavior Based on Early Childhood Trauma the Mediation of Thwarted Belongingness in Suicide Attempters in Tehran

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ABSTRACT

Objective: According to reports, a suicide attempt is made every 40 seconds in the world, some of which have serious consequences for the attempter. The present study investigated the relationship between suicidal behavior in suicide attempters and early childhood trauma, with the mediation of thwarted belongingness.

Materials and Methods: The current study is descriptive and correlational. A total of 365 patients who attempted suicide and were hospitalized at Baharloo Hospital in Tehran in 2022 were selected through convenience sampling. The Childhood Trauma Questionnaire (CTQ), Interpersonal Needs Questionnaire (INQ) for thwarted belongingness, and the Suicidal Behaviors Questionnaire-Revised (SBQ-R) were administered to the suicide attempters. The Sobel test was used to examine the mediation hypotheses, and structural equation modeling (SEM) was employed to evaluate the proposed model.

Findings: The results showed that there are positive and significant relationships between Childhood trauma score and suicidal behavior (r=0.42, p<0.001), and thwarted belongingness and suicidal behavior (r=0.395, p<0.001). The model fit indices confirmed the path from Childhood trauma to suicidal behavior and the path from Childhood trauma with the mediation of thwarted belongingness.

Conclusion: The results of this study showed that Childhood trauma plays a crucial role in suicidal behavior, both directly and indirectly through the mediation of thwarted belongingness. Therefore, teaching families and schools to prevent childhood traumas, as well as providing treatment for individuals with childhood traumas and addressing their interpersonal needs (thwarted belongingness), can effectively prevent and reduce suicidal behavior.

Keywords: Childhood trauma, Thwarted belongingness, Suicidal behavior

1. Introduction

Suicide is a complex, multidimensional, multifactorial phenomenon, fundamentally psychological, associated with unbearable psychological pain and suffering, leading individuals to decide to end their own lives (Ayar & Sabanciogullari, 2021). A suicide attempt is a non-lethal, self-initiated act with a potential for harm where the individual intends death. Generally, suicide is a complex behavior arising from the interaction of several different factors, and the exact cause of suicidal behavior remains unknown. Also, suicidal thoughts and suicide attempts are much more common than lethal suicide attempts (Waraan et al., 2023). According to the World Health Organization, about 20% of suicides worldwide are by poisoning, most of which occur in agricultural rural communities in low and middle-income countries (Hamidi et al., 2022; Kyron et al., 2022).

One of the influencing factors in suicidal behavior is childhood traumas, considered a significant warning factor for suicidal behavior (Sijercic et al., 2022). Furthermore, childhood maltreatment and low social support increase self-harm and suicidal behavior in adolescents. Research indicates that patients with a history of childhood trauma have a 3.01 times higher lifetime prevalence of suicide attempts compared to patients without such a history (Narimani, Rahimi, & Sedaghat, 2021). Studies showed that a history of physical abuse in childhood is associated with twice the risk of suicide attempts. Also, childhood traumas cause a reduction in hippocampal volume (Staton-Tindall et al., 2013). Thus, traumatized children have weaker long-term outcomes in the future compared to untraumatized children (Danese, 2020). Physical abuse includes intentional injuries and deliberate blows such as bruises, burns, fractures, abdominal wounds, and poisoning to a child under eighteen years by an older individual (Smith et al., 2018). Emotional abuse involves verbal humiliation and aggression towards a child, making the child feel worthless and despised. Sexual abuse is sexual behavior between a child and an adult or between two children, one of whom is older. In physical neglect, the child's basic needs such as food, housing, clothing, education, and medical care are not met, and in emotional neglect, the child's emotional needs are not met (Roy, 2011). Childhood traumas occur when a child faces a real and threatening negative event. Moreover, these events can cause emotional pain in children and affect their coping abilities. Childhood traumas are extensive, take various forms, and typically start early in life. Young children are at the highest risk of facing traumas and are very vulnerable to their adverse effects (Bartlett & Steber, 2019).

Various theories have been proposed regarding suicidal behavior. One of these is the interpersonal theory of suicide. This theory was introduced by Thomas E. Joiner in 2005 and then by Van Orden in 2010. This theory states facts about suicidal behavior that increase human knowledge of suicidal behavior. It provides a framework from idea to action (Van Orden et al., 2010).

