College Students' Mindfulness, Resilience, Flourishing, and Academic Success: An Exploratory Study from Egypt

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Abstract

Limited research has been conducted on the influence of mindfulness, resilience, and well-being on academic achievement within the context of Arabic culture, particularly in higher education. The main objectives of this study are twofold. Firstly, to establish the validity of the Arabic version of the Mindful Attention Awareness Scale and the Brief Resilience Scale and to assess their factor structure using a sample from Egypt. Secondly, to investigate the proposed model that explores the mediating role of resilience and well-being in the associations between mindfulness and academic outcomes Two separate studies were undertaken, involving a total of 883 college students from Egypt (n1 = 486; n2 = 397). The administration of mindfulness, resilience, and flourishing scales was conducted as a means of measuring well-being. The utilisation of the grade point average (GPA) served as a metric for measuring academic achievement. Grade point average (GPA) scores were calculated by taking the average of the scores achieved in the modules completed during the first semester. The findings of the study indicate that the scales measuring mindfulness and resilience in the Egyptian sample are unidimensional. Significant correlations were observed between mindfulness, resilience, flourishing, and GPA. Two CFA models were analysed, and it was found that the second model exhibited a complete alignment with the data, specifically in relation to the mediator variables of resilience and flourishing. Resilience and flourishing serve as mediators within the association linking mindfulness and grade point average (GPA). There exists a positive correlation between the practice of mindfulness and academic performance, as measured by the grade point average (GPA).

Introduction

The significance of a student's success in higher education institutions is widely recognised as a crucial element for enhancing their personal and professional growth within the prevailing challenging circumstances (York, Gibson, & Rankin, 2015). Education serves as a means of acquiring knowledge, cultivating critical skills and competencies, and providing a basis for future prospects (Jacobi, 1991). In recent years, there has been a growing body of research that has delved into the various complex elements that contribute to achieving academic success. This research has placed particular emphasis on the concepts of mindfulness, resilience, and well-being (Lampe & Müller-Hilke, 2021; McCloskey, 2015).

In order to ascertain the importance of the matter, numerous scholars have conducted investigations into the emotional, psychological, demographic, and social factors that may serve as indicators of academic achievement among college students (Richardson, Abraham, & Bond, 2012; Robbins et al., 2004; Salanova et al., 2010). According to Hamilton (1990) findings, variables such as high school rank, age at enrolment, and the American College Test (ACT) composite score demonstrated a significant association with grade point average (GPA), which is commonly regarded as a measure of academic achievement in post-secondary education. The variables of high school size, college transfer, and high school GPA exhibited a diminished level of significance in predicting GPA at the time of college graduation. The practise of mindfulness has been found to have a significant influence on the flourishing, well-being, and academic achievements of college students (Akin & Akin, 2015; Schutte & Malouff, 2011; Shapiro et al., 2008).

Furthermore, prior research has demonstrated a correlation between mindfulness, resilience, well-being, and academic achievement, yet there remain several areas that have not been adequately explored. Previous research has demonstrated a robust association between mindfulness and resilience (Bajaj & Pande, 2016; Jäger, 2016; Kütük et al., 2023; Pidgeon & Keye, 2014). The concept of mindfulness has been found to have a significant influence on an individual's

overall well-being, as supported by various studies (Brown & Ryan, 2003; Schutte & Malouff, 2011; Shapiro et al., 2008). The impact of mindfulness extends to the domains of flourishing and well-being (Akin & Akin, 2015; Schutte & Malouff, 2011; Shapiro et al., 2008; Wu et al., 2023). Furthermore, it has been observed that the implementation of mindfulness practices has had a positive influence on the achievement of academic goals (McCloskey, 2015; Richardson, Abraham, & Bond, 2012) Furthermore, the findings from structural equation modelling analyses indicate a robust association between resilience and well-being (Burns, Anstey, & Windsor, 2011; Mak, Ng, & Wong, 2011; Zaidi et al., 2023). Further, there exists a correlation between the state of well-being and the academic performance of college students (Ansari & Stock, 2010; Ayyash-Abdo & Sánchez-Ruiz, 2012).

In recent studies, the association between mindfulness, resilience, and academic achievement has been substantiated (Asthana, 2021; Vidal-Meliá et al., 2022; Zarotti, Povah, & Simpson, 2020). Additionally, the connection between mindfulness, resilience, and overall well-being has also been demonstrated (Pidgeon & Keye, 2014; Wu et al., 2023). The research conducted by Berdida, Lopez, and Grande (2023) and Hassed (2008) focused on the examination of mindfulness, well-being, and performance in the context of leaders rather than college students. Limited knowledge exists regarding the associations among mindfulness, resilience, well-being, and grade point average (GPA).

