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# Does self-esteem mediate the association between perfectionism and mindfulness among Lebanese university students?

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## Abstract

**Objectives:** To evaluate the associations between mindfulness, self-esteem and perfectionism in a Lebanese sample of university students, as well as the indirect effect of self-esteem between mindfulness and perfectionism was investigated.

**Methods:** This cross-sectional study was carried out between July and September 2021. A total of 363 university students were recruited through convenience sampling through several universities in Lebanon's governorates. An online survey that included a part that collected sociodemographic information, the Freiburg Mindfulness Inventory to assess mindfulness, the Rosenberg Self-Esteem Scale to assess self-esteem and the Big Three Perfectionism Scale to assess perfectionism was completed by participants.

**Results:** Higher self-esteem ( $Beta = 1.30$ ) was significantly associated with more mindfulness, whereas higher self-critical perfectionism ( $Beta = -0.61$ ) was significantly associated with less mindfulness. Self-esteem mediated the association between self-critical and narcissistic perfectionism and mindfulness. More perfectionism was significantly and directly associated with less mindfulness and lower self-esteem, whereas higher self-esteem was significantly associated with more mindfulness.

**Conclusion:** This study provides valuable findings that enable practitioners to effectively identify people needing interventions to improve psychological health through mindfulness, self-esteem and perfectionism. The conclusions that can be deduced from this study can help educational psychologists and counselors guide university students towards effective mindfulness practices that can increase self-esteem levels and balance maladaptive perfectionism that can cause distress and impairment in the social and academic settings.

**Keyword:** Mindfulness, Perfectionism, Self-esteem, Lebanon, University students

## Background

Mindfulness is a concept that has been increasing in popularity over the last few years [1], and yet, defining it can cause some confusion to arise. From a philosophical perspective, mindfulness consists of knowing, shaping and consequently freeing the mind [2]. This tradition of wisdom is native in some Asian countries such as India, China and Japan, and has recently spread into Western societies [2]. In essence, mindfulness can be defined as an integration of attention and awareness to experience

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the present moment [3]. The practice of mindfulness has expanded to the field of psychology, where mindfulness-based interventions (MBIs) have been integrated and shown improvements in psychological issues such as anxiety, insomnia and stress [4]. In fact, research has shown that mindfulness has become a widely popular psychological technique to increase wellbeing, autonomy and discipline [5].

The effect of mindfulness-based interventions has extended to other psychological variables, including self-esteem. A multitude of studies has found a positive association between MBIs and self-esteem, where adopting mindfulness has significantly increased self-esteem [6]. Additionally, mindfulness training improved positive self-esteem and predicted it in another study [7]. This was evident in a sample of university students, where practicing mindfulness produced improvements in both self-esteem and growth mindset in the educational and social settings [8]. In addition, the practice of mindfulness has contributed to the stability of self-esteem over time [9]. Self-esteem also influenced mindfulness, as it mediated its relationship with happiness among university students [10]. Similarly, self-esteem mediated the association between mindfulness and psychological wellbeing [11]. Previous literature suggests that self-esteem has an indirect effect on mindfulness, such as the case in another recent study where self-esteem was a pathway for a positive relationship between mindfulness and life satisfaction [12].

Apart from self-esteem, mindfulness in combination with adaptive perfectionism was found to have positive effects on both physical and psychological wellbeing [13]. However, perfectionism is not always adaptive or beneficial psychologically. In fact, mindfulness-based therapy was used in hand with cognitive therapy to cope with distress related to perfectionism [14]. The use of such mindfulness practices was helpful for a sample of university students in dealing with impairment due to perfectionism [14]. The lack of mindfulness practices was associated with maladaptive perfectionism that negatively influenced the ability to deal with life's difficulties [15]. Similarly, university students who encounter increased pressure to be perfect were found to benefit from practicing mindfulness in recent studies [16]. Here, it is important to differentiate between the three perfectionism dimensions that are discussed in the present study. To assess perfectionism, the Big Three Perfectionism Scale was adopted, with three factors: rigid perfectionism, which consists of insisting on having flawless, perfect and error-free performance, a strong necessity to be perfect and flawless [17]; self-critical perfectionism, which is characterized by scrutinizing one's mistakes, self-doubt and self-criticism, worry about having

imperfect performance and experiencing distress if performance is perceived as error-prone [17]; and narcissistic perfectionism, which is directed towards others through grandiose behavior, entitlement and over-criticism of others, demanding others to be perfect and experiencing feelings of distress if others' performance is perceived as imperfect [17, 18]. Given that rigid and self-critical perfectionism are directed towards the self, it has been noted to have the most prominent maladaptive qualities [19], as opposed to narcissistic perfectionism. Generally, maladaptive perfectionism is associated with lower self-esteem [20]. In another study, adaptive perfectionism that represented personal striving was related to higher self-esteem while self-esteem associated with criticism was related to lower self-esteem [21]. Another study found a negative relationship between self-esteem and maladaptive perfectionism among students [22].

