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Mediating Role of Self-esteem in the Relationship of Mindfulness to Resilience and Stress

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Abstract: *The present study seeks to examine the effect of mindfulness on resilience and stress and whether it would be mediated by self-esteem. Participants include 462 undergraduates (314 males and 148 females) from Indian university completed mindfulness, self-esteem, resilience and stress scales. Structural Equation Modeling (SEM) indicated that self-esteem acted as a full mediator of the association between mindfulness and resilience. Self-esteem also acted as a partial mediator between mindfulness and stress. A multi-group analysis also indicated that the paths in the mediational model were not moderated by gender, supporting the robustness of the model. The findings suggest that mindfulness and self-esteem play an influential role in mental health promotion.*

Keywords: *Mindfulness; Self-esteem; Resilience; Stress*

INTRODUCTION

Mindfulness is considered to be a state of consciousness that incorporates self-awareness and attention with core characteristics of being open, non-reactive, and non-judgemental (Brown & Ryan, 2003; Kabat-Zinn, 2003). Mindfulness refers to attention to one's experiences in the present moment with openness, curiosity, and acceptance (Bishop et al., 2004). Brown and Ryan (2003) further conceptualized mindfulness as an enhanced awareness and attention of the current activity or present reality. Mindfulness can also be considered as a trait, or stable tendency to be mindful in everyday life (Brown & Ryan, 2003). The tendency to be mindful can be increased through mindfulness-based interventions (Khoury et al., 2013).

Mindfulness, Resilience and Stress

Mindfulness may foster resilience as higher mindfulness levels in people make them able to respond to difficult situations without reacting in non-adaptive and automated ways. Mindful people can better cope with difficult emotions and thoughts without becoming overwhelmed, as they tend to be more creative and are open to new perceptual categories (Langer & Moldoveanu, 2000; Wallace & Shapiro, 2006). Mindfulness may lead to less rumination and habitual worrying, leading to higher resilience (Shapiro et al, 2007; Verplanken & Fisher, 2014). Thompson, Arnkoff, and Glass (2011) reported in a review of mindfulness and resilience to trauma; that mindfulness promotes psychological resilience following trauma by an accepting orientation toward experiences.

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Higher mindfulness levels may lead to lower levels of perceived stress due to reduced negative cognitive appraisals of challenging and threatening events and experiences (Weinstein et al., 2009). An individual's ability to cope with life's stressors also gets enhanced with mindfulness meditation (Shapiro et al., 2007). Mindfulness practice facilitates a quicker return to a state of equilibrium from a stressor, due to enhanced awareness of arousal from that stressor (Hayes & Feldman, 2004; Kabat-Zinn, 1990). Mindfulness may reduce the tendency to perceive situations in stress-inducing ways (Shapiro et al., 2007). People with higher levels of mindfulness are less likely to appraise their day-to-day experiences as stressful (Weinstein et al., 2009). Individuals with a high level of mindfulness regulate their emotions to meet their needs as they behave in ways that are consistent with their values. Thus they are more likely to adapt to stressors in their environment (Brown & Ryan, 2004; Palmer & Rodger, 2009).

Self-esteem as mediator

Self-esteem is defined as "a person's appraisal of his or her value" (Leary & Baumeister, 2000). According to Rosenberg (1989), high self-esteem "expresses the feeling that one is 'good enough.' The person does not consider himself superior to others, but he feels that he is a person of worth. Robins, Trzesniewski, and Donnellan, (2012) proposed that well-designed interventions can be employed for enhancing self-esteem levels of individuals. Correlational studies have demonstrated that mindfulness may contribute to development of higher levels of self-esteem (Brown & Ryan, 2003; Park & Dhandra, 2017; Pepping et al., 2013). Mindfulness may enhance self-esteem by increasing awareness and describing of experiences. The enhanced self-esteem makes people less likely to experience critical thoughts or negative beliefs and encourages people to focus on present experiences (Pepping et al., 2013). The increased self-esteem acts as a capacity to enhance

indomitableness of individuals, leading to higher levels of hope, optimism, and resilience. Thus enhanced self-esteem increases levels of resilience (Karatas & Cakar, 2011). Also, Self-esteem has a close relationship with stress, and self-esteem is more likely to reduce stress levels (Bi et al., 2016). Individuals having low levels of self-esteem tend to believe that they are not competent, significant, or worthy and may try to cope with the negative feelings associated with low self-worth, potentially leading to a heightened level of perceived stress (Eisenbarth, 2012). High self-esteem reduces stress levels by buffering the person against stress and other negative emotions (Leary et al., 1995).