A key concept in the interpersonal theory of suicide is Thwarted Belongingness. The need to belong is a core human motivation because it drives individuals towards maintaining stable social relationships, fundamental to psychological and social well-being. Thus, a sense of belongingness is associated with psychological benefits, while its absence leads to psychological dysfunction like depression, anxiety, and despair (Baumeister & Leary, 1995). Therefore, social connection is a principal aspect of thwarted belongingness, and the interpersonal theory of suicide emphasizes the importance of social bonds and attachment processes (Brown et al., 2019).

In thwarted belongingness, the individual feels loneliness and separation from others, manifested in two ways: lack of belonging and interaction with others and lack of reciprocal care, feeling unsupported by others. There is a connection between lethal suicidal behavior and social behavior aspects such as feelings of loneliness, social withdrawal, living alone, low social support, weak family connections, separation from a spouse due to death or divorce, and solitary confinement. Conversely, being married, having children, many friends, and family are associated with reduced suicidal behavior (Ahmadboukani et al., 2022). Among those with suicidal thoughts, the ability to commit suicide, such as fearlessness of pain, tolerance to physical pain and distress, awareness and access to lethal means, and a history of self-harm, is consistently present (Klonsky, Qiu, & Saffer, 2017). In the interpersonal theory of suicide, the desire for suicide only turns into suicidal intent if the individual has no fear of pain, injury, and death. Since suicidal behavior is physically painful, for suicidal intent to turn into suicidal behavior, the individual must have the capacity to withstand physical pain. Therefore, based on the interpersonal model of suicide, childhood traumas can increase the risk of suicidal behavior (Goldberg et al., 2019). Therefore, this study aimed to explain suicidal behavior based on early childhood traumas with the mediating role of thwarted belongingness.

2. Methods and Materials

2.1. Study Design and Participants

The present study is descriptive and correlational. The statistical population of this study was all suicide attempters in Tehran in 2021. In this study, sampling was done using Kline's formula. Since this study is derived from a doctoral dissertation which had a total of 146 items in the questionnaire, the sample size can be considered 2.5 to 5 times the number of questionnaire items according to Kline's formula (Kline, 2023). Therefore, by multiplying the number 146 by 2.5, a sample of 365 was determined. Additionally, due to the possibility of attrition and incomplete questionnaires, 396 questionnaires were obtained from suicide attempters, but 31 questionnaires were excluded due to defects.

The samples were selected from Baharloo Hospital using a convenient method. The conditions for entering the present study were acceptance of a suicide attempt and the consent of the suicide attempters to participate in the study, and consciousness was considered, and the conditions for exiting the plan were the patient's psychosis and addiction.

Suicide attempters responded to the Childhood Trauma Questionnaire (CTQ), the Interpersonal Needs Questionnaire (INQ), and the Osman Suicide Behaviors Questionnaire-Revised (SBQ-R). Initially, 396 questionnaires were obtained from suicide attempters, of which 365 questionnaires were entered into statistical analysis.

2.2. Measures

2.2.1. Childhood Trauma

The Childhood Trauma Questionnaire (CTQ) was initially designed by Bernstein et al. in 1994, and its second version with 53 items was published in 1995. In 1998, the final version of the test with 34 questions was released, and in 2003, a short form with 28 items was presented, of which 25 are clinical and three are for validity. The questions are rated on a Likert scale with five levels (never, rarely, sometimes, often, and always). Also, this questionnaire includes five subscales: physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect. The validity of various factors of the questionnaire has been reported between 0.79 to 0.94 using test-retest and Cronbach's alpha methods. The cutoff scores for emotional abuse are 13 and above, physical abuse 10 and above, sexual abuse 8, emotional neglect 10 and above, and physical neglect 10 and above (Bernstein et al., 2003). Its Cronbach's alpha and subscales were reported between 0.813 to 0.977. In the present study, the Cronbach's alpha for the subscales of physical neglect was 0.801, emotional neglect 0.773, emotional abuse 0.705, physical abuse 0.730, and sexual abuse 0.783. Also, the overall Cronbach's alpha for childhood trauma was 0.780 (Ahmadboukani et al., 2022).