In a study that included a Lebanese sample of university students, results showed that people with higher self-esteem and lower perfectionism scores were less likely to exhibit maladaptive behavior such as justifying failure and internalizing invalid success [23]. Another study in Lebanon showed that self-compassion, which can be considered an antonym to maladaptive perfectionism, and mindfulness were positively and significantly associated with each other in a sample of middle school students [24]. As previously mentioned, rigid and self-critical perfectionism involve stressful mechanisms that pressure the self, and negative perfectionism is related to lower mindfulness. These supported assumptions can be backed-up by a study involving Lebanese adolescents, where stress was more likely to be lower if mindfulness is practiced [25]. Furthermore, self-esteem mediated the relationship between mindfulness and other psychological variables in multiple studies. In a sample of Chinese university students, self-esteem mediated the association between mindfulness and social anxiety [26]. Perfectionism is connected to social anxiety in a core element: criticism and the individual believing that he/she is not meeting certain expectations [27]. Similarly, self-esteem was a full mediator in the association between mindfulness and psychological wellbeing [28].

Through research, it can be inferred that the studies investigating mindfulness, self-esteem and perfectionism are scarce, rather non-existent for the Lebanese population. The topic of mindfulness has not been scientifically explored within Lebanon yet. It is an understatement to say that the devastating economic and social tragedies that have been occurring in Lebanon affect the state of university students. Furthermore, previous studies have explored the relationships involved with self-esteem such as stress [29] and depression [30] among university students. However, none investigated the associations

between self-esteem, mindfulness and perfectionism within university students, to the best of our knowledge.

A previous study found that about 75% of Lebanese university students developed acute stress [31]. Meanwhile, mindfulness was a significant influencer on bettering university students' psychological health [32]. Therefore, examining mindfulness and its associated psychological variables among university students is most valuable and beneficial for interventions at a time that can be described as the worst period in modern Lebanese history. Hence, in this study, the aim was to evaluate the associations between mindfulness, self-esteem and perfectionism in a Lebanese sample of university students. Additionally, the indirect effect of self-esteem between mindfulness and perfectionism was investigated. The current study is directed towards healthcare professionals and scientists, especially those who work with university students, a population that faces academic, social and country-related pressures, in order to provide more information about the variables at hand and guide action.

## Methods

### Study design and participants

This cross-sectional study was carried out between July and September 2021. A total of 363 university students were recruited through convenience sampling through several universities in Lebanon's governorates. Participants received the online link to the survey. Involved people were encouraged to visit a website that would guide them to the consent form, information form (purpose of the current study, anonymity, voluntariness of consent to research), and questionnaire. All participants responded willingly to the survey. There were no fees for participating in the study. All university students over the age of 18 were eligible to participate. Excluded were those who refused to complete the survey [33, 34].

### Minimal sample size calculation

According to the G-power, a minimum of 316 students was deemed necessary to have enough statistical power, based on a 5% risk of error, 80% power,  $f^2 = 2.5\%$  and 10 factors to be entered in the multivariable analysis.

### Questionnaire and variables

The Arabic self-administered questionnaire with closed-ended questions was anonymous; the questionnaire required approximately 20 min to be completed. The questionnaire consisted of different sections. The first part clarified socio-demographic characteristics: age, gender, marital status, and household crowding index. The latter, reflecting the socioeconomic status of the family, was calculated by dividing the number of persons in the house by the number of rooms in the house excluding

the bathrooms and kitchen [35]. The physical activity index was calculated by multiplying the intensity by the frequency by the time of physical activity [36].

The second part of the questionnaire included the following scales:

### Freiburg mindfulness inventory (FMI)

Freiburg Mindfulness Inventory (FMI) is composed of 14 items describing all aspects of mindfulness [37]. This instrument is used to characterize the person's experience of mindfulness. Each item is scored based on a 4-point Likert scale with 1=rarely and 4=always. Higher total score means more mindfulness. This scale is validated in Lebanon [38]. The Cronbach's alpha in this study was 0.92.

### Rosenberg self-esteem scale (RSES)

It is a 10-item scale that reflects self-worth by focusing on both positive and negative feelings people have about themselves [39]. Items are scored on a four-point Likert scale (1 = strongly disagree to 4 = strongly agree). Higher scores reflect a better self-esteem. The Arabic version has been used in previous papers [40, 41]. The Cronbach's alpha in this study was 0.99.

