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Letter to the Editor

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The Mediating Effect of Embitterment on the Relationships between Anxiety, Depression, and Suicidality

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Dear Editor,

World Health Organization (WHO) considers suicide a global phenomenon, and approximately 800,000 people take their own lives every year. Mood and anxiety disorders have mainly been investigated as predictors of suicidal ideation or attempt [1, 2]. However, because not all anxious or depressed individuals commit suicide, other factors or underlying mechanisms should be analyzed. In this study, we focused on the influence of embitterment on the relationships between anxiety, depression, and suicidality. The main characteristics of embitterment involve the emotions of anger, disdain, hatred, disappointment, and hopelessness [3]. When embitterment symptoms worsen, they might develop into posttraumatic embitterment disorder (PTED). Even though a high degree of comorbidity between PTED and other psychiatric disorders, such as major depressive disorder or generalized anxiety disorder, has been reported [4], the precise relationships among these symptoms have not been investigated. Furthermore, embitterment has been associated with suicidal or aggressive ideation [5], which is supported by the fact that individuals with chronic embitterment tend to react to emotional distress through vengeful or aggressive acts. Therefore, we hypothesized that embitterment mediates the relationships between anxiety and suicidality and between depression and suicidality.

The sample comprised 209 participants. Based on the results of the Mini-International Neuropsychiatric Interview, the participants were categorized into a patient group or a healthy group. The patient group included 98 individuals (female = 69.4%; mean age = 42.68 years, range: 19–79) diagnosed with a mood and/or anxiety disorder and no history of psychotic symptoms. About 60.2% of the individuals in the patient group were being treated with medication. The healthy group included 111 individuals (female = 73.0%; mean age = 37.61 years, range: 19–76). We utilized self-reported measures to examine psychological symptoms of all participants. PTED-Self Rating Scale, Beck Anxiety Inventory (BAI), Beck Depression Inventory-II (BDI-II), and Suicidal Questionnaire-revised (SBQ-R) were included in this study. The mediation analysis was performed using AMOS 20.0. The calculated fit indices were the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). For indirect (mediation) effects, Shrout and Bolger [6] suggested using a bootstrapping procedure. When the 95% confidence interval (CI) of the estimated indirect effects do not include

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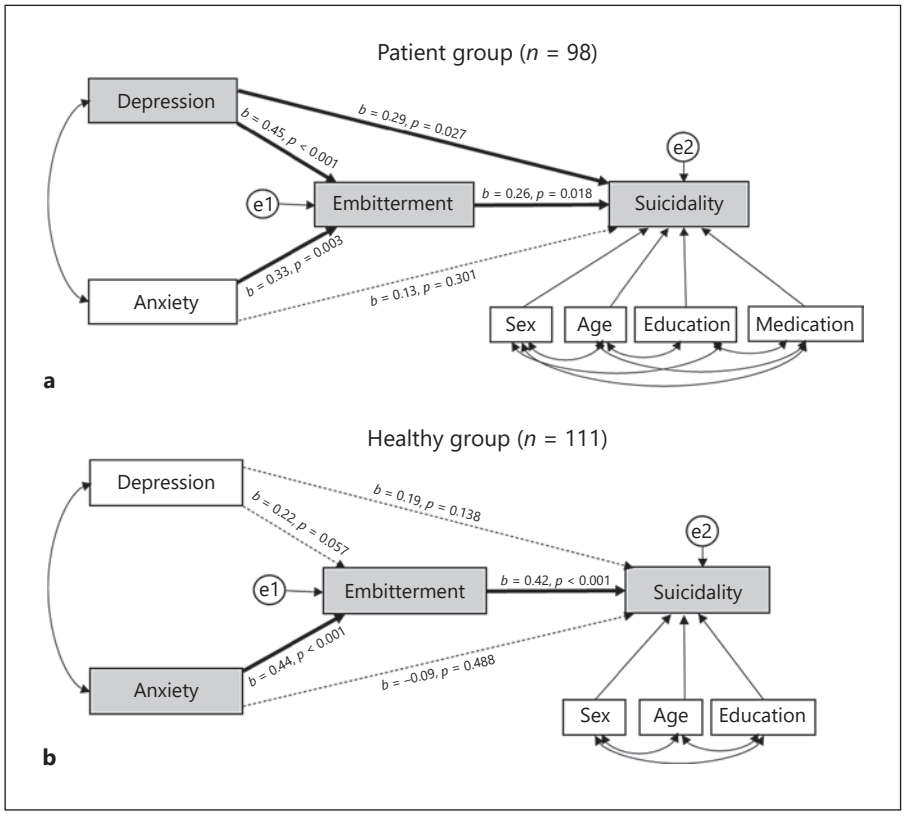

Fig. 1. Path diagrams of the direct effects of depression and anxiety on suicidality and the direct and mediation effects of embitterment on suicidality in (**a**) the patient group and (**b**) the healthy group.

zero, then the indirect effects are statistically significant at the $p < 0.05$ level [6]. Sobel tests were performed to confirm the statistical significance of the mediation effects. Details on the methodologies are provided in the online supplementary material (for all online suppl. material, see www.karger.com/doi/10.1159/000506647).