Thus, considering the robust relation between self-esteem and resilience (Arslan, 2015; Fontaine et al., 2017; Karatas & Cakar, 2011; Martínez-Martí, & Ruch, 2017) and between self-esteem and stress (Bi et al., 2016; Mann et al., 2004) and the important role of mindfulness in self-esteem (Brown & Ryan, 2003; Pepping et al., 2013**)**, it is hypothesized that self-esteem mediates the relation of mindfulness to resilience and stress. Thus, mindfulness would predict increased levels of self-esteem, which would, in turn, predict enhanced resilience and reduced stress levels. We also conducted multi-group analysis to identify whether the path coefficients differ significantly between females and males. Inspection of each path coefficient further confirmed that all the associations were similar in magnitude for male and female groups. These results provide preliminary support for the robustness of the final meditational model. To our knowledge, no study has been encountered to examine the mediation effect of self-esteem on the relationship between mindfulness to resilience, and stress. This study extends prior research on mental health by adding insights about the impact of mindfulness and self-esteem on resilience, and stress. The findings contribute to the enrichment of the field of mindfulness as well.

Students at a university often have high levels of stress due to the heavy burden of studies, relationship issues, and financial problems. University students also need to adapt to a new phase of life, and for that, they need higher resilience levels. Resilience helps individuals cope with adversity and achieve good adjustment and development during trying circumstances (Connor & Davidson, 2003). Therefore in this period, students may not only need to reduce stress levels but also to enhance their resilience levels. Thus, the current study might throw some light on understanding the potential psychological mechanism in helping university students in enhancing their mental health by the enhanced resilience and reduced stress levels. This will also allow clinicians and researchers to develop interventions that specifically address and target underlying processes.

METHOD

Participants and Procedure

Four hundred and sixty two undergraduate students volunteered to take part in the study. Students were recruited from an Indian university. Faculty members invited students to participate in the study, and informed consent was also obtained from the willing participants. Students were not compensated for their participation. The sample consisted of 314 males and 148 females with mean age 20.0 years (SD=1.0 years). In a classroom environment participants were administered a packet of paper-and-pencil questionnaires. All the participants were ensured of the confidentiality of their responses. It took approximately 15 minutes for the students to complete the surveys. The study was exempt from ethics committee approval since our study did not involve human clinical trials or animal experiments.

Measures

Mindfulness

Participants' mindfulness scores were measured with the 15-item Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003). The respondents expressed when they lack mindfulness on a six-point rating scale that ranged from "almost always," to "almost never." Example items are: ''I find myself doing things without paying attention" and ''I find myself listening to someone with one ear, doing something else at the same time.'' In the present study, the Cronbach alpha coefficient for the MASS was 0.82.

Self-esteem

Participants' self-esteem scores were measured by the 10 item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The sample items of RSES are, "I feel that I have a number of good qualities." and "I feel that I'm a person of worth." In previous studies the RSES has demonstrated good levels of validity and reliability (Yu et al., 2016). In the present study, the Cronbach alpha coefficient for the RSES was 0.80.

Resilience

Participants' resilience scores were measured using The Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). We used the 10 item version of CD-RISC was used to measure resilience levels. This scale includes items such as ''Coping with stress can strengthen me'', and ''Tends to bounce back after illness or hardship.'' In previous studies CD-RISC scale has demonstrated good levels of validity and reliability (Campbell-Sills & Stein, 2007; Chen et al., 2016). In the present study, the Cronbach alpha coefficient for the CD-RISC was 0.85.

Stress

Participants' stress scores were assessed with seven items adapted from Depression Anxiety Stress Scales short version-21 (DASS; Lovibond & Lovibond, 1993). The scale includes items such as, "I tended to over-react to situations" and "I found it difficult to relax." In previous studies, The DASS -21 has demonstrated to be a reliable and valid measurement in assessing stress scores (Davis

Table 1
Mean, Standard Deviations (SD), reliabilities, and intercorrelations among study measures

Measure	Mean	SD	α	1	2	3
1. Mindfulness	3.9	0.75	0.82			
2. Self-esteem	2.9	0.43	0.80	0.39**		
3. Resilience	2.6	0.60	0.85	0.25**	0.49**	
4. Stress	1.04	0.51	0.72	-0.32**	-0.35**	-0.24**

Note: α: Cronbach's Alpha

**Correlation is significant at the 0.01 level (2-tailed)

et al., 2016; Hamill et al., 2015). In the present study, the Cronbach alpha coefficient for the DASS was 0.80 for stress.