Moreover, empirical evidence has substantiated the existence of positive associations between mindfulness, resilience, and well-being. However, the specific causal direction of these relationships remains unknown. For instance, it is unclear whether resilience can predict well-being. Is there an equal level of resilience and well-being? Is it possible for them to make predictions about another dependent variable? To date, there has been a lack of research examining the relationship between mindfulness, resilience, flourishing, and the prediction of GPA among Arab college-level students. In summary, there is a requirement for research endeavours employing path analysis to elucidate the interconnections between mindfulness, resilience, well-being, and GPA within the context of Egyptian culture.

In order to examine this association, scholarly investigations have implemented two distinct research objectives across two separate studies. (i) The primary objective of the initial study is to authenticate the Arabic adaptations of the mindfulness and resilience scales while also scrutinising their factor structure within a representative sample from Egypt. (ii) The objective of this study is to investigate the interconnections between mindfulness, resilience, well-being, and academic achievement within a sample of individuals from Egypt. Could resilience potentially serve as a mediator in the relationship between mindfulness and well-being? Is it possible for resilience and well-being to act as mediator variables in the associations between mindfulness and GPA?

The correlation between mindfulness, well-being, resilience, and academic success holds substantial implications for college students in Egypt. The validation of the Mindful Attention Awareness Scale and the Brief Resilience Scale offers valuable resources for future research and interventions in the Arabic-speaking world. These tools facilitate a more accurate evaluation of mindfulness and resilience within a specific cultural context. Furthermore, the correlation established between mindfulness and GPA highlights the potential advantages of incorporating mindfulness practices to enhance academic performance. This implies that fostering mindfulness could serve as a beneficial approach for students aiming to improve their educational achievements.

The mediation model, which elucidates the mediating roles of resilience and well-being between mindfulness and academic success, underscores the significance of fostering psychological well-being and resilience within educational environments. The results of this study highlight the importance of comprehensive interventions that address mindfulness, resilience, and well-being in order to enhance academic performance among college students in Arabic culture. The research was conducted in two distinct phases. In the first phase, the research instrument underwent a process of validation. Subsequently, in the second phase, a validated questionnaire was utilised to examine the relationship between the independent variables, mediators, and dependent variables. The study was structured into five distinct chapters, namely the introduction, literature review, methodology, data analysis, discussion, and conclusion.

Literature review and Hypothesis Development

Mindfulness

Mindfulness refers to the deliberate and non-evaluative act of directing one's focus towards the present moment (Kabat-Zinn, 2009). According to the definition provided by Brown and Ryan (2003), mindfulness can be understood as a malleable state of consciousness in which an individual demonstrates heightened attentiveness and a non-judgmental awareness of both their internal and external experiences. An alternative conceptualization of mindfulness pertains to the cultivation of non-judgmental and non-reactive awareness towards oneself and the surrounding environment, with deliberate intentionality. This approach also encompasses the practice of describing one's subjective experiences (Baer et al., 2006). According to Brown and Ryan (2003), the concept can be described as a psychological characteristic denoting an individual's inclination towards being mindful in their daily experiences.

According to previous research (Baer et al., 2008; Falkenström, 2010), the practice of meditation or engaging in training activities has been found to have a positive impact on the development of mindfulness. Furthermore, the practice of mindfulness has the potential to bolster one's resilience, as individuals who cultivate mindfulness are more inclined to exhibit heightened creativity and effectively navigate through challenging emotions and thoughts without succumbing to overwhelm or emotional shutdown. Therefore, individuals who practice mindfulness are more adept at effectively managing and reacting to situations that induce stress (Langer & Moldoveanu, 2000).

Mindfulness can be conceptualised as a cognitive state characterised by heightened awareness and focused attention on the current moment or immediate surroundings. Mindfulness has been defined as possessing a fundamental attribute of open or receptive awareness and attention (Martin, 1997). This phenomenon could potentially manifest as a heightened or prolonged awareness of current events and personal encounters. The concept of attention can be further categorised, such as individuals who are engaged in multiple tasks or individuals who are preoccupied with concerns that hinder their ability to fully engage with their current environment (Brown, Ryan, & Creswell, 2007; MacKillop & Anderson, 2007). In summary, the state of

mindlessness can arise from individuals' deliberate rejection of thoughts, emotions, motives, or perceptions. This statement provides a valid opposing perspective on the concept of mindful presence. Hence, mindfulness exhibits a certain degree of correlation with other concepts that have been subject to scholarly investigation.

Resilience

Resilience is commonly conceptualised as an inherent characteristic that enables individuals to effectively navigate and adapt to challenging circumstances, facilitating their personal growth and development. Resilience is a characteristic that serves as a safeguard for individuals in the face of adversity and traumatic experiences (Connor & Davidson, 2003; Ong et al., 2006). Certain studies view resilience not only as an inherent characteristic but also as a malleable attribute that has the potential to develop and expand over time. Resilient systems possess the ability to facilitate both renewal and innovation in the midst of immediate crises and transformations (Berkes, Colding, & Folke, 2009).

