

# **Resilience and mental toughness as predictors of anxiety, depression, and mental well-being**

## **Abstract**

To examine how strongly the attributes of resilience and mental toughness predicted levels of anxiety, depression, and mental wellbeing, a quantitative online survey of 281 adults was employed. The survey was conducted in the United Kingdom (April to June, 2021), using opportunity sampling. Resilience, mental toughness, and mental wellbeing were measured by the 10 item Connor–Davidson Resilience Scale (CD-RISC), the 10 item Mental toughness Questionnaire (MTQ-10), and the 14-item Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS), respectively. In addition, the Hospital Anxiety and Depression Scale (HADS), measured Anxiety (HADS-A) and depression (HADS-D) and the Patient Health Questionnaire-9 (PHQ-9) was used to measure depression. Hierarchical multiple regression was used to analyse which attribute was the strongest predictor of mental health. Mental toughness was found to be a significantly stronger predictor of wellbeing ( $\beta = .54$ ) than resilience ( $\beta = .21$ ); of anxiety ( $\beta = -.70$  vs.  $.02$ , respectively); of HADS depression ( $\beta = -.52$  vs.  $-.15$ ), and of PHQ-9 depression ( $\beta = -.62$  vs.  $-.09$ ). We propose that mental toughness may predict wellbeing more strongly than resilience because it is a broader construct, incorporating proactive traits that enhance wellbeing. The findings suggest that training and interventions which enhance mental toughness in non-clinical populations may be more effective at promoting mental wellbeing, and reducing anxiety and depression, than those which enhance resilience. Further research is required to test these practical implications and to clarify why mental toughness is a stronger predictor than resilience of positive mental health.

**Keywords:** positive cognitive reappraisal; mental health; optimism; hope; adversity

## 1. Introduction

Globally, each year, approximately 17% of people suffer from a mental illness, with 29% of people suffering across their lifespan<sup>1</sup>. Depression is the leading cause of disability worldwide and in 2013 anxiety was ranked as the sixth global disability<sup>2</sup>. Despite this, mental health care can be poor, with 85% of people with mental disorders often left untreated in low- and middle-income countries<sup>3</sup>. In light of such widespread mental health issues, it is important to understand the extent to which a person's approach to life events can help them maintain wellbeing and good mental health. Two principal attributes that have been found to promote wellbeing and protect against adverse mental health are resilience and mental toughness<sup>4</sup>.

There is some debate over whether resilience is a personality trait or a skill<sup>5</sup>, but it has been defined as a positive adaptation to adverse experiences,<sup>6,7</sup> consisting of an individual's ability to mobilise their resources to overcome problems.<sup>4,8</sup> Research suggests that resilient individuals are more likely to return to healthy functioning after adversity than are less resilient individuals<sup>9</sup> and higher resilience is positively associated with better mental health, including lower anxiety and depression.<sup>7,8</sup>

The concept of mental toughness originated in sport, from a drive to develop mentally tough competitors to maximise performance.<sup>10</sup> Mental toughness, like resilience, is related to an individual's capacity to proactively solve problems despite adversity.<sup>11</sup> In addition, it also emphasises the importance of self-control, self-efficacy, and self-belief in facing difficulties.<sup>12</sup> Research has increasingly linked mental toughness to mental health and wellbeing using Clough et al.'s four Cs definition.<sup>11,13</sup> Here, mental toughness constitutes seeing difficulties as an opportunity (challenge), having high levels of self-belief (confidence), being able to stick to completing tasks (commitment) and a belief in

determining one's own destiny (control). Mental toughness predicts psychological wellbeing in undergraduate students<sup>13</sup> and several longitudinal studies have demonstrated a link between increased mental toughness and lower levels of anxiety and depression.<sup>14,15</sup> Two of the four Cs, commitment and confidence, have also been associated with recovery from mental illness.<sup>16</sup>