Data Analysis

First, an initial correlational analysis was used to examine the relationships between mindfulness, self-esteem, resilience, and stress. The mediation role of self-esteem was tested using two-step Structural equation modeling (SEM) procedure using AMOS 18.0. A bias-corrected bootstrapping procedure was also employed to test the significance of the mediation effects of self-esteem. 10000 bootstrapping samples were generated according to random sampling using the data set (N=462). Firstly, the measurement model was calculated. After getting satisfactory results of the measurement model, we tested the structural model in the AMOS Software. The fit of the model to data was evaluated by calculating some indices recommended by Hu and Bentler (1999) and Kline (2011). Accordingly, goodness-of-fit criteria were used in the current study that acknowledged the potential for acceptable fit ($\chi 2/df<3$, CFI>0.90, SRMR<0.10, RMSEA<0.08) and excellent fit ($\chi 2/df<2$, SRMR<0.08, RMSEA<0.06, CFI>0.95). As each latent factor was having multiple items, we divided the items into parcels to control inflated measurement errors. Parcels were created using an item-to-construct balance approach (Little et al., 2002). We divided the items for each of the mindfulness, self-esteem, and resilience latent factors into three parcels and for stress latent factor two parcels were formed.

RESULTS

Measurement Model

The descriptive statistics, reliability estimates (Cronbach's alpha coefficients), and the correlations for all study constructs are presented in Table 1. All study constructs were found to be significantly correlated. The measurement model contained four latent constructs (mindfulness, self-esteem, resilience, and stress) and 11 observed variables. A test for measurement model generated an excellent fit to the data. $\chi 2=54.32$, df=38; p=0.042; RMSEA=0.031; SRMR=0.015; and CFI=0.992. All factor loadings on the latent constructs were found significant.

Structural Model

To test the proposed structural relationships among study variables we used SEM procedure using AMOS 21.0. A partially mediated model (Model 1) with self-esteem as a mediator of mindfulness to resilience and stress was tested. Model 1 with direct paths from mindfulness to resilience, and stress showed excellent fit to data: $\chi 2=54.32$, df=39, p =0.052; RMSEA=0.029; SRMR=0.015; and CFI=0.992. The results of Model1 showed that the direct path coefficient from mindfulness to resilience (b=0.006, p=0.899) was not significant and therefore we tested Model 2 after trimming the insignificant path from mindfulness to resilience. The results of Model 2 also indicated excellent fit to data: $\chi 2=54.34$, df=40, p=0.065; RMSEA=0.028; SRMR=0.015; and CFI=0.993. The Model 2 was found better than Model 1, as Model 2 showed excellent fit to data with less estimated parameters ($\Delta\chi 2$ (1, N=462) =0.02, p>0.05).

Another model, (Model 3) was tested having resilience, and stress as mediators of mindfulness to self-esteem. Model 3 fit indices were found inferior to fit indices of Model 1 and Model

Table 2
Fit Indices among Competing Models.

	χ2	df	χ2/df	RMSEA	SRMR	CF1	AIC	ECVI
Model 1	54.32	39	1.39	0.029	0.015	0. 992	108.32	0.235
Model 2	54.34	40	1.36	0.028	0.015	0.993	106.34	0.231
Model 3	63.35	39	1.62	0.037	0.020	0.988	117.35	0.255

Note: N = 462, RMSEA= root mean square error of approximation; SRMR= standardized root-mean-square residual; CFI=comparative fit index; AIC=Akaike information criterion; and ECVI=expected cross-validation index.

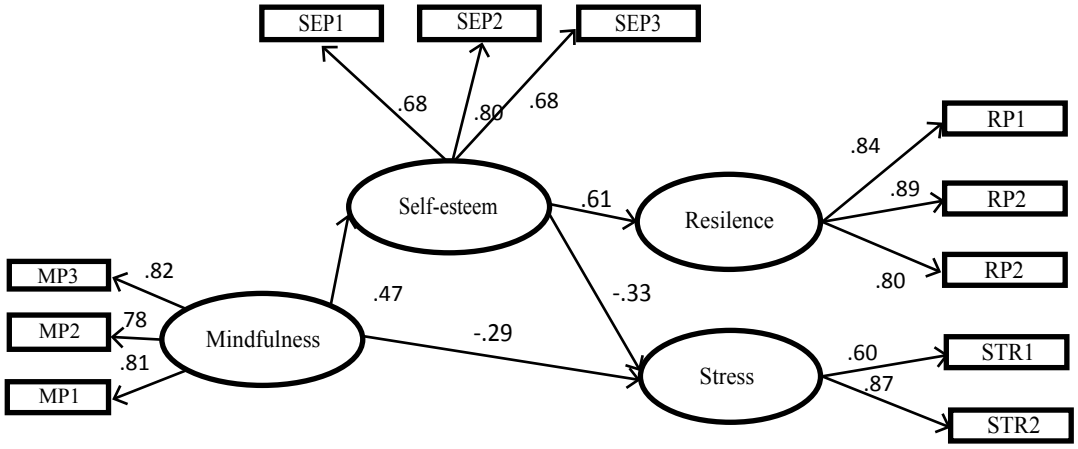

Figure 1. The Structural Equation Model regarding the mediating effect of self-esteem in the relationship of mindfulness to resilience, and stress. Note: Factor loadings are standardized. MP1–MP3=three parcels of mindfulness; SEP1–SEP3=three parcels of self-esteem; RP1–RP3=three parcels of resilience; STR1-STR2=two parcels of stress.