Sources of resilience can be identified within both the individual and the surrounding environment (Windle, Bennett, & Noyes, 2011). Temperance is a crucial element in promoting resilience. There exists a correlation between resilience and reduced intensity of responses to negative events, decreased levels of aggression, and the restoration of interpersonal connections (Cohrs et al., 2013). Nevertheless, there remains ambiguity regarding whether resilience is an inherent and unchanging characteristic of an individual's personality or a fluid and evolving phenomenon (Portzky et al., 2010).

There are multiple justifications that underscore the significance of employing resilience strategies with young individuals. For instance, a significant proportion, exceeding 50%, of individuals encounter at least one traumatic event over the course of their lives. However, the majority of these individuals exhibit resilience and do not manifest any mental disorders as a result (Berkes, Colding, & Folke, 2009; Leontjevas et al., 2014). Not all individuals who undergo a traumatic event will necessarily develop psychopathology. The importance and appeal of studying resilience cannot be overstated, as it is evident that certain individuals possess the ability to be resilient (Agaibi & Wilson, 2005).

In contrast, a notable percentage ranging from 30% to 90% of individuals who undergo such occurrences indicate a heightened level of life satisfaction (Aspinwall & MacNamara, 2005). The cultivation of resilience is imperative in order to attain favourable outcomes following encounters with stressful circumstances (Martz & Livneh, 2016). The utilisation of this intervention has demonstrated beneficial effects on the recovery process of various physical and mental health conditions (Markovitz et al., 2015). Because of these reasons, resilience plays a crucial role in safeguarding against the development of clinical psychopathology. Resilience is gaining significance in various professional domains, including clinical psychology and medical sciences, due to a range of factors (Portzky et al., 2010). There are several resilience measurements that have been deemed satisfactory, such as the Brief Resilience Scale and the Connor Davidson Resilience Scale (CD-RISC), which have the potential to enhance research and practice across various professional domains. Therefore, it is imperative to conduct research on resilience and its associated factors.

Flourishing

The concept of flourishing is commonly used as an indicator of general life satisfaction and is considered to be a fundamental aspect of happiness (Fredrickson & Losada, 2013). Numerous features and concepts play a significant role in the overarching notion of flourishing and the advantages associated with a life that can be deemed to be flourishing (Huppert & So, 2013). Prominent scholars in the field of flourishing employ scientific methodologies to gain deeper insights into the concept of a fulfilling life. Their efforts broaden the horizons of psychological and social research by encompassing various dimensions such as well-being, happiness, citizenship, courage, and the gratification derived from healthy work and relationships. The results of the study indicate that individuals experience a heightened sense of purpose and fulfilment in their lives when they engage in various activities, establish meaningful relationships, and pursue gratifying objectives, such as overcoming adversity or engaging in community service (Keyes, 2010).

According to Keyes, flourishing is commonly understood as the state of leading a good life, characterised by experiencing positive emotions and functioning optimally (Huppert & So, 2013). The concept of flourishing is utilised by social scientists and psychologists as a means to examine and assess the levels of fulfilment, purpose, meaning, and happiness experienced by individuals. Numerous authors assert that the state of flourishing is attained when mentally healthy adults exhibit elevated levels of emotional well-being, along with manifestations of happiness and satisfaction. Individuals who experience flourishing commonly possess a certain level of control over their surroundings, possess a sense of purpose in life, embrace all aspects of their being, and demonstrate personal development and increased independence (Keyes & Haidt, 2003).

Mindfulness, Resilience, Well-being, and Academic Success

Recent studies have examined the relationship between mindfulness and well-being, specifically exploring how resilience may mediate the effects of mindfulness on life satisfaction and affect, which are indicators of subjective well-being. Bajaj, Gupta, and Pande (2016) demonstrated through the application of structural equation modelling (SEM) that resilience serves as a partial mediator in the associations between mindfulness, life satisfaction, and affect components. The results of the study provided evidence that resilience plays a significant role in the practice of mindfulness. This study aims to elucidate the potential mechanism underlying the relationship between mindfulness and subjective well-being. Specifically, previous studies have shown that there is a strong positive relationship between trait mindfulness and subjective well-being (Brown & Ryan, 2003; Schutte & Malouff, 2011; Wenzel et al., 2015). There is also empirical evidence supporting the notion that enhancing mindfulness through interventions, such as meditation training, contributes to the enhancement of individuals' overall well-being (Carmody & Baer, 2008; Geschwind et al., 2011).

In a similar vein, several research studies conducted on students at the college level have indicated that mindfulness has the potential to impact well-being by way of various mediators, including emotional intelligence, core self-evaluation, and self-esteem (Pepping, O'Donovan, & Davis, 2013; Schutte & Malouff, 2011). The current model

is deemed inadequate in its ability to effectively elucidate the positive impacts of mindfulness on overall well-being. This conclusion is drawn from the lack of empirical evidence supporting the notion that the identified mediators play a partial mediating role in this relationship. Nevertheless, it is anticipated that there may exist alternative mediators, such as resilience, that could elucidate the underlying mechanism linking mindfulness and subjective well-being. The present study aimed to examine the mediating role of resilience in the relationship between mindfulness and life satisfaction, as well as their collective influence on subjective well-being.

