THE STRUCTURAL EQUATION MODEL FOR THE MEDIATING EFFECT OF SELF-ESTEEM IN THE RELATIONSHIP OF MINDFULNESS TO ACADEMIC RESILIENCE AND TEST ANXIETY

Abstract: The purpose of this study was to investigate the mediating effect of self-esteem in the relationship of mindfulness to academic resilience, and test anxiety. Eight hundred undergraduate students volunteered to participate to the study. Students were recruited from the Cairo University. Faculty members invited students to participate in the study, and informed consent was also obtained from the willing participants. The sample consisted of 230 males and 570 females with mean age 19.5 years (SD=3.0 years). The Connor Davidson-Resilience Scale (CD-RISC), and State-Trait Anxiety Inventory–State Anxiety Scale were used to collect data. To examine the relationships between mindfulness, self-esteem, academic resilience, and test anxiety, correlational analysis was used. The mediation role of self-esteem was tested using two steps Structural equation modelling (SEM) procedure using AMOS 18.0. Findings indicated that the correlations between mindfulness, self-esteem and academic resilience were positive while with test anxiety it was in the different path. As predicted, mindfulness was positively associated with academic resilience and negatively associated with test anxiety.

Keywords: structural equation model, self-esteem, mindfulness, academic resilience, test anxiety

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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-judgmental (Brown and Ryan 2003). It is a skill, which enhances adaptive coping to stressful events by the self-regulation of attention towards the immediate experience, and an open and accepting orientation towards one's experience of the present (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. Mindfulness involves the ability to pay attention to the moment, on purpose, without judgment (Kabat-Zinn 2003) and can be regarded as a state or disposition; specifically, individuals can experience moments of mindfulness (state mindfulness) and/or maintain a general ability to be mindful (dispositional mindfulness).

Mindfulness, Academic Resilience, and Test Anxiety

A review of the literature revealed an association between mindfulness and resilience. Chavers (2013) found a significant correlation between mindfulness and resilience, with mindfulness being a significant predictor of resilience. Van (2001) states that mindfulness-based training may be an efficacious intervention for increasing resilience. Keye and Pidgeon (2013) suggest that mindfulness and academic self-efficacy have a significant impact on resilience. Mindfulness-based interventions have been incorporated in schools for anxiety reduction, and recently, studies have examined the effectiveness of mindfulness-based approaches to help elementary (age 9- to 12-years-old) and secondary school students (age 13- to 15-years-old) manage anxiety in test situations (e.g. Arjunan and Joseph 2016). Niss (2012) explored the effectiveness of a brief Mindfulness Intervention on Math's Test Anxiety and Exam Scores in a High School Population. Participants took part in a brief guided meditation directly before sitting their math exam. Participants intervention showed significant reductions in anxiety, as well as improvements in exam scores from before to after the intervention. Cunha and Paiva (2012) research explored the extent to which individuals with high TA were distinguished from those students with low TA in terms of self-criticism, acceptance and mindfulness skills. Their results revealed that students with high TA had significantly higher levels of negative self-criticism as well as significantly lower values of acceptance and mindfulness.

THE MEDIATING EFFECT OF SELF-ESTEEM

Self-esteem refers to an individual's evaluation of his or her own self-worth, and is considered a relatively stable personality trait that varies between individuals (Waterman 1992). Mindfulness is also associated with higher levels of self-esteem (Brown and Ryan 2003). High levels of mindfulness should thus serve as a buffer to low self-esteem, with individuals higher in mindfulness more able to step back from potentially negative thoughts about the self (Pepping, O'Donovan and Davis 2013).

Buckner, Mezzacappa and Beardslee (2003) have observed that resilient adolescents had higher self-esteem. Coleman and Hendry (1990) stated that those possessing high self-esteem have the tendency to be happy, healthy, productive and successful, make persistent effort to overcome the difficulties, sleep better at nights, are less probe to develop ulcer, show less tendency against accepting others and the pressures of their peers; on the other hand, those having low self-respect, are individuals who are worried, pessimistic, having negative thoughts about future and having tendency of being unsuccessful. On the other hand, Zeynep (2011) stated that the individuals having low self-respect exhibit the characteristics, such as expecting failure, being nervous, making less effort, and may ignore the important things in life, also make charges such as worthless and untalented against themselves when they are unsuccessful.

It is hypothesized that self-esteem mediates the relation of mindfulness to academic resilience and test anxiety. Thus, mindfulness would predict increased levels of self-esteem, which would, in turn, predict enhanced academic resilience and reduced test anxiety.

METHOD

PARTICIPANTS AND PROCEDURE

Eight hundred undergraduate students volunteered to participate to the study. Students were recruited from the Cairo University. Faculty members invited students to participate in the study, and informed consent was also obtained from the willing participants. The sample consisted of 230 males and 570 females with mean age 19.5 years (SD=3.0 years). In the lecture rooms, participants were administered the paper-and-pencil questionnaires. It took approximately 20 minutes for the students to complete the questionnaires. Confidentiality of the responses was confirmed.

MEASURES

MINDFULNESS

The Freiburg Mindfulness Inventory (FMI) (Walach et al. 2006) is a 14-item scale measuring an individual's experience of mindfulness. A total mindfulness score is given by summing participants' scores across all items, with greater scores indicating greater levels of mindfulness. The Cronbach's alpha of the scale was 0.93 in this study.