### Big three perfectionism scale

This scale is composed of 16 items, scored on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) [18]. It yields three subscales scores: rigid perfectionism, self-critical perfectionism and narcissistic perfectionism. Higher scores reflect higher perfectionism in the three aspects. In this study, the Cronbach's alpha values for the three scores were as follows: rigid perfectionism ( $\alpha = 0.87$ ), self-critical perfectionism ( $\alpha = 0.88$ ) and narcissistic perfectionism ( $\alpha = 0.81$ ).

### Statistical analysis

SPSS software version 25 was used to conduct data analysis. The normality of the mindfulness, self-esteem and perfectionism subscales scores were verified via the skewness and kurtosis values varying between  $-1$  and  $+1$  [42]. A bivariate analysis using the Pearson correlation test served to assess the relationship between the mindfulness score and other continuous variables, whereas the Student t test was used to compare two means. A linear regression was conducted taking mindfulness as the dependent variable. The PROCESS SPSS Macro v. 3.4, Model 4 [43] was used to conduct the mediation analysis; three pathways were calculated: (a) Relation between perfectionism and SE; (b) Relation between SE and mindfulness; (c') Direct effect of the relation between perfectionism and mindfulness. Pathway AB determined the indirect effect; the latter was considered significant if the

**Table 1** Sociodemographic and other characteristics of the participants ( $N=363$ )

Variable	<i>N</i> (%)
Sex	
Male	139 (38.3%)
Female	224 (61.7%)
Marital status	
Single	343 (94.5%)
Married	20 (5.5%)
	<b>Mean <math>\pm</math> SD</b>
Age (in years)	22.65 $\pm$ 3.48
Physical activity index	27.94 $\pm$ 20.44
Household crowding index	1.01 $\pm$ 0.53
Self-esteem	16.14 $\pm$ 2.09
Rigid perfectionism	12.61 $\pm$ 3.80
Self-critical perfectionism	17.60 $\pm$ 5.63
Narcissistic perfectionism	14.29 $\pm$ 4.76
Mindfulness	24.32 $\pm$ 8.56

**Table 2** Bivariate analysis of the categorical variables associated with mindfulness

Variable	Mindfulness	
	Mean $\pm$ SD	<i>p</i>
Sex		0.390
Male	24.81 $\pm$ 8.09	
Female	24.02 $\pm$ 8.84	
Marital status		<b>0.001</b>
Single	23.98 $\pm$ 8.53	
Married	30.20 $\pm$ 6.97	

Numbers in bold indicate significant *p*-values

confidence interval did not pass by zero. The mediation analysis and linear regression results were adjusted over all variables that showed a  $p < 0.25$  in the bivariate analysis for the elimination of confounding factors as much as possible. Significance was defined at  $p < 0.05$ .

## Results

### Sociodemographic and other characteristics of the participants

The mean age of the participants was 22.65  $\pm$  3.48 years, with 61.7% females. Other characteristics are summarized in Table 1.

### Bivariate analysis

A higher mean mindfulness score was found in married participants compared to single ones (30.20 vs. 23.98;

**Table 3** Correlation of continuous variables with mindfulness

Variable	Mindfulness	
	<i>r</i>	<i>p</i>
Age	0.15	<b>0.004</b>
Physical activity index	0.03	0.539
Household crowding index	-0.08	0.126
Rigid perfectionism	-0.15	<b>0.006</b>
Self-critical perfectionism	-0.45	<b>&lt;0.001</b>
Narcissistic perfectionism	-0.19	<b>&lt;0.001</b>
Self-esteem	0.43	<b>&lt;0.001</b>

Numbers in bold indicate significant *p*-values; *r* = Pearson correlation coefficient

$p = 0.001$ ) (Table 2). Older age ( $r = 0.15$ ), and higher self-esteem ( $r = 0.43$ ) were significantly associated with more mindfulness, whereas higher rigid ( $r = -0.15$ ), self-critical ( $r = -0.45$ ) and narcissistic ( $r = -0.19$ ) perfectionism were significantly associated with less mindfulness (Table 3).

### Multivariable analysis

A linear regression taking mindfulness as the dependent variable, showed that higher self-esteem (Beta = 1.30) was significantly associated with more mindfulness, whereas higher self-critical perfectionism (Beta = -0.61) was significantly associated with less mindfulness (Table 4).

### Mediation analysis

The results of the mediation analysis showed that self-esteem mediated the association between self-critical and narcissistic perfectionism and mindfulness (Table 5). More perfectionism was significantly and directly associated with less mindfulness and lower self-esteem, whereas higher self-esteem was significantly associated with more mindfulness (Figs. 1 and 2).