2.2.2. Interpersonal Needs

The Interpersonal Needs Questionnaire (INQ-15), used in the present study, asks participants to choose the best option according to their beliefs from its 15-item version. Of the 15 items, nine are related to thwarted belongingness (the extent of an individual's connection with others) and six to perceived burdensomeness. This study used only the items related to thwarted belongingness. Scoring is done on a seven-point Likert scale from 'Not at all true for me' to 'Very true for me.' Questions 8, 10, 13, 14, and 15 are reverse scored. From the questionnaire items, questions 9, 11, and 12 were excluded due to low factor loadings. The reliability of the Interpersonal Needs Questionnaire's Cronbach's alpha for thwarted belongingness and the whole questionnaire was reported as 0.84 and 0.89, respectively. Also, the test-retest reliability coefficients for thwarted belongingness and the whole questionnaire were reported as 0.87 and 0.83, respectively, two weeks later. Content validity was assessed using Spearman's correlation coefficient of 0.9, and construct validity above 0.40 was reported. The Pearson correlation coefficients between the Interpersonal Needs Questionnaire and scores of Beck's Suicide Scale and Beck's Hopelessness Scale were reported as 0.45 and 0.47, respectively, indicating the convergent validity of the Interpersonal Needs Questionnaire. In the present study, Cronbach's alpha for the Interpersonal Needs Questionnaire for the factor thwarted belongingness was 0.849 (Ahmadboukani et al., 2022; Nsamenang et al., 2013).

2.2.3. Suicide Behaviors

The Suicide Behaviors Questionnaire-Revised (SBQ-R) was initially developed by Linehan in 1981 with four indices for research and clinical purposes. Subsequently, the revised Suicide Behaviors Questionnaire by Osman (SBQ-R) was created in 2001. The questions of the Suicide Behaviors Questionnaire address four domains. Suicidal behavior is defined by the presence, intensity, and repetition of four

characteristics. The first index to assess suicidal behavior is the examination of suicidal thoughts or attempts during the lifetime and past. The second index assesses suicidal thoughts in the last 12 months. The third index examines whether the individual informs others of their suicidal intent. The fourth index assesses the likelihood of suicide in the future. The first question of this questionnaire has six options, the second question five options, the third question five options, and the fourth question has seven options, from which individuals must choose the best option according to their conditions. The cut-off point for the overall score of the test is seven for the general population and eight for clinical patients. This questionnaire can differentiate groups with suicidal tendencies from those without. The total score range for the Osman Suicide Behaviors Questionnaire is between three to 18, with higher scores indicating a higher risk of suicide. The reliability of the revised Suicide Behaviors Questionnaire with internal consistency was reported between 0.76 to 0.87, and the convergent validity indicates a positive correlation of the revised Suicide Behaviors Questionnaire with Beck's Hopelessness Scale between 0.39 to 0.76 (Alqueza et al., 2023; Osman et al., 2001).

2.3. Data analysis

In the present study, Pearson correlation coefficient (Pearson) and Structural Equation Modeling (SEM) using SPSS version 26 and AMOS version 26 software were used for data analysis of the obtained questionnaires. In this study, childhood traumas were considered as the predictor variable, suicidal behavior as the criterion variable, and thwarted belongingness as the mediating variable. A significance level of 0.05 was considered.

3. Findings and Results

There were 365 participants in this study, of which 222 were women (60.82%) and 143 were men (39.18%). The lowest age for women and men was respectively 15 and 14 years, and the highest age was 65 and 58 years. Specifically, 70 participants were under 20 years old (19.18%), 123 were 20 to 30 years old (33.69%), 97 were 31 to 40 years old (26.58%), 60 were 41 to 50 years old (16.44%), 13 were 51 to 60 years old (3.57%), and 2 were over 60 years old (0.54%). The employment status of respondents was 179 unemployed (49.05%), 151 employed (41.36%), 34 students (9.32%), and one retired (0.27%). The educational level was 31 students (8.50%), 135 below diploma (36.99%), 121 diploma (33.16%), 27 associate degree (7.40%), 40 bachelor's degree (10.96%), 7 master's degree (1.91%), 2 doctoral degrees (0.54%), and 2 students (0.54%). The marital status of respondents was 182 single (49.86%), 154 married (42.20%), 21 separated (5.75%), 8 widowed (2.19%). Of all respondents, 148 had a history of suicide attempts (40.55%), of which 90 were women (60.81%) and 58 were men (39.19%). All respondents had attempted suicide by poisoning.