Therefore, drawing upon the existing body of literature, the present study posits the following primary research hypotheses: In a similar vein, several research studies conducted on students at the college level have indicated that mindfulness has the potential to impact well-being by way of various mediators, including emotional intelligence, core self-evaluation, and self-esteem (Pepping, O'Donovan, & Davis, 2013; Schutte & Malouff, 2011). The current model is deemed inadequate in its ability to effectively elucidate the positive impacts of mindfulness on overall well-being. This conclusion is drawn from the lack of empirical evidence supporting the notion that the identified mediators play a partial mediating role in this relationship.

Nevertheless, it is anticipated that there may exist alternative mediators, such as resilience, that could elucidate the underlying mechanism linking mindfulness and subjective well-being. The present study aimed to examine the mediating role of resilience in the relationship between mindfulness and life satisfaction, as well as their collective influence on subjective well-being. Therefore, drawing upon the existing body of literature, the present study posits the following primary research hypotheses:

H1: *Mindfulness has significant impact on resilience.*

H2: *Mindfulness has significant impact on well-being.*

H3: *Mindfulness has significant impact on academic success.*

H4: *Resilience has significant impact on academic success.*

H5: *Well-being has significant impact on academic success.*

H6: *Resilience significantly mediates between mindfulness and academic success.*

H7: *Well-being significantly mediates between mindfulness and academic success.*

H8: *Resilience significantly mediates between mindfulness and well-being.*

Research Methodology

The study methodology was delineated by the researchers, comprising two consecutive studies. The primary objective of the initial investigation was to assess the reliability and validity of two essential questionnaires: the Arabic adaptation of the Mindful Attention Awareness Scale and the Brief Resilience Scale. The validation procedure encompassed a cohort of college students from Egypt. Following the successful validation process, the second study employed the aforementioned validated questionnaires to gather data from a distinct cohort of Egyptian college students. The recruitment of participants was conducted in accordance with predefined inclusion criteria.

Subsequently, the participants were administered a set of validated questionnaires, supplemented by additional measures. The data obtained in the subsequent study facilitated an examination of the correlations among mindfulness, resilience, well-being, and academic achievement. The study employed various statistical techniques, including descriptive statistics, correlation analyses, and structural equation modelling, to investigate the potential mediating effects of resilience and well-being in the association between mindfulness and academic achievement. The utilisation of a dual-study methodology facilitated a thorough investigation of the research objectives and their ramifications within the specific cultural milieu of Arabic society. The subsequent two sections will delve into the discussion of the two studies.

Study 1

The study was used to validate the research instrument. For this purpose, study participants were aged between 17 and 23 years old (M = 19.87, SD = 2.96). Students (212 males, 274 females, total = 486) were randomly selected from the Faculty of Physical Education, Helwan University, Cairo, Egypt. The sample consisted of 212 male students and 274 female students. The development of a preliminary Arabic version for both the Mindfulness Attention Awareness (MAAS) and the Brief Resilience (BRS) scales involved the utilisation of the "forward and backward" translation technique (Vallerand & Hess, 2000).

The initial scales underwent a process of translation from the English language to Arabic, facilitated by the involvement of two translators proficient in both languages. Subsequently, the translated iterations were subjected to a process of back-translation into English, which involved the participation of two separate translators. In order to ensure comparability, the translators involved in the study were not associated with it. The Arabic versions of both scales were developed by the authors and subsequently reviewed by an independent expert. At this stage, the minor discrepancies observed in the two Arabic versions were rectified by identifying points of convergence between the two translations.

Measures

Mindfulness Attention Awareness Scale (MAAS)

The scale developed by Brown and Ryan (2003) consists of 15 items and is designed to assess the overall inclination towards acceptance and attention over a period of time. The participants provide ratings regarding the extent to which they operate in daily life without conscious awareness of their present experiences, encompassing cognitive, emotional, physical, and interpersonal aspects. Items are rated on a 6-point Likert scale (1 = almost always to 6 = almost never). Total scores range from 15 to 90, with higher scores reflecting greater mindfulness. Studies highlighted a high internal consistency (Cronbach's alpha: 0.82 - 0.87) and good test-retest reliability (Schmertz, Anderson, & Robins, 2009).

The Brief Resilience Scale (BRS)

The resilience scale utilised in the study conducted by Smith et al. (2008) consists of six items. The first, third, and fifth items exhibit positive wording, while the second, fourth, and sixth items demonstrate negative wording. The scoring of the scale involved the application of reverse coding to items 2, 4, and 6, followed by the computation of the mean score across all six items. The items in this study are evaluated using a 5-point Likert scale, where respondents indicate their level of agreement on a continuum ranging from "strongly disagree" (1) to "strongly agree"

(5). The findings of various studies have brought attention to a notable level of internal consistency (Cronbach's alpha: 0.80 to 0.91).