## Discussion

### Mindfulness, self-esteem and perfectionism

Higher self-esteem was significantly associated with more mindfulness. An older study showed that individuals with higher and stable self-esteem levels were more likely to practice mindfulness [44]. Another investigation showed that enhancing self-esteem amplified the positive effects of mindfulness, which subsequently reflected positively on other behavioral problems [45]. Having said that, the majority of studies evaluating the relationship between self-esteem and mindfulness examine the effect of mindfulness on self-esteem, or determine the presence of a significant correlation. For example, a recent study that involved an Indian sample of adults, where

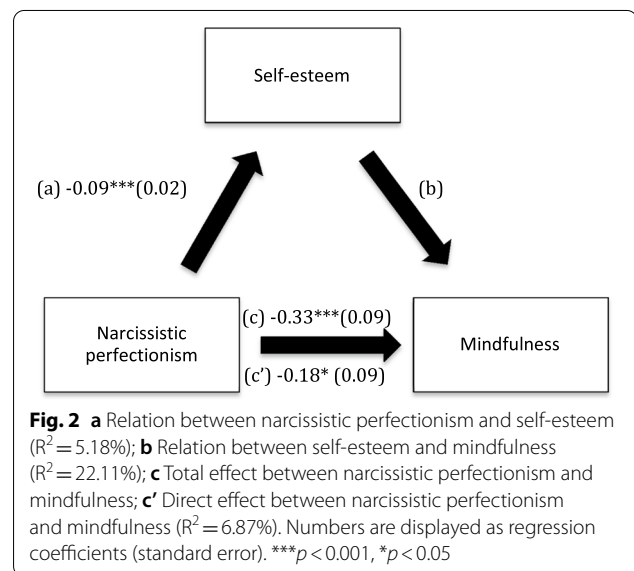
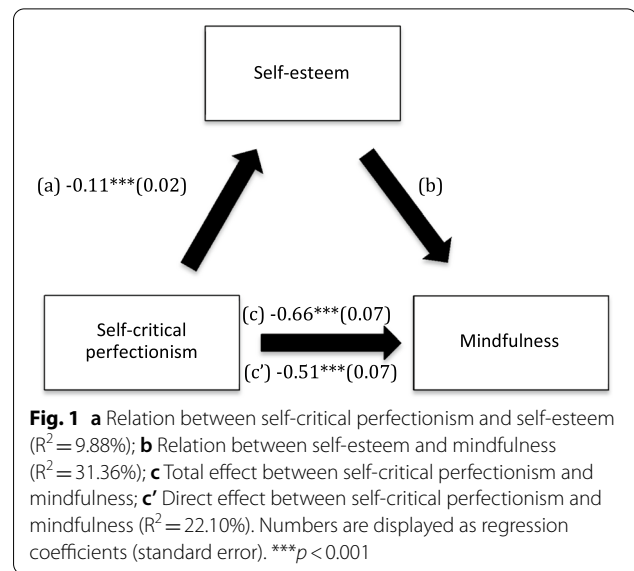
**Table 4** Multivariable analysis: Linear regression (using the ENTER method) taking mindfulness as the dependent variable (Nagelkerke R<sup>2</sup> = 31.9%)

	Beta	β	p	95% CI
Marital status (married vs. single*)	1.93	0.05	0.345	- 2.08; 5.93
Age	0.21	0.09	0.110	- 0.05; 0.48
Household crowding index	- 0.17	- 0.01	0.810	- 1.59; 1.24
Self-esteem	1.30	0.32	<b>&lt; 0.001</b>	0.92; 1.68
Rigid perfectionism	0.12	0.05	0.332	- 0.12; 0.37
Self-critical perfectionism	- 0.61	- 0.40	<b>&lt; 0.001</b>	- 0.78; - 0.43
Narcissistic perfectionism	0.11	0.06	0.274	- 0.08; 0.30

\*Reference group; Beta = unstandardized beta; β = standardized beta; CI = Confidence interval; numbers in bold indicate significant p-values

mindfulness techniques reflected positively on the level of self-esteem [46]. Another study hypothesized that mindfulness contributes to better psychological wellbeing, which increases the probability of having a higher self-esteem [47]. Similar results were shown in a sample of university students as mindfulness practices significantly increased the level of self-esteem, even when the mindfulness practice was brief [7]. Also, mindfulness was able to buffer the adverse effects of low self-esteem among a sample of university students [48]. These results combined can indicate the positive correlation between self-esteem and mindfulness, further implying that higher self-esteem and higher mindfulness are related.