Definitions and measures of mental toughness suggest that it may be a broader, more future-oriented attribute than resilience, consisting of purposely developing and growing through challenge and adversity. This process has been described as transformative active toughening.<sup>11</sup> Conversely, while resilience is also a dynamic and adaptive attribute,<sup>7</sup> measures and definitions appear to place greater emphasis on it being a reactive adaptation to life stressors. However, both attributes are believed to reflect the thoughts, beliefs, and strategies an individual has when facing adverse life events, and which are crucial to the way they respond to those events. Indeed, resilience has been described as conceptually related to, and a sub-component of mental toughness, but not equivalent to it.<sup>17,18,19</sup> Certainly, there appears to be a great deal of conceptual overlap between resilience, the related concept of hardiness<sup>20</sup> and mental toughness.<sup>11,21</sup>

It is apparent that a person's resilience and mental toughness can influence their mental health, particularly anxiety and depression, but the extent to which each predicts mental health and wellbeing has not previously been measured in the same study. While there are several conceptual similarities between resilience and mental toughness, there are also important differences in emphasis and in their measurement. Given these similarities and differences, it is important and useful to explore which attribute is the strongest predictor of wellbeing and good mental health. As mental toughness appears to be a broader construct than resilience we tested the hypotheses that mental toughness would H1) predict

significantly more outcome variance over and above resilience, and H2) be a stronger predictor, based on the standardised estimate ( $\beta$ ).

## 2. Method

### 2.1 Participants

Power analyses (G\*Power ver. 3.1.9.7) with  $\alpha = .05$ ;  $\beta = .95$ ; and  $f^2 = 0.15$  (medium effect size) suggested  $N > 107$  as a sample size for a multiple regression with two predictors. Data were collected in the UK between April and June 2021 using online surveys and opportunity sampling. There were 294 participants in the initial sample. A subset was recruited via the Psychology Department's recruitment system (SONA) at our institution in return for participation credit ( $N = 24$ ). The remainder responded voluntarily and without compensation to posts via the first author's social media page, a running club, a local community group, and the National Institute for Health Research Centre for Engagement and Dissemination People in Research website. Thirteen exclusions were made for: Non-continuation following consent ( $N = 2$ ); Failure to answer one or more attention checks correctly ( $N = 9$ ); or missing an entire scale ( $N = 2$ ). The final sample size consisted of 281 participants:  $N_{female} = 211$  (75%);  $N_{male} = 68$  (24%);  $N_{non-binary} = 1$  (0.5%);  $N_{gender-missing} = 1$ , (0.5%), with a mean age of 48.44 years ( $SD = 15.39$ ; range 18-80;  $N = 277$ ,  $N_{age-missing} = 4$ ).

### 2.2 Ethics

The research was approved by the School of Psychology Ethics Committee at our institution (approval code: ENPR240321). All participants were treated in accordance with

the ethical guidelines of the British Psychological Society and Declaration of Helsinki. All participants provided informed consent and were free to withdraw. Data were anonymous.

### **2.3 Measures and Procedure**

The following measures were taken in this order: Age in years, Gender identity, Resilience (CD-RISC 10<sup>22</sup>), Health-related Mind-Set (8 items, 4 on anxiety, 4 on depression<sup>23</sup>), Mental Toughness Questionnaire (MTQ-10; 10 items<sup>24</sup>), the 14-item Hospital Anxiety and Depression Scale (HADS<sup>25</sup>), with two 7-item subscales, measuring Anxiety (HADS-A) and depression (HADS-D). Depression was also measured with the 9-item Patient Health Questionnaire-9 (PHQ-9<sup>26</sup>). Finally, we administered the 14-item Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS<sup>27</sup>).

The specific resilience and mental toughness measures were chosen due to their good balance between semantic coverage and brevity. The mental health measures were chosen because of their widespread use in both research and clinical settings, recommendations by The UK National Institute for Clinical Excellence, and use in the UK National Health Service. All measures were also chosen for their excellent psychometric properties. Mindset was not used in further analyses because, due to their double-barrel phrasing, the items measured both the presence of anxiety / depression and the rater's feelings of being able to change this.

### **2.4 Data preparation, missing data estimation**

All scales were scored in line with their published scoring instructions. Means for all participants for all scales / subscales were calculated, and missing data were replaced with

these scale / subscale means. For resilience,  $N_{missing} = 1$  datapoint; PHQ-9  $N_{missing} = 3$ ; Mental toughness and HADS  $N_{missing} = 4$ ; WEMWBS  $N_{missing} = 5$ . Each missing data point in each scale was from a separate participant and item, except for WEMWBS where one item had two missing data points. The 17 missing data points amounted to 0.1% of the total data. Following missing data estimation, sums for each scale / subscale were calculated for analysis.