Procedure

The study authors obtained ethical approval prior to data collection, and each participant provided informed consent prior to completing the questionnaires. The data collection took place in September and November of 2022. The participants were provided with information regarding the objective of the study and were informed that their participation was voluntary. Participants were provided with instructions in both oral and written formats in Arabic to ensure their comprehension. It was emphasised that there were no correct or incorrect answers to the questions, and they were encouraged to express their thoughts freely. Additionally, participants were assured that their responses would be kept confidential.

Statistical analysis

The statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), with the exception of the Confirmatory Factor Analysis (CFA) which was performed using the Linear Structural Relations (LISREL) software. The data underwent a thorough examination to assess both univariate and multivariate normality. A regression imputation procedure was employed to substitute missing values, which accounted for 1% of the entire data file. The factor structure of the two scales was analysed by the CFA framework, which is considered a crucial aspect in establishing validation across various languages and cultures.

Initially, an assessment of internal consistency was conducted through the calculation of Cronbach's coefficients. Values greater than or equal to 0.70 were deemed acceptable. The confirmatory factor analysis (CFA) was conducted in order to examine the factor structure of the two scales. The objective of the study was to assess the degree of fit between the model and the observed data. The literature offers numerous recommendations regarding the quantity, nature, and threshold values for goodness-of-fit measures that should be disclosed when reporting confirmatory factor analysis (CFA) results (Byrne, 1998).

It is commonly advised to include three to four indices from diverse domains in the report. As a result, we introduce three indicators that assess the goodness-of-fit: the Goodness-of-Fit Index (GFI), the Non-Normed Fit Index (NNFI), and the Root Mean Square Error of Approximation (RMSEA). The suggested thresholds for acceptable values are equal to or greater than 0.90 ($\geq$ 0.90) for GFI and NNFI. The RMR and RMSEA evaluate the adequacy of the model's fit to the covariance matrix. Values that are less than 0.05 indicate a high level of conformity, while values that are less than 0.08 are considered to be within an acceptable range of conformity.

Results

The data were examined for normality, and no alarming trend was found. For the MAAS, univariate skewness (–1.02 to 0.42) and univariate kurtosis (1.66 to –0.84) indicated that the responses were relatively normally distributed. For BRS, univariate skewness (–1.18 to 0.27) and univariate kurtosis (1.89 to –0.48) indicated that the responses were relatively normally distributed. The reliability of the MASS was acceptable (Cronbach's alpha = 0.83), and the reliability of BRS was found satisfactory (Cronbach's alpha = 0.78). We tested the CFA for the Arabic version of both scales from the correlation matrix (Table1 and 2).

Table 1. The correlations between the 15 items of the MAAS

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	M	SD
1	-														5.00	1.45
2	.41*	-													5.10	1.40
3	.43*	.58*	-												4.83	1.51
4	.56*	.49*	.55*	-											5.17	1.40
5	.43*	.52*	.59*	.53*	-										4.82	1.49
6	.50*	.32*	.39*	.52*	.39*	-									4.74	1.62
7	.38*	.39*	.42*	.37*	.38*	.34*	-								5.30	1.38
8	.32*	.39*	.39*	.34*	.36*	.34*	.56*	-							5.22	1.32
9	.27*	.40*	.33*	.31*	.34*	.28*	.51*	.53*	-						5.36	1.30
10	.29*	.39*	.36*	.35*	.33*	.25*	.51*	.52*	.62*	-					5.26	1.30
11	.23*	.29*	.22*	.24*	.26*	.22*	.27*	.24*	.30*	.33*	-				4.70	1.73
12	.29*	.38*	.32*	.29*	.36*	.25*	.45*	.40*	.45*	.50*	.33*	-			5.00	1.44
13	.31*	.43*	.41*	.35*	.42*	.30*	.49*	.51*	.43*	.44*	.34*	.43*	-		5.11	1.41
14	.25*	.36*	.34*	.29*	.33*	.26*	.49*	.50*	.51*	.50*	.22*	.42*	.55*	-	5.04	1.45
15	.32*	.42*	.35*	.32*	.33*	.25*	.36*	.31*	.29*	.30*	.24*	.26*	.33*	.33*	4.73	1.55

Notes. n = 486, *p < .01

Table 2. The correlations between the six items of the BRS

Item	1	2	3	4	5	6	M	SD
1	-						4.40	1.72
2	.37*	-					4.27	1.64
3	.46*	.52*	-				4.74	1.59
4	.37*	.47*	.56*	-			5.02	1.60
5	.46*	.34*	.55*	.50*	-		5.34	1.28
6	.45*	.47*	.51*	.49*	.53*	-	4.31	1.76

Notes. n = 486; * p < .01

For MAAS, results of CFA showed a satisfactory fit to the data in terms of χ2, df ratio, GFI, NNFI, and RMSEA. The χ2 (731.37, N= 486) = 90, p = 0.001, NNFI = 0.97, CFI = 0.97, RMSEA = .04 [.03; .05], GFI = 0.96, AGFI = 0.95. The Goodness of Fit was acceptable regarding the χ2/df ratio, GFI, NNFI, RMR, and RMSEA.