Higher self-critical perfectionism was significantly associated with less mindfulness. Research has shown that individuals with high self-critical perfectionism experience more distress and hassles in comparison with other university students [49]. Practicing mindfulness and distress have an inverse relationship: higher mindfulness is associated with lower distress [50]. Therefore, it might be inferred that the negative association between self-critical perfectionism and mindfulness is rational. In a recent study, self-critical perfectionism not only was associated with less mindfulness, but also predicted higher distress within the next two years [51].



**Table 5** Mediation analyses results, taking perfectionism as the independent variable, self-esteem as the mediator and mindfulness as the dependent variable

	Direct effect			Indirect effect		
	Beta	SE	P	Beta	Boot SE	Boot CI
Rigid perfectionism	- 0.29	0.11	0.006	- 0.04	0.05	- 0.15; 0.06
Self-critical perfectionism	- 0.51	0.07	< 0.001	- 0.15	0.03	- 0.21; - 0.09*
Narcissistic perfectionism	- 0.18	0.09	0.036	- 0.15	0.04	- 0.23; - 0.07*

\* indicates significant mediation

Mindfulness is more likely to reduce self-critique and judgmental attitudes towards the self [47].

More perfectionism was significantly and directly associated with less mindfulness and lower self-esteem, whereas higher self-esteem was significantly associated with more mindfulness. An older study set the foundation for these findings: people who had perfectionist self-standards and met the criteria for perfectionism in a study had lower self-esteem [52]. Later, it was found that individuals exhibiting higher maladaptive perfectionism were more likely to have lower self-esteem [20]. These results were supported by another study that showed a significant association between perfectionism and decreased levels of self-esteem among university students [53]. In a previous study, a negative correlation was found between perfectionism and psychological wellbeing while a positive relationship was found between self-esteem and psychological wellbeing [54]. As for the association between perfectionism and mindfulness, a study showed that perfectionism is significantly related to low mindfulness [16]. This relationship can be supported by a recent study where higher perfectionism levels were associated with lower mindfulness [55]. Given these points discussed above, it can be hypothesized that individuals with high perfectionism levels are more likely to have low self-esteem and subsequently less likely to practice mindfulness.

#### **Self-esteem mediation between mindfulness and perfectionism**

Self-esteem mediated the association between self-critical and narcissistic perfectionism, and mindfulness. Previous studies have shown that self-esteem mediated the relationship between perfectionism and other psychological variables such as self-efficacy [56]. Another study showed that self-esteem mediated the association between maladaptive perfectionism and depression among a sample of university students [57]. Results also indicated that self-esteem was a full mediator between mindfulness and psychological wellbeing for a sample of undergraduate university students [28]. Additionally, self-esteem mediated the connection between self-critical perfectionism and depressive symptoms [58]. It can be observed from the results stated that no studies have investigated the mediation role of self-esteem on the relationship between perfectionism and mindfulness. It is important to note that past investigation found that both self-critical and narcissistic perfectionism dimensions are associated with lower self-esteem among university students [53]. In addition, self-critical perfectionism is related to lower mindfulness [51] while there is a lack of studies on the association between mindfulness and narcissistic perfectionism. It can be hypothesized that higher mindfulness increases the probability of having higher

self-esteem, which in turn affects the manifestation of perfectionism in either the self-critical or narcissistic dimension.

#### **Mindfulness practices, self-esteem and perfectionism**

Multiple studies have aimed to investigate the efficacy of mindfulness practices on mental health variables. Mindfulness-based cognitive therapy (MBCT) is a practice used to raise mindfulness, aid in perceiving experiences in a neutral way and avoid negative thought processes [59]. Research indicates that attending MBCT effectively improved self-esteem levels in a previous study [60]. Other analyses showed that MBCT aids in improving multiple psychological variables and prevents the recurrence of psychiatric disorders [61]. Additionally, MBCT was found to significantly decrease levels of perfectionism in an intervention program lasting 8 weeks [14]. Another experiment also showed a significant improvement on self-esteem measures following MBCT training sessions [62]. These findings further highlight the importance of the associations that were established in our study.

#### **Clinical implications**

The results of the current study highlight the importance of mindfulness and its practices on improving psychological variables such as self-esteem and perfectionism. These findings are especially important as the study was conducted on university students, a sample that is under substantial pressure to perform socially and academically. The conclusions that can be deduced from this study can help educational psychologists and counselors guide university students towards effective mindfulness practices that can increase self-esteem levels and balance maladaptive perfectionism that can cause distress and impairment in the social and academic settings.