## **2.5 Analysis plan and justification**

We verified correlations between key predictors (resilience, mental toughness) and outcomes (depression measures, anxiety, and wellbeing) with the aim of establishing the existence of significant associations as a precursor to our main analysis, multiple regression.

To test our hypotheses that mental toughness H1) would predict significantly more outcome variance over and above resilience, and H2) be a stronger predictor of the mental wellbeing outcomes, we built a series of hierarchical regression models, in which four outcome measures (HADS-D, HADS-A, PHQ-9, and WEMWBS) were predicted from resilience in Model 1, with mental toughness added in Model 2. Significant incremental prediction and a higher  $\beta$  would be taken as support for H1 and H2, respectively.

## **3. Results**

Scale means and *SDs* and their 95% Confidence Intervals are reported in Table 1. Because all measures had good / excellent Cronbach alphas, the calculation of scale totals was warranted. Scale totals were entered into Pearson's correlations, reported in Table 2.

<Table 1 about here>

<Table 2 about here>

All measures correlated significantly with each other. The two traits of resilience and mental toughness correlated positively with each other and with wellbeing. The mental health measures correlated negatively with the two traits and with wellbeing, and positively with each other. This was the expected pattern. None of the correlations suggested that any measures were identical to each other.

### 3.1 Multiple regression assumption checks

Initial regression models were run to establish whether the assumptions had been met. Two models had normally distributed residuals (Shapiro-Wilk  $W$ ). For Wellbeing,  $W(281) = 0.996, p = .747$ ; for HADS-Anxiety,  $W(281) = 0.994, p = .336$ . However, for the Depression measures the assumption was violated, HADS-Depression,  $W(281) = .973, p < .001$ , PHQ-9-Depression,  $W(281) = .954, p < .001$ . The predictors did not show problematic collinearity,  $VIF = 2.25 (< 5)$ . The Wellbeing model showed no heteroskedasticity, Breusch-Pagan ( $BP$ ) test,  $BP = .17, p = .92$ , nor did the HADS Anxiety model,  $BP = 2.79, p = .248$ , but the depression measures both showed heteroskedasticity, HADS-D,  $BP = 6.16, p < .046$ ; PHQ-9  $BP = 16.2, p < .001$ . There were no issues with outliers: In all models, the maximum Cook's distance was  $< 0.5$ . The Durbin-Watson ( $DW$ ) scores for autocorrelations were unproblematic ( $1 < DW < 3$ ): For wellbeing  $DW = 1.923$ , HADS-Anxiety  $DW = 2.114$ , HADS-Depression  $DW = 1.930$ , PHQ-9-Depression  $DW = 1.964$ . Based on nonnormality and

heteroskedasticity for both depression outcome models, final models of the depression outcomes were conducted with a wild bootstrap regression, which corrects for biased estimation of the confidence intervals, errors, and *p*-values of the coefficients. Anxiety and Wellbeing used unadjusted Ordinary Least Squares.

### **3.2 Regression Models**

Four hierarchical linear multiple regression models were built, in which the four mental health outcomes were predicted from resilience on its own in Model 1, then from resilience and mental toughness in Model 2. Full details are in Table 3. In all models, there was significant prediction of the outcome measures by resilience on its own (positive for wellbeing, negative for the mental health outcome measures), but in each model, adding mental toughness to the model significantly increased the prediction (Model 1 vs. Model 2 Comparison:  $p < .001$ , in all four models). In two instances (HADS-Anxiety, and PHQ-9-Depression) resilience was not a significant coefficient once mental toughness had been added to the model. In all instances, the  $\beta$  for mental toughness was much larger than for resilience, showing greater predictive power on each of the outcome measures, namely wellbeing ( $\beta = .54$  vs.  $\beta = .21$  predicted by mental toughness vs. resilience, respectively) anxiety ( $\beta = -.70$  vs.  $.02$ , respectively); HADS depression ( $\beta = -.52$  vs.  $-.15$ ), and PHQ-9 depression ( $\beta = -.62$  vs.  $-.09$ ).