Concerning the BRS, CFA showed a satisfactory fit to the data in terms of χ2, df ratio, GFI, NNFI, and RMSEA. The χ2 (25.27, N= 486) = 9, p = 0.001, NNFI = 0.98, CFI = 0.98, RMSEA = .01 [.02; .03], GFI = 0.98, AGFI = 0.97. The Goodness of Fit was acceptable regarding the χ2/df ratio, GFI, NNFI, RMR, and RMSEA.

Study 2

The second study aims to test a model that describes a mediator role of resilience and flourishing in the relationships between mindfulness (as an independent variable) and GPA score (as a dependent variable). For this purpose, study participants aged between 18 and 26 years old (M = 22.64, SD = 3.39). Students (197 males, 200 females; Total = 397) were randomly selected from the undergraduate and postgraduate (Master's degree) students of the Faculty of Physical Education, Helwan University, Cairo, Egypt.

Measures

In the second study, the Arabic versions of the Mindfulness Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) and the Brief Resilience Scale (BRS) (Smith et al., 2008), previously validated in the initial study, were employed.

Flourishing Scale (FS)

The 8-item summary measure developed by Diener et al. (2010) assesses an individual's self-perceived success in key domains, including relationships, self-esteem, purpose, and optimism. The psychological well-being scale demonstrates a singular score for assessing psychological well-being. Numerous studies conducted in various cultures have reported favourable psychometric properties and a strong internal consistency, as indicated by Cronbach's alpha coefficients ranging from .78 to .95 (Fassih-Ramandi et al., 2020; Hone, Jarden, & Schofield, 2014; Schotanus-Dijkstra et al., 2016; Silva & Caetano, 2013; Tong & Wang, 2017). The Arabic version utilised in the present study underwent translation and validation procedures conducted by Salama-Younes (2017).

Academic Success

The determination of academic success was achieved by calculating the average of the participants' module grades during the initial semester. The grading system referred to in this context is commonly known as GPA, which utilises a 100-point scale (M = 74.79, SD = 15.38).

Procedure

The data collection period spanned from February to March 2023. The study obtained ethics approval prior to data collection, and each participant provided informed consent prior to completing the questionnaires. The participants were provided with information regarding the purpose of the study and were informed of their right to withdraw from participation at any point. The participants were requested to complete the questionnaire distributed to them by the authors on a voluntary basis. The average time required for each respondent to complete the questionnaire was approximately 15 minutes.

Statistical analysis

The data underwent analysis using the statistical software packages SPSS and LISREL. The socio-demographic data were presented in terms of mean (M) and

standard deviation (SD) as measures of descriptive statistics. The study investigated two path analysis models:

Results

The present study revealed robust and statistically significant associations between mindfulness, resilience, flourishing, and GPA, as depicted in Table 3.

Table 3. The correlations among the study variables

Variable	Mindfulness	Resistance	Flourishing	GPA	M	SD
Mindfulness	-				4.96	1.00
Resistance	.37*	-			4.67	1.16
Flourishing	.53*	.43*	-		5.01	1.69
GPA	.55*	.49*	.51*	-	74.79	15.38

Notes. n = 397; * p < .01

The hypothesis proposed by Model 1 suggests that the relationship between mindfulness and flourishing is mediated by resilience. Furthermore, it is important to consider the role of flourishing in moderating the associations between resilience and grade point average (GPA). The correlation matrix serves as the underlying data source for conducting path analysis, while the estimation method employed in this study was maximum likelihood. The path analyses in the current research were executed as part of a SIMPLIS project. The existing model consisted of a single exogenous variable, namely mindfulness, and three endogenous variables, namely resilience, flourishing, and GPA. The sole dependent variable in both models is the GPA. The pathways were delineated in accordance with the aforementioned hypothesis.