Table 1 shows the descriptive statistics of the research variables including mean, standard deviation, minimum and maximum values, skewness, and kurtosis in suicide attempters at Baharloo Hospital in Tehran in 2021. To assess the normality of the data, skewness and kurtosis were examined. All values of skewness and kurtosis were within the range of +2 and -2, indicating the normal distribution of the research variables.

Table 1

Descriptive findings

Variable	Submission	Mean	Standard	Min.	Max.	Skewness	Kurtosis
Childhood trauma	Emotional abuse	21.824	4.806	5	25	-1.720	1.429
	Physical abuse	17.608	6.085	5	21	-0.476	-0.756
	Sexual abuse	9.753	6.440	5	25	1.134	0.014
	Emotional neglect	21.624	5.512	5	25	-1.798	1.289
	Physical neglect	16.931	7.110	5	18	-0.408	-1.198
	Total	87.734	21.527	25	125	-0.652	0.205
Thwarted belongingness	Total	27.986	9.693	6	42	-0.572	-0.404
Suicide behavior	Suicidal thoughts or attempts in the past	3.846	1.171	1	4	-0.040	0.135
	Suicidal thoughts in the last year	3.682	1.534	1	5	0.405	-0.484
	Discussing suicide	1.838	1.058	1	3	-1.720	1.429
	Possibility of suicide	3.057	2.183	0	6	-0.476	-0.756
	Total	12.424	4.898	3	18	1.134	0.014

Initially, before analyzing the data, the assumption of missing data and the ratio of missing data to the total data in each variable were examined. It was determined that the missing data for each variable was less than 5%. Therefore, in this study, the Expectation-Maximization (EM) imputation method was used to address missing values. The Variance Inflation Factor (VIF) indicates the role of a predictor variable relative to other variables in the model. Generally, a Tolerance value of less than 0.10 or a VIF greater than 10 indicates the presence of multicollinearity. In this analysis, no deviation from the multicollinearity assumption was observed in any of the calculated Tolerance and VIF values for the research variables (Table 2).

Table 2

Multicollinearity tests

Variable		Index	
Dependent variable	Independent variable	VIF	Tolerance
Suicide behavior	Childhood trauma	1.426	0.701
	Thwarted belongingness	1.311	0.763

Since the calculated VIF value (Variance Inflation Factor) ranges between 1 and 5, it indicates an acceptable level of multicollinearity. Therefore, the assumption of multicollinearity exists for the predictor variable in predicting criterion variables.

Table 3 indicates significant relationship between all variables.

Table 3

Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	**0.592	1									
3	**0.300	**0.388	1								
4	**0.549	**0.500	**0.243	1							
5	**0.411	**0.475	**0.264	**0.522	1						
6	**0.744	**0.800	**0.624	**0.748	**0.749	1					
7	**0.250	**0.256	*0.124	**0.186	**0.219	**0.280	1				
8	**0.422	**0.464	**0.230	**0.316	**0.366	**0.486	**0.694	1			
9	**0.246	**0.230	**0.219	**0.145	**0.195	**0.283	**0.370	**0.511	1		
10	**0.236	**0.289	**0.219	**0.181	**0.222	**0.314	**0.478	**0.637	**0.561	1	
11	**0.350	**0.385	**0.246	**0.255	**0.308	**0.420	**0.750	**0.874	**0.715	**0.881	1

1: Emotional abuse; 2: Physical abuse; 3: Sexual abuse; 4: Emotional neglect; 5: Physical neglect; 6: Suicidal thoughts or attempts in the past; 7: Suicidal thoughts in the last year; 8: Discussing suicide; 9: Possibility of suicide
**p<0.01

Table 4 shows the fit indices of the hypothesized model after model modifications, including Chi-square (χ^2), Chi-square to degree of freedom ratio (χ^2/df), Comparative Fit Index (CFI), Goodness of Fit (GFI), and Root Mean Squared Error of Approximation (RMSEA). A value greater than 0.90 for CFI and GFI indices and a value less than 0.08 for RMSEA indicate a favorable fit of the hypothesized model with the data.

Table 4

Fit indices

Index	χ^2	df	χ^2/df	GFI	CFI	RMSEA
Model	80.298	32	2.509	0.941	0.963	0.064

Figure 1 shows the direct effects between the research variables in individuals attempting suicide at Baharloo Hospital in Tehran in 2021. According to the results, the direct effect of childhood traumas on thwarted belongingness (β=0.48, P<0.001) is statistically significant.