RESILIENCE

The Connor Davidson-Resilience Scale (CD-RISC). The CD-RISC (Connor & Davidson, 2003) is a 25-item scale which rates how individuals have felt over the last month and their stress coping ability. A total score is given by summing an individual's response across all items with higher scores indicating higher levels of resilience. The Cronbach's alpha of the scale was 0.91 in this study.

TEST ANXIETY

State-Trait Anxiety Inventory–State Anxiety Scale. The State Anxiety Scale from the State-Trait Anxiety Inventory (STAI) is a widely used self-report measure assessing adolescents', college students', and adults' current state of anxiety (Spielberger 1989). The state scale contains 20 items for individuals to indicate how they feel in a particular moment in time and takes 5–10 minutes to complete. Items include statements such as 'I am worried' or 'I feel upset' and participants indicate their response on a four-point scale (0¼not at all; 4¼very much so). This measure has been shown to have high internal consistency (_¼0.86–0.96) and test–retest reliability ranging from 0.65 to 0.76. In the present study, Cronbach alphas ranged from 0.88 to 0.90 pre-post-intervention, with a test–retest correlation of 0.78.

DATA ANALYSIS

To examine the relationships between mindfulness, self-esteem, academic resilience, and test anxiety, correlational analysis was used. The mediation role of self-esteem was tested using two step Structural equation modeling (SEM) procedure using AMOS 18.0. The measurement model was calculated. After getting satisfactory results of the measurement model, we tested the structural model in the AMOS Software. 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).

RESULTS

MEASUREMENT MODEL

The results of the data analysis indicating the mean standard deviation and inter-correlation matrix of all variables are shown in Table 1. The correlations between mindfulness, self-esteem and academic resilience were positive while with test anxiety it was in the different path.

Table 1: Descriptive Statistics and Correlations between Variables

Measure	*M*	*SD*	*1*	*2*	*3*	*4*
1.mindfulness	3.2	1.02		0.32**	0.30**	-0.28**
2. self esteem	3.7	2.00	0.32**		0.36**	0.38**
3.resilience	3.1	1.09	0.30**	0.34**		0.37**

4. Test anxiety	3.00	1.08	-0.28**	-0.25**	-0.27**	

Structural Model

AMOS 21.0 was used to o test the proposed structural relationships among study variables. A partially mediated model (Model 1) with self-esteem as a mediator of mindfulness to academic resilience and test anxiety was tested. Model 1 with direct paths from mindfulness to academic resilience, and test anxiety showed excellent fit to data: $\chi2$=62.02, df=41, p =0.054; RMSEA=0.030; SRMR=0.018; and CFI=0.994. The results of Model1 showed that the direct path coefficient from mindfulness to academic resilience (b=0.004, p=0.834) was not significant and therefore I tested Model 2 after trimming the insignificant path from mindfulness to academic resilience. The results of Model 2 also indicated excellent fit to data: $\chi2$=59.02, df=44, p=0.068; RMSEA=0.031; SRMR=0.017; and CFI=0.995. The Model 2 was found better than Model 1, as Model 2 showed excellent fit to data with less estimated parameters ($\Delta\chi2$ (1, N=800) =0.03, p>0.05).

Another model, (Model 3) was tested having academic resilience, and test anxiety as mediators of mindfulness to self-esteem. Model 3 fit indices were found inferior to fit indices of Model 1 and Model 2: $\chi2$=61.37, df=38, p=0.007; RMSEA=0.039; SRMR=0.022; and CFI=0.963. I tested Model 4 with mindfulness mediating the relationship of self-esteem to academic resilience and test anxiety. In this model (Model 4) mindfulness didn't play mediating role in the relationship of self-esteem to academic resilience as the 95% confidence intervals contained zero [-0.060, 0.061]. The fit indices of the four alternative models are presented in Table 2.

Table 2. The fit indices of the four alternative models

	χ2	*df*	*χ2/df*	*RMSEA*	*SRMR*	*CF1*	*AIC*	*ECVI*
Model 1	58.02	42	1.40	0.030	0.018	0.994	106.12	0.244
Model 2	59.02	45	1.34	0.031	0.017	0.995	103.22	0.237
Model 3	61.37	42	1.46	0.039	0.022	0.963	118.32	0.254

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.

Discussion

The purpose of this study was to examine the mediating effect of self-esteem in the relationship of mindfulness to academic resilience, and test anxiety. As predicted, mindfulness was positively associated with academic resilience and negatively associated with test anxiety. Results reported in the current study are consistent with previously reported relationships between resilience and self-esteem Buckner, Mezzacappa and Beardslee (2003), Gordon Rouse, Ingersoll, and Orr (1998), mindfulness and resilience (Chavers 2013), Mindfulness and Test Anxiety (Niss 2012). The results reported in the current study are consistent with the findings of Badri Bajaj's study (2017) which 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.

It was found that self-esteem mediated in the relationship of mindfulness to academic resilience, and test anxiety. This means that individuals with high levels of mindfulness have higher levels of self-esteem, academic resilience and low levels of test anxiety.

These results support Flach's (1989) theory of resilience that suggests mindfulness and self-esteem to be part of the repertoire of psychological strengths, which allow individuals to successfully navigate change.

The current findings have implications for future research as they expand upon current knowledge of self-esteem the mediator in the relationship of mindfulness to academic resilience, and test anxiety.

Through my study I was able to support that a resilient individual was high on self-esteem and also perceived his surroundings to be protective. Positive self-esteem could be seen as an essential feature of mental health and also as a protective factor in the field of health and social behaviour. In contrast, negative self-esteem leads to problems, such as depression, anxiety, violence, high risk behaviours and substance use (Sakshi and Upasana 2013).

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