Concerning model 1, the result of the path analysis showed a non-satisfactory fit to the data in terms of χ^2/df ratio, GFI, NNFI, RMR, and RMSEA. The χ^2 (6, N= 397), Non-Normed Fit Index NNFI = 0.76, CFI = 0.74, RMSEA = 0.24, GFI = 0.84, GFI = 0.84, RMR = 0.21. As shown in Figure 1, all estimated paths were significant at p= 0.05.
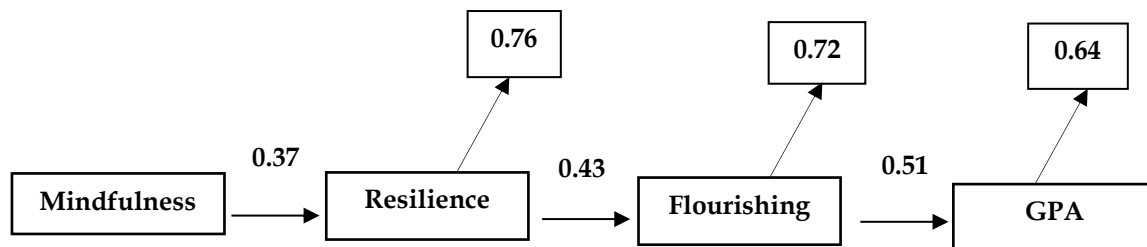
Figure 1. The present study aims to construct a path analysis model to examine the interrelationships between mindfulness, resilience, flourishing, and GPA. The standardised path coefficients are displayed. The study variables exhibit both direct and indirect effect paths of considerable significance. The current model does not exhibit an acceptable level of goodness of fit.
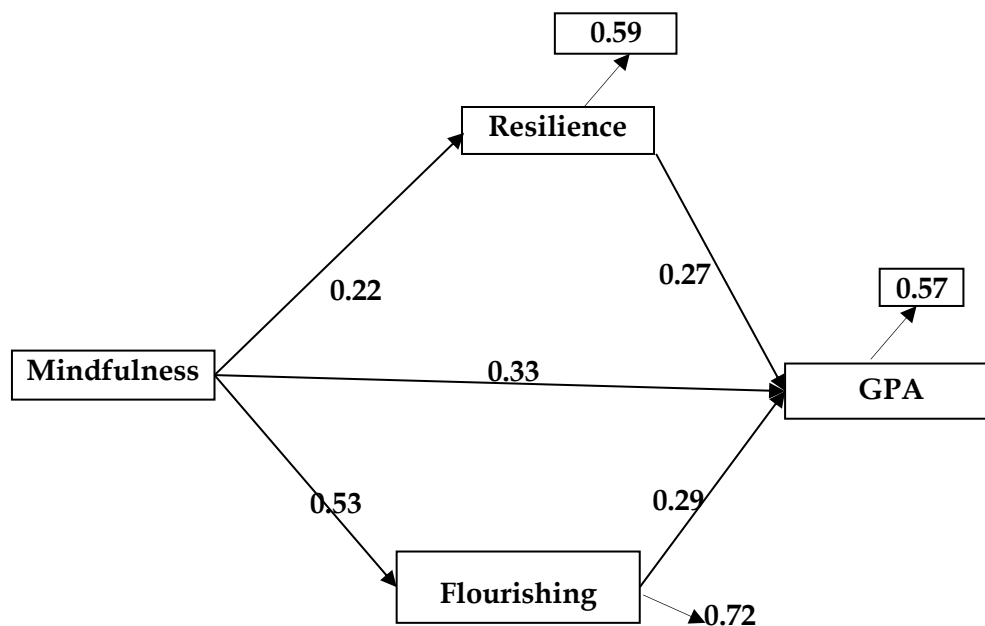

Figure 2. The second model of the path analysis. The model includes the presentation of standardised path coefficients. The study reveals notable direct and indirect pathways that demonstrate the connections between mindfulness, resilience, flourishing, and GPA. Nevertheless, the path coefficients reflect the values of the comprehensive mediating model, encompassing the direct effects of the independent variables on the outcome variables.

Regarding model 2, we tested a model proposed by the software to add a path from resilience to flourishing. The hypothesis stated that resilience and flourishing should mediate the relation between mindfulness and GPA. As shown in Figure 2, the model results are saturated, the fit is perfect, and all estimated paths are significant at p= 0.01.

Discussion and Conclusion

The initial aim of the present study was to examine the first objective, which involved assessing the one-dimensionality of the scales on a sample from Egypt. The findings of the study provided confirmation of the one-dimensionality of both scales in the Egyptian sample. There are similarities between the Multidimensional Assessment of Academic Self-Regulation (MAAS) results and those from other studies that used confirmatory factor analysis (CFA) (Carlson & Brown, 2005; Jermann et al., 2009; Osman et al., 2016; Soler et al., 2012). The results of the CFA align with the conclusions drawn in recent studies (Amat et al., 2014; Rodríguez-Rey, Alonso-Tapia, & Hernansaiz-Garrido, 2016; Smith et al., 2008). Soer et al. (2019) supporting the findings of the BRS. It has been determined that the Arabic versions of the two scales exhibit one-dimensionality and possess satisfactory reliability, similar to the original versions.

The correlation matrix in the second study revealed significant associations between mindfulness, resilience, flourishing, and GPA. The results indicate that the second model demonstrates a strong fit with the data, with resilience and flourishing serving as mediator variables. Moreover, it is worth noting that both resilience and flourishing serve as partial mediators in the association between mindfulness and GPA. In other words, partial mediation suggests that resilience and flourishing explain a portion, rather than the entirety, of the connection between mindfulness and GPA. Partial mediation is observed when there are significant associations among resilience, flourishing, and GPA, alongside a direct relationship between mindfulness and GPA. Therefore, the practice of mindfulness may potentially result in comparable levels of resilience, flourishing, and academic performance as measured by GPA scores.