#### **Limitations**

First, the study was executed on a sample of university students, which means that the results cannot be generalized to the entire Lebanese population. Second, the analyses conducted reflect correlational relationships between the variables discussed and therefore do not infer causation. For future research, it is recommended to replicate this study longitudinally. Third, self-report measures were used to assess the different study variables, which could be subject to social desirability bias. Fourth, not all scales used in this research have been validated in Lebanon yet (i.e. The Big three perfectionism scale). Additionally, other factors (year of study, major, type of university, type of faculty), which might be related to mental health, have not been assessed in the questionnaire, predisposing us to a confounding bias.

## Conclusion

This study provides valuable findings that enable practitioners to effectively identify people needing interventions to improve psychological health through mindfulness, self-esteem and perfectionism. The current results are novel within the Lebanese context and add new information to a gap in the existing body of literature about self-esteem, mindfulness and perfectionism. Having established significant associations between the variables at hand, future studies are needed to explore specific mindfulness practices that are most strongly in relation to self-esteem and the different dimensions of perfectionism. This could help in the employment of specific mindfulness practices towards the benefit of people's psychological health. Furthermore, longitudinal studies are needed to determine the longevity of the effect of mindfulness in its different practices on the Lebanese population, as mindfulness practices could submit to cultural variations.

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## Author contributions

SO and SH designed the study; EA drafted the manuscript; SH carried out the analysis and interpreted the results; all authors reviewed the final manuscript and gave their consent.

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## Availability of data and materials

All data generated or analyzed during this study are not publicly available due to the restrictions from the ethics committee. Any request about the data can be sent to the corresponding author (SH).

## Declarations

### Ethics approval and consent to participate

The Psychiatric Hospital of the Cross Ethics and Research Committee approved this study protocol (HPC-007–2021). A written informed consent was considered obtained from each participant when submitting the online form. All methods were performed in accordance with the relevant guidelines and regulations.

### Consent for publication

Not applicable.

### Competing interests

The authors have nothing to disclose.

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## References

- Shapiro SL, Carlson LE, Astin JA, Freedman B. Mechanisms of mindfulness. *J Clin Psychol.* 2006;62(3):373–86.
- Kabat-Zinn J. Mindfulness. *Mindfulness.* 2015;6(6):1481–3.
- Black DS. A brief definition of mindfulness. *Behav Neurosci.* 2011;7(2):109.
- Shapiro S, Weisbaum E. History of mindfulness and psychology. In: *Oxford Research Encyclopedia of Psychology*; 2020.
- Arthington P. Mindfulness: a critical perspective. *Commun Psychol Global Perspect.* 2016;2(1):87–104.
- Randal C, Pratt D, Bucci S. Mindfulness and self-esteem: a systematic review. *Mindfulness.* 2015;6(6):1366–78.
- Pepping CA, O'Donovan A, Davis PJ. The positive effects of mindfulness on self-esteem. *J Posit Psychol.* 2013;8(5):376–86.