2: $\chi 2$=63.35, df=39, p=0.008; RMSEA=0.037; SRMR=0.020; and CFI=0.988. We tested Model 4 with mindfulness mediating the relationship of self-esteem to resilience and stress. In this model (Model 4) mindfulness didn't play mediating role in the relationship of self-esteem to resilience as the 95% confidence intervals contained zero [-0.059, 0.062]. The fit indices of the four alternative models are presented in Table 2.

From all the four models tested, the Model 2 was the best one. For Model 2, a bias-corrected bootstrapping procedure was employed to test the significance of the mediation effects of self-esteem. 10000 bootstrapping samples were generated according to random sampling using the data set (N=462). The bootstrapping results of indirect effect of mindfulness on resilience, and stress produced bias corrected 95% confidence intervals that don't include zero (point estimate=0.29, [0.22, 0.37]) and (point estimate=-0.16, [-0.24, -0.09]) respectively. Thus mindfulness exerted significant indirect effects on resilience, and stress via self-esteem (Figure 1). Thus, the relationship of mindfulness to resilience was fully mediated by self-esteem. However, the relationship of mindfulness to stress was partially mediated by self-esteem as the direct effect of mindfulness on stress was still significant.

Gender Differences

To examine the gender differences the first model (which allows the structural paths to vary across sexes) and the second model (which constrains the structural paths between males and females to be equal) were compared. The invariance in factor loadings was tested between the two groups, and no significant difference was found the first model and the constrained model, $\Delta\chi 2$ (4, N=462) =4.26, p>0.05. This suggested that there were no significant gender differences. Path coefficients for each of the relationships were also tested, and it was found that all paths didn't differ across sexes.

DISCUSSIONS

As predicted, the current study examined mindfulness was positively associated with resilience and negatively associated with stress. Results reported in the current study are consistent with previously reported relationships of mindfulness to resilience, and stress (Soysa, & Wilcomb, 2015; Thompson et al., 2011; Weinstein et al., 2009). We also found that self-esteem was positively associated with resilience and negatively associated with stress. These study findings are consistent with prior research on the relationship of self-esteem with resilience (Arslan, 2015; Karatas & Cakar, 2011), and self-esteem with stress (Bi et al., 2016; Mann et al., 2004).

The most imperative finding of the examination is that mindfulness was associated with resilience and stress through the mediation of self-esteem. The findings indicate that individuals with high levels of mindfulness are prone to have higher levels of self-esteem, which in turn contributed to enhanced resilience, and lowered stress. Self-esteem fully mediated the relationship of mindfulness to resilience. However, the relationship between mindfulness and stress was partially mediated by self-esteem. No significant gender differences were found in the multi-group analysis, indicating the robustness of the mediational model. The study highlights the important role of self-esteem in the relationship of mindfulness to resilience and stress.

The study offers some contribution to the literature as it studies self-esteem as a mediator in the relationship of mindfulness to resilience and stress. To the best of our knowledge, the current study is the first study that has examined the role of self-esteem as a mediator in the relationship of mindfulness to resilience, and stress. This study extends prior research on mental health by adding insights about the impact of mindfulness and self-esteem on resilience, and stress. The findings contribute to the enrichment of the field of mindfulness as well. Thus mindfulness and self-esteem may be considered core elements of mental health promotion.

Our findings provide valuable guidance for enhancing mental health by increasing levels of resilience and reducing levels of stress at the same time. The cultivation of mindfulness may help individuals in recognizing their own sense of worth, which may lead to addressing resilience and stress. Thus the current model may be useful in enhancing overall mental health by increasing levels of resilience and reducing levels of stress at the same time. Our study findings may help in designing interventions focusing on addressing stress and resilience. Programs aimed at increasing both mindfulness and self-esteem is likely to enhance resilience and reduce stress.

Brown et al., 2007 found that secure self-esteem can be promoted by using mindfulness. The secure form of self-esteem is based on acceptance of self-traits and heightened awareness. This is not based on self-evaluative methods and social comparison (Schöne et al., 2015; Woods et al., 2006). Thus, this secure self-esteem based on acceptance of self-traits and heightened awareness may lead to stable resilience and quicker return to a state of equilibrium in the presence of stressors. This may lead to stable enhanced levels of mental health.

We acknowledge some limitations of the current study. First, we collected data from self-reports only, and in future studies, multiple sources of data may be used. Secondly, cross-sectional design was adopted in this study which prevented the study from determining causal relationships. Future studies can employ longitudinal design to examine relations among mindfulness, self-esteem, resilience, and stress.

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