The present findings bear resemblance to the outcomes of prior investigations. Drawing upon previous scholarly works (Bajaj & Pande, 2016; Meiklejohn et al., 2012; Thompson, Arnkoff, & Glass, 2011), it can be argued that mindfulness, when considered as a precursor to resilience, holds significant potential as a fundamental contributor to an individual's subjective well-being. There is substantial empirical support indicating that resilience plays a significant role in enhancing individuals' subjective well-being. Additionally, a positive correlation has been observed between mindfulness and elevated levels of well-being, as evidenced by studies conducted by Gu et al. (2015),

Baer et al. (2006). According to Hodgins and Knee (2002), mindfulness has the potential to enhance well-being by facilitating self-regulated behaviour and satisfying fundamental psychological needs such as autonomy (engaging in activities that are self-endorsed or freely chosen), competence, and relatedness.

Moreover, a substantial body of research has consistently demonstrated that individuals who exhibit flourishing characteristics are more likely to complete their college education, attain higher-quality employment opportunities, and experience greater success in their chosen careers (Bowman et al., 2010; Datu, 2018; Harwood & Froehlich, 2017; Howell, 2009; Wilson-Strydom & Walker, 2015). One contributing factor to this achievement is the empirical evidence suggesting a negative correlation between flourishing and work absenteeism (Lyubomirsky, King, & Diener, 2005).

Contributions and Recommendations

The study findings have made significant contributions from both theoretical and practical standpoints. The validation and development of the Mindful Attention Awareness Scale (MAAS) and the Brief Resilience Scale (BRS) in the Arabian context offer researchers and practitioners in Arabic-speaking settings reliable instruments to evaluate mindfulness and resilience. These constructs are of utmost importance in interventions aimed at promoting mental health and well-being. Furthermore, the second phase of the study emphasises the significance of mindfulness as a potential indicator of academic achievement, while resilience and flourishing serve as mediating factors.

These findings indicate that interventions targeted at cultivating mindfulness have the potential to indirectly enhance students' academic performance by strengthening their resilience and well-being. Theoretical implications pertain to the validation of the connections among mindfulness, resilience, flourishing, and academic achievement. The partial mediation model highlights the complex interaction between these constructs, enhancing our comprehension of how mindfulness can influence different aspects of individuals' lives, such as academic achievements. The research findings have provided valuable assistance to researchers and academics in conducting their studies, thereby facilitating the exploration of new avenues for future research.

While the investigation has addressed the study's secondary aim, it is important to acknowledge certain constraints that must be taken into account when interpreting the results. The second study exhibited a minimum of two noteworthy limitations: Initially, establishing the directionality of causality in relation to the proposed model is inherently unfeasible. There exists a reciprocal relationship between resilience and well-being, whereby resilience can lead to well-being, and conversely, well-being can also foster resilience.

Therefore, it is imperative for researchers to undertake efforts to replicate the current findings through the utilisation of experimental designs in order to establish the clear directionality of the effects. Additionally, we administered a questionnaire consisting of three scales immediately following the conclusion of the university semester for college students. However, this approach has limitations as it does not allow for an examination of the impact of engaging in sports activities. Prior research has indicated that individuals who are more physically active tend to report greater levels of enthusiasm and excitement compared to those who are less physically active (Bauman et al., 2012).

Moreover, engaging in one's preferred physical activity elicits intrinsic feelings of pleasure, happiness, and joy for certain individuals. These individuals experience a sense of self-satisfaction and well-being both during and after engaging in physical exercise, as they discover a preferred activity that aligns harmoniously with their personal way of life. This condition has the potential to contribute to enhanced academic achievement in tertiary education.

In conclusion, it is recommended that future research be conducted to explore the potential role of gender differences as a mediator variable. Mindfulness has the potential to influence an individual's physical and mental well-being, as well as their emotional state. A longitudinal research design would be appealing for investigating the constructs of mindfulness, resilience, flourishing, and academic success. Additionally, it is advisable to conduct further research on students who are associated with different colleges in order to investigate potential variations in the research variables attributable to the specific study area.

*Authors contributions:

All authors were involved in research design, implementation of the study, data gathering, data analysis, and writing of the manuscript. All authors approve submission of the manuscript for publication consideration. All authors read and approved the final manuscript.

*Availability of data and materials

We would have loved to share the data; however, the data is primary in nature and the authors do not wish to share the data as this may breach participant confidentiality.

*Competing interests

As authors, we declare that have no significant financial, professional or personal interests that may affect the performance or presentation of the work described in this manuscript. (The authors declare that they have no competing interests)

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