- Saraff S, Tiwari A. Effect of mindfulness on self-concept, self-esteem and growth mindset: evidence from undergraduate students. *J Psychosoc Res.* 2020. <https://doi.org/10.32381/JPR.2020.15.01.28>.
- Ford CG. An investigation of the relation between mindfulness and self-esteem stability: West Virginia University; 2019.
- Bajaj B, Gupta R, Sengupta S. Emotional stability and self-esteem as mediators between mindfulness and happiness. *J Happiness Stud.* 2019;20(7):2211–26.
- Ayesha T, Akbar W, Shai S. Mediating role of emotional stability and self-esteem between mindfulness and psychological wellbeing. *Int J Psychosoc Rehabil.* 2020;24(1):5161–74.
- Lee J, Weiss A, Ford CG, Conyers D, Shook NJ. The indirect effect of trait mindfulness on life satisfaction through self-esteem and perceived stress. *Curr Psychol.* 2022; 1–13.
- Perolini CM. Mindfulness and perfectionism as predictors of physical and psychological well-being in college students; 2012.
- James K, Rimes KA. Mindfulness-based cognitive therapy versus pure cognitive behavioural self-help for perfectionism: a pilot randomised study. *Mindfulness.* 2018;9(3):801–14.
- Hinterman C, Burns L, Hopwood D, Rogers W. Mindfulness: Seeking a more perfect approach to coping with life's challenges. *Mindfulness.* 2012;3(4):275–81.
- Flett GL, Nepon T, Hewitt PL, Rose AL. Why perfectionism is antithetical to mindfulness: a conceptual and empirical analysis and consideration of treatment implications. *Int J Ment Heal Addict.* 2021;19(5):1625–45.
- Svicher A, Gori A, Di Fabio A. The big three perfectionism scale-short form: an item response theory analysis of Italian workers. *Front Psychol.* 2022. <https://doi.org/10.3389/fpsyg.2022.971226>.
- Smith MM, Saklofske DH, Stoeber J, Sherry SB. The big three perfectionism scale: a new measure of perfectionism. *J Psychoeduc Assess.* 2016;34(7):670–87.
- Kokkoris MD. New insights into the association of maximizing with facets of perfectionism. *Personal Individ Differ.* 2019;142:100–2.
- Ashby JS, Rice KG. Perfectionism, dysfunctional attitudes, and self-esteem: a structural equations analysis. *J Couns Dev.* 2002;80(2):197–203.
- Taylor JJ, Papay KA, Webb JB, Reeve CL. The good, the bad, and the interactive: evaluative concerns perfectionism moderates the effect of personal strivings perfectionism on self-esteem. *Personal Individ Differ.* 2016;95:1–5.
- LEANA-TAŞÇILAR MZ, Kanli E. Investigation of perfectionism and self-esteem scores of gifted and average students. *Ank Univ J Fac Educ Sci JFES.* 2014; 47(2):1–20.
- Pulford BD, Johnson A, Awaida M. A cross-cultural study of predictors of self-handicapping in university students. *Personal Individ Differ.* 2005;39(4):727–37.
- Akiki R, Dahdouli N, Dimassi O. Mindfulness, self-compassion and resilience among fifth graders at al makassed dawha school in Lebanon; 2021.
- Stephan NL. Facets of dispositional mindfulness and perceived stress in Lebanese adolescents; 2019.
- Tan J, Lo P, Ge N, Chu C. Self-esteem mediates the relationship between mindfulness and social anxiety among Chinese undergraduate students. *Soc Behav Personal Int J.* 2016;44(8):1297–304.
- Frost RO, Glossner K, Maxner S. Social anxiety disorder and its relationship to perfectionism. *Soc Anxiety.* 2010; 119–145.
- Bajaj B, Gupta R, Pande N. Self-esteem mediates the relationship between mindfulness and well-being. *Personal Individ Differ.* 2016;94:96–100.
- Liu X, Cao X, Gao W. Does low self-esteem predict anxiety among Chinese college students? *Psychol Res Behav Manag.* 2022;15:1481.
- Gao W, Luo Y, Cao X, Liu X. Gender differences in the relationship between self-esteem and depression among college students: a cross-lagged study from China. *J Res Pers.* 2022;97:104202.

