# Immune Function and Mental Health among College Students with Chronic Illnesses: Examining the Impact of Trait Mindfulness

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## Abstract

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*Keywords:* health psychology, trait mindfulness, chronic disease, depression, suicidality

## Immune Function and Mental Health among College Students with Chronic Illnesses: Examining the Impact of Trait Mindfulness

### Introduction

Chronic diseases are persistent conditions that require ongoing medical attention and often impair daily functioning. These diseases remain among the leading causes of death in both the United States and worldwide (World Health Organization, 2023). Globally, one third of the population suffers from different kinds of chronic diseases (Hajat & Stein, 2018). Regardless of an individual's status, approximately one half of young adults identified as having one or more chronic conditions Watson et al. (2022). The present study aimed to examine the association between immune function and mental health, and whether the relationship between poor immune function and poor mental health is moderated by trait mindfulness (See Figure 2) among young adults who endorsed having a chronic illness. The experience of chronic disease(s) impacts a large portion of young adults globally (World Health Organization, 2023);(Watson et al., 2025) , yet research around mental and physical health difficulties among young adults with a chronic disease is limited.

### Method

The data analyzed for the present study only relates to those who indicated having a chronic disease in the baseline survey, and completed the measures for trait mindfulness, immune function, and depression and suicidality. Chronic illness was assessed using a single yes/no question: 'Do you have a chronic disease?'. Participants who answered 'yes' were asked to specify their condition(s) from a write-in option.

### Participants

Participants were university students from six countries recruited to participate in a longitudinal cross-national study examining the prospective effects of COVID-19 on mental health and substance use behaviors (for more information see BLINDED FOR REVIEW). The students were recruited from the U.S. (five universities across three states: Colorado, New York, Virginia), Argentina (one university located in the Cordoba region), Spain (two universities located in the autonomous community of

Andalusia), England (Devon region), Canada (one university located in the province of Ontario) and South Africa (one university located in Cape Town) between March 2022 and June 2023. Participants completed the same battery of measures translated into the native language (English or Spanish).

## Materials and Procedure

Study procedures were approved by the institutional review boards (or the international equivalent) for each participating university. Importantly, invariance testing of all appropriate measures demonstrated metric invariance across the countries, which is necessary when examining associations between study constructs across different groups. For all constructs, items were averaged or summed such that higher scores indicate higher endorsement of that construct.

## Data Analysis

Moderation analyses were conducted using Model 1 of the PROCESS 4.1 macro for SPSS. Analyses included ten models such that immune function, a unique mindfulness facet, and their interaction were entered as statistical predictors of depression (5 models) and suicidal ideation (5 models). In each model, sex at birth, age, and other mindfulness facets were entered as covariates. Variables were standardized to produce standardized regression coefficients.

## Results

Bivariate correlations for all study variables are reported in Table 1. The strongest associations were between depression and acting with awareness (r = -.55, large effect) and depression and non-judging (r = -.54, large effect). Immune function showed moderate associations with depression (r = .47) and small-medium associations with suicidality (r = .26). All mindfulness facets except observing were significantly negatively correlated with both mental health outcomes and immune function.

In examining interaction effects on depression, we found no significant interaction effects. However, significant main effects were found such as poor immune function was associated with higher depressive symptoms across levels of trait mindfulness in each model (B = .27).

| Poor Immune Function | Acting with Awareness | Improved Mental Health Outcomes |
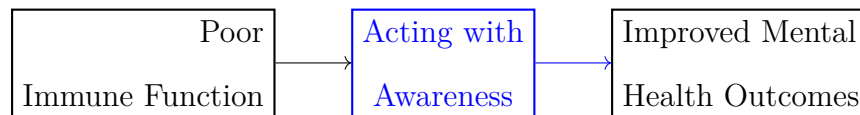
**Figure 1**

*Acting with Awareness as a Potential Protective Factor.*
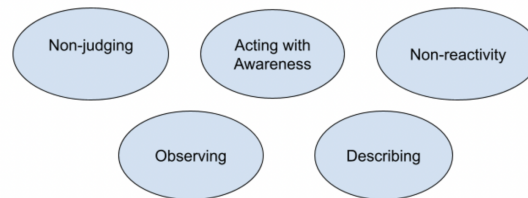


**Figure 2**

*The Five Facets of Mindfulness.*

Acting with awareness (interaction B = -.17), describing (interaction B = -.09) and non-judging on inner experience (interaction B = -.20) significantly moderated the relation between immune function and suicidal ideation. Specifically, the association between immune function and suicidal ideation was strongest among individuals with lower levels of acting with awareness: low level (B = .29), average level (B = .12), and high level (B = -.05), lower levels of non-judging on inner experience: low level (B = .30), average level (B = .10), and high level (B = -.10), and lower levels of describing: low level (B = .21), average level (B = .12), and high level (B = .03).

## Discussion

The present study investigated the association between immune function, depression, suicidality, and trait mindfulness among individuals who self-report having a chronic illness. Specifically, we examined the moderating effects of trait mindfulness in the link between immune function and mental health. Our findings suggest that the acting with awareness, describing, and non-judging facets of mindfulness are significant moderating factors in the relationship between poor immune function and suicidality among university students who endorsed having a chronic illness (See Figure 1). Further, we found that the acting with awareness and non-judging facets of mindfulness independently were associated with lower depressive symptoms, while controlling for the

**Table 1**

*Bivariate correlations among study variables.*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Immune Status | .68 |  |  |  |  |  |  |  | 8.28 | 4.59 |
| 2. Depression | .469 | .90 |  |  |  |  |  |  | 34.48 | 10.92 |
| 3. Suicidality | .255 | .593 | .87 |  |  |  |  |  | 8.66 | 4.38 |
| 4. Observing | .181 | .151 | .047 | .77 |  |  |  |  | 3.20 | 0.73 |
| 5. Describing | -.164 | -.279 | -.229 | .179 | .91 |  |  |  | 3.20 | 0.90 |
| 6. Acting with Awareness | -.315 | -.546 | -.343 | -.204 | .342 | .89 |  |  | 3.01 | 0.83 |
| 7. Non-judgment | -.295 | -.543 | -.467 | -.193 | .299 | .521 | .90 |  | 3.02 | 0.91 |
| 8. Non-reactivity | -.168 | -.225 | -.166 | .216 | .329 | .171 | .190 | .72 | 2.91 | 0.63 |

Note. Cronbach's alphas are underlined and shown on the diagonals. Significant associations are in bold typeface for emphasis and were determined by a 95% bias-corrected standardized bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. Correlations with covariates (i.e., sex at birth and age) are not presented for parsimony but are available on the OSF page.

effects of immune function; however, these facets of mindfulness did not moderate the relationship between immune function and depressive symptoms. Taken together, these findings highlight the potential protective role of mindfulness in mental health and immune functioning.



**Figure 3**

*Yet another figure caption here.*

References

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