Also, the direct effect of childhood traumas on suicide behavior (β=0.45, P<0.001) is significant. Thwarted belongingness also has a direct and significant effect on suicide behavior (β=0.23, P<0.001).

Figure 1

Model with direct effects
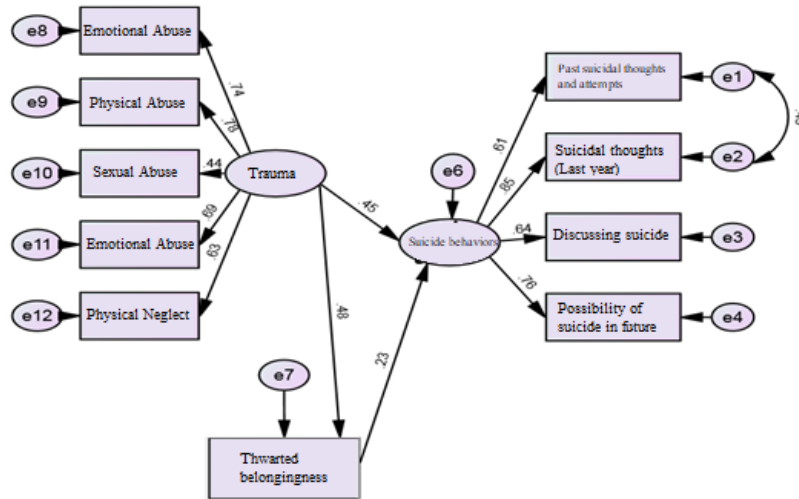
Table 5

Direct effects

Independent variable	Dependent variable	(β)	t	p
Childhood traumas	Thwarted belongingness	0.48	7.833	< 0.001
Childhood traumas	Suicide behavior	0.45	5.646	< 0.001
Thwarted belongingness	Suicide behavior	0.23	3.808	< 0.001

As shown in Table 5, the t-value in all paths is greater than ±1.96, indicating the significance of these paths.

To determine the significance of the predictive model's relationship between suicide behavior based on childhood traumas with the mediation of thwarted belongingness, the Sobel test (using the following formula) was used.

$$Z - value = \frac{a * b}{\sqrt{(b^2 * s_a^2) + (a^2 * s_b^2) + (s_a^2 * s_b^2)}}$$

Table 6

Indirect effects

Independent variable	Mediator	Dependent variable	Indirect effect	Z	p
Childhood traumas	Thwarted belongingness	Suicide behavior	0.110	3.680	< 0.05

According to the data in Table 6, in predicting suicide behavior through childhood traumas with the mediation of thwarted belongingness, the z-value is greater than ±1.96 (P<0.001), indicating the significance of this path. It can be

concluded that there is a significant relationship between childhood traumas and suicide behavior mediated by thwarted belongingness with a coefficient of 0.110. The closer the indirect coefficient of the mediating variable is to

one, the stronger their role. Considering the results obtained in the present study, the variable thwarted belongingness plays a minor role as a mediating variable.

4. Discussion and Conclusion

The present research aimed to provide a causal model for predicting suicidal behavior based on childhood traumas and the mediation of thwarted belongingness among suicide attempters. Overall, the results of this study showed that childhood traumas play a direct and indirect role in suicidal behavior through the mediation of thwarted belongingness.

In this study, there was a significant positive relationship between early childhood traumas and suicidal behavior, consistent with a few studies (Ahmadboukani et al., 2022; Goldberg et al., 2019; Roy, 2011). Childhood adversities lead to an increase in suicidal thoughts, planning, and attempts. Children who experienced sexual and/or physical abuse during childhood showed more signs of anxiety, depression, suicidal thoughts, and behavior, and perceived lower social support (Goldberg et al., 2019).