31. Kassir G, El Hayek S, Zalzale H, Orsolini L, Bizri M. Psychological distress experienced by self-quarantined undergraduate university students in Lebanon during the COVID-19 outbreak. *Int J Psychiatry Clin Pract*. 2021;25(2):172–9.
32. Gallego J, Aguilar-Parra JM, Cangas AJ, Langer Á, Mañas I. Effect of a mindfulness program on stress, anxiety and depression in university students. *Span J Psychol*. 2014; 17.
33. Rogoza R, Mhanna M, Gerges S, Donini LM, Obeid S, Hallit S. Validation of the Arabic version of the ORTO-R among a sample of Lebanese young adults. *Eat Weight Disord*. 2022;27(6):2073–80. <https://doi.org/10.1007/s40519-021-01350-x>.
34. Awad E, Rogoza R, Gerges S, Obeid S, Hallit S. Association of social media use disorder and orthorexia nervosa among lebanese university students: the indirect effect of loneliness and factor structure of the social media use disorder short form and the jong-gierveld loneliness scales. *Psychol Rep*. 2022. <https://doi.org/10.1177/00332941221132985>.
35. Melki I, Beydoun H, Khogali M, Tamim H, Yunis K. Household crowding index: a correlate of socioeconomic status and inter-pregnancy spacing in an urban setting. *J Epidemiol Commun Health*. 2004;58(6):476–80.
36. Weary-Smith KA. Validation of the physical activity index (PAI) as a measure of total activity load and total kilocalorie expenditure during submaximal treadmill walking. University of Pittsburgh; 2007.
37. Walach H, Buchheld N, Buttenmüller V, Kleinknecht N, Schmidt S. Measuring mindfulness—the Freiburg mindfulness inventory (FMI). *Personal Individ Differ*. 2006;40(8):1543–55.
38. Hallit S, Bitar Z, Rogoza R, Obeid S. Validation of the arabic version of the freiburg mindfulness inventory (FMI-Ar) among a sample of lebanese university students; 2022.
39. Rosenberg M. Rosenberg self-esteem scale (RSE). *Accept Commit Ther Meas Package*. 1965;61(52):18.
40. Bitar Z, Hallit S, Khansa W, Obeid S. Phubbing and temperaments among young Lebanese adults: the mediating effect of self-esteem and emotional intelligence. *BMC Psychol*. 2021;9(1):1–9.
41. Zeidan J, Hallit S, Akel M, Louragli I, Obeid S. Problematic smartphone use and affective temperaments among Lebanese young adults: scale validation and mediating role of self-esteem. *BMC Psychol*. 2021;9(1):1–11.
42. Leguina A. A primer on partial least squares structural equation modeling (PLS-SEM). In.: Taylor & Francis; 2015.
43. Hayes AF. Introduction to mediation, moderation, and conditional process analysis: a regression-based approach: Guilford publications; 2017.
44. Heppner WL, Kernis MH. “Quiet ego” functioning: the complementary roles of mindfulness, authenticity, and secure high self-esteem. *Psychol Inq*. 2007;18(4):248–51.
45. Dhandra TK. Does self-esteem matter? A framework depicting role of self-esteem between dispositional mindfulness and impulsive buying. *J Retail Consum Serv*. 2020;55:102135.
46. Chandna S, Sharma P, Moosath H. The mindful self: exploring mindfulness in relation with self-esteem and self-efficacy in Indian population. *Psychol Stud*. 2022;67(2):261–72.
47. Asli Azad M, Shariat S, Farhadi T, Shahidi L. The prediction of psychological well-being based on self-compassion and self-esteem in caregivers of people with physical, mental, and multiple disabilities in the welfare organization. *J Soc Behav Commun Health*. 2018;2(1):164–73.
48. Michalak J, Teismann T, Heidenreich T, Ströhle G, Vocks S. Buffering low self-esteem: the effect of mindful acceptance on the relationship between self-esteem and depression. *Personal Individ Differ*. 2011;50(5):751–4.
49. Dunkley DM, Blankstein KR. Self-critical perfectionism, coping, hassles, and current distress: a structural equation modeling approach. *Cogn Ther Res*. 2000;24(6):713–30.
50. Coffey KA, Hartman M. Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complement Health Pract Rev*. 2008;13(2):79–91.
51. Tobin R, Dunkley DM. Self-critical perfectionism and lower mindfulness and self-compassion predict anxious and depressive symptoms over two years. *Behav Res Ther*. 2021;136:103780.
52. Flett GL, Hewitt PL, Blankstein K, O'Brien S. Perfectionism and learned resourcefulness in depression and self-esteem. *Personal Individ Differ*. 1991;12(1):61–8.
53. Dunkley DM, Berg JL, Zuroff DC. The role of perfectionism in daily self-esteem, attachment, and negative affect. *J Pers*. 2012;80(3):633–63.
54. Karatas Z, Tagay O. Self esteem, locus of control and multidimensional perfectionism as the predictors of subjective well being. *Int Educ Stud*. 2012;5(6):131–7.
55. Gharibi H, Besharat MA, Mansouri J. Predicting Mindfulness levels based on self-oriented, other-oriented, and socially prescribed perfectionism dimensions. *J Appl Psychol Res*. 2021;12(1):167–81.
56. Deuling JK, Burns L. Perfectionism and work-family conflict: Self-esteem and self-efficacy as mediator. *Personal Individ Differ*. 2017;116:326–30.
57. Chai L, Yang W, Zhang J, Chen S, Hennessy DA, Liu Y. Relationship between perfectionism and depression among Chinese college students with self-esteem as a mediator. *OMEGA J Death Dying*. 2020;80(3):490–503.
58. Moroz M, Dunkley DM. Self-critical perfectionism and depressive symptoms: Low self-esteem and experiential avoidance as mediators. *Personal Individ Differ*. 2015;87:174–9.
59. Fjorback LO, Arendt M, Ørnbøl E, Fink P, Walach H. Mindfulness-based stress reduction and mindfulness-based cognitive therapy—a systematic review of randomized controlled trials. *Acta Psychiatr Scand*. 2011;124(2):102–19.
60. Ebrahiminejad S, Poursharifi H, Roodsari AB, Zeinodini Z, Noorbakhsh S. The effectiveness of mindfulness-based cognitive therapy on Iranian female adolescents suffering from social anxiety. *Iran Red Crescent Med J*. 2016. <https://doi.org/10.5812/ircmj.25116>.
61. Querstret D, Morison L, Dickinson S, Cropley M, John M. Mindfulness-based stress reduction and mindfulness-based cognitive therapy for psychological health and well-being in nonclinical samples: a systematic review and meta-analysis. *Int J Stress Manag*. 2020;27(4):394.
62. van Son J, Nyklíček I, Pop VJ, Pouwer F. Testing the effectiveness of a mindfulness-based intervention to reduce emotional distress in outpatients with diabetes (DiaMind): design of a randomized controlled trial. *BMC Public Health*. 2011;11(1):1–11.

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