The result showed that the percentage of participants with a mean PTED score of 2.5 or higher was 37.8% in the patient group, which was the cutoff score to indicate the clinically significant intensity of reactive embitterment [7]; however, none of the participants in the healthy group met the criteria. Next, we assessed two mediation models (see the online suppl. Material) to determine the model most suitable for explaining the relationships between embitterment, anxiety, depression, and suicidality. Model 1 fit was superior to Model 2 in both groups. Model 1 fit indices for the patient group were: $\chi^2(9) = 11.423$, $p = 0.493$; CFI = 1.00; TLI = 1.005; RMSEA = 0.00; and AIC = 75.423. Depression had a direct effect on suicidality ($b = 0.29$, $p = 0.027$), a direct relationship to embitterment ($b = 0.45$, $p < 0.001$), and an indirect effect on suicidality mediated by embitterment ($b = 0.118$ [CI: 0.004, 0.312], $p = 0.042$). The direct relationship between anxiety and suicidality was not statistically significant ($p = 0.301$), but anxiety was directly related to embitterment ($b = 0.33$, $p = 0.003$) and indirectly related to suicidality through embitterment ($b = 0.088$ [CI: 0.011, 0.206], $p = 0.025$). However, the Sobel test was statistically significant only for the relationship between depression and suicidality (depression: $Z = 2.07$, $p = 0.039$; anxiety: $Z = 1.87$, $p = 0.061$; Fig. 1a).

The fit indices of Model 1 for the healthy group were: χ^2 (9) = 14.069, $p = 0.120$; CFI = 0.973; TLI = 0.938; RMSEA = 0.072; and AIC = 66.069. Depression was not directly related to either suicidality or embitterment. Anxiety was not directly related to suicidality, but its influence on embitterment was significant ($b = 0.44$, $p < 0.001$) and it had a significant indirect effect on suicidality through embitterment ($b = 0.183$ [CI: 0.051, 0.454], $p = 0.006$) (Fig. 1b). The Sobel test results confirmed the significance of the mediation effect ($Z = 2.74$, $p = 0.006$).

The first important finding was that 37.8% of the participants in the patient group had a clinically significant intensity of reactive embitterment, whereas no one in the healthy group scored that high. A previous study reported that about 52.1% of the inpatients diagnosed with PTED

fulfilled the criteria for major depression, and 35.4% of them met the generalized anxiety disorder criteria [4]. Given the high PTED comorbidity with other psychiatric disorders, clinicians need to consider embitterment when they assess mood and anxiety disorders.

Second, embitterment significantly mediated the relationship between depression and suicidality in the patient group. This implies that suicidal ideation or behavior might increase among the patient group when they experience embittered emotions. The embittered emotion involves blaming oneself, feeling helpless, and rumination, which have been identified as risk factors of suicidal ideation or behaviors [8, 9]. Thus, feeling embittered, which has these maladaptive emotional regulations, might amplify the link between depression and suicidality.

In addition, embitterment significantly mediated the relationship between anxiety and suicidality in the healthy group. Batterham et al. [2] found that a large proportion of suicidal ideation was attributable to anxiety symptoms such as worry and irritability. It is stated that embittered individuals are more easily irritated and likely to avoid certain places or persons that remind them of the focal event or experience [7]. Therefore, when anxious individuals experience chronic embitterment, they might suffer emotional dysregulation, which is associated with suicidal ideation or behaviors [10]. However, this idea needs further study to investigate the mechanisms that underlie the relationships.

In conclusion, this study revealed that embitterment mediated the relationships between anxiety, depression, and suicidality. However, the study has some limitations to consider. First, future studies are needed to identify the reasons for the mediation effects. Second, the self-report measures could have been biased. Third, to infer causality of the mediation effects, longitudinal designs are needed. Despite its limitations, clinicians should account for the presence and extent of embitterment in their patients to help reduce their suicidal thoughts and behaviors.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Y. Kim and S.-H. Lee: conception and design. Y. Kim, S.Y. Baik, and K.-H. Choi: acquisition of data. Y. Kim and M.J. Jin: data analysis. Y. Kim, S.Y. Baik, M.J. Jin, and S.-H. Lee: writing of the manuscript and interpretation of the data. All authors are familiar with the content, take responsibility for the completeness and accuracy of the content, and have approved the final version of the manuscript.

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