The interpersonal theory of suicide states that if an individual is exposed to painful stimuli, they gradually become less responsive to fear and pain, and conversely, their sense of relief and painlessness increases. This process leads to the formation of acquired capability for suicide. As a result, childhood injuries, suicide attempts, war, witnessing others' suicide, family history of suicide, and impulsivity increase the acquired capability for suicide (Van Orden et al., 2010; Wan et al., 2019). However, childhood traumas are a dangerous yet modifiable factor in psychopathology (Dunn, 2020). Among childhood traumas, emotional abuse during childhood is most strongly associated with suicidal attempts (Klonsky, Qiu, & Saffer, 2017; Uddin et al., 2019). In the present study, despite assurances of confidentiality, concerns about recording information in medical records, creating a bad record, and fear of family members learning about a history of sexual abuse led participants to respond conservatively to the childhood trauma questionnaire. Additionally, the present study assessed the cumulative effects of childhood traumas.

In this study, a significant positive relationship was found between thwarted belongingness and the total score of suicidal behavior, in line with some previous studies (Brown et al., 2019; Chodkiewicz & Gruszczyńska, 2020). Since thwarted belongingness is associated with various aspects of suicidal behavior, a reduction in the sense of belonging in families among youths (increased thwarted belongingness)

likely increases the probability of suicidal thoughts (Knapp, 2020). In fact, a sense of belonging can be as important as food, shelter, and physical security for long-term health and survival (Brown et al., 2019). There is a strong relationship between physical, sexual, and emotional childhood traumas and the theoretical structure of interpersonal theory. In other words, emotional abuse can predict thwarted belongingness, and physical abuse can predict acquired capability (Smith et al., 2018). Therefore, having a sense of belonging to families and social groups and avoiding isolation play a preventive role in reducing thwarted belongingness and suicidal behavior. The global reduction in suicide rates during the COVID-19 pandemic due to receiving a sense of support from society and family highlights the importance of having a sense of belonging in humans.

The results of the causal model evaluation regarding the indirect effect of childhood traumas on suicidal behavior through the mediation of thwarted belongingness using the Sobel method are in line with the findings of some other studies (Hsieh et al., 2022; Uddin et al., 2019). Generally, childhood traumas are a recognized risk factor for suicidal behavior (Chodkiewicz & Gruszczyńska, 2020; Hsieh et al., 2022), and childhood experiences are directly related to suicidal ideation (Bartlett & Steber, 2019).

According to the interpersonal theory of suicide, when an individual becomes accustomed to pain, fear, and violence, an acquired capability for death is created. Habituation to pain can occur directly, such as through suicide attempts, or indirectly, such as through childhood abuse. From the perspective of interpersonal theory, acquired capability for suicide includes fearlessness of death and increased pain tolerance. Childhood traumas raise an individual's pain tolerance and increase the acquired capability for suicide. Also, individuals with higher thwarted belongingness are at greater risk in terms of suicidal thoughts or history (Angelakis, Austin, & Gooding, 2020). Therefore, thwarted belongingness positively correlates with suicidal behavior (Chodkiewicz & Gruszczyńska, 2020). When individuals belong to a community where they feel loved and valued, the likelihood of their dying by suicide is reduced (Nap et al., 2020). According to the interpersonal theory of suicide, childhood traumas, family problems, and domestic violence increase feelings of thwarted belongingness and perceived lack of reciprocal care (Van Orden et al., 2010). Therefore, childhood traumas can lead to a tendency towards suicidal behavior by creating feelings of loneliness, anxiety of rejection, stress, negative emotions, and suppression of emotions.

5.   Limitations & Suggestions

The results of this study showed that childhood traumas have a direct and indirect role in suicidal behavior through the mediation of thwarted belongingness. Therefore, preventing childhood traumas in society, families, and schools, and then identifying and treating individuals affected by childhood traumas, as well as assessing the need for belongingness, seem effective in preventing and reducing suicidal behavior.

According to reports in 2019, Iran is among the countries with a low prevalence of suicide (2.5 per 100,000 people), but targeted prevention measures for suicide should consider a wide range of cultural and socio-economic contexts of countries (Uddin et al., 2019). Since ten percent of suicide attempters reattempt suicide within ten years (Das & Mishra, 2019), identifying and treating affected individuals can prevent the occurrence and recurrence of suicide. Assessing the history of childhood traumas and thwarted belongingness during medical history taking and clinical interviews, and applying therapeutic approaches will help prevent future suicidal behavior. Due to this research being conducted in a hospital and at patients' bedside, it faced limitations, including that patients' weakness due to the effects of suicide attempts could influence their responses. Also, in the present study, convenience samples were used, which necessitates caution in generalizing the results. Future research should utilize the variables of this study in other suicide-related studies.

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