**<Table 3 about here>**

## **4. Discussion**



This study aimed to investigate whether the attributes of resilience and mental toughness predicted mental health and wellbeing across a non-clinical sample. Hypotheses were that mental toughness would H1) predict significantly more outcome variance over and above resilience, and H2) be a stronger predictor, based on the standardised estimate ( $\beta$ ). Both hypotheses were supported on all outcome measures. Mental toughness was the attribute that best predicted anxiety, depression (HADS and PHQ-9), and mental wellbeing. Though resilience alone showed significant prediction in all outcome measures, adding mental toughness to each model significantly increased the prediction. In all instances, the  $\beta$  for mental toughness was much larger than for resilience, showing greater predictive power. In two instances (HADS-Anxiety, and PHQ-9-Depression) resilience was not a significant predictor once mental toughness had been added to the model. This latter finding was somewhat surprising given the body of research linking resilience to good mental health and wellbeing. To our knowledge, the present findings represent the first direct evidence that mental toughness may be more effective than resilience in mitigating mental health issues in a non-clinical population.

Resilience and mental toughness correlated significantly with each other, suggesting some overlap in the attributes that they measure, though the imperfect correlation showed that they were not identical. Despite the similarities between mental toughness and resilience, what makes mental toughness distinct from resilience, and the related constructs of hardiness and grit, has not been elucidated.<sup>18</sup> One important difference is that mental toughness appears to be a broader construct than resilience. Although both our instruments were unidimensional scales psychometrically, a more detailed examination of the items shows that the CD-RISC 10 contains a majority of items describing reactions to adverse events (e.g. bouncing back after illness or hardship; dealing with whatever comes). Mental toughness, on the other hand, has items tapping into a wider range of trait elements, including optimism (looking on the

bright side), self-esteem (feeling a worthwhile person) and self-regulation (remaining calm under pressure) while also measuring subcomponents of resilience, such as adaptive rebound, coping skills, hardiness, and commitment.<sup>10,11,17,21</sup>

Denovan et al.<sup>21</sup> explored the conceptual similarities between mental toughness, ego resiliency, self-efficacy, and grit. They found that each of these measures load on a common factor, which they term Non-Cognitive Adaptive Resourcefulness (NCAR). This construct is believed to reflect the ability to overcome obstacles by flexibly allocating personal resources (being adaptive and resourceful). Other research in the field of resilience has highlighted the importance of positive cognitive reappraisal (PCR) for mediating the beneficial effects of resilience on mental wellbeing.<sup>7</sup> Positive cognitive reappraisal reflects the ability to interpret a situation in a positive light, avoiding a pessimistic outlook, while adopting a realistic but positive evaluation of a situation. As mental toughness reflects feelings of being in control, optimism, self-belief and confidence, it is possible that it is a better measure, than is resilience, of constructs such as positive cognitive reappraisal and adaptive resourcefulness. If this is the case, it may be what makes mental toughness a better predictor of positive wellbeing in our study, and potentially a better defence mechanism against poor mental health.

Some limitations are acknowledged. There were more female than male participants in our sample, though this may be helpful in the context of a greater incidence of mental health issues in women. Mental health outcomes were based on self-report, albeit using tools used routinely for mental health assessments. Future research should include fuller diagnostic data or independent validation, e.g. clinical or expert assessments. Further research with prospective longitudinal designs should be conducted to establish whether pre-existing mental toughness and / or resilience may have mental health benefits at later time points. If

this is supported, mental toughness training could be a useful preventative measure that could be used in community mental health settings.

Irrespective of the reason why mental toughness is a stronger predictor of mental wellbeing than resilience, the findings have practical implications. They suggest that interventions which enhance mental toughness may have a stronger protective effect in maintaining wellbeing and good mental health in non-clinical populations, compared to interventions promoting resilience. For theoretical reasons, however, it is important to examine why mental toughness is a stronger predictor of mental wellbeing than resilience. This will enable a greater understanding of resilience and mental toughness, particularly with respect to their similarities and differences, how they are measured, and how they might be enhanced via training and other interventions.

## **5. Conclusions**

The findings show that in a non-clinical population mental toughness is more strongly predictive of good mental health than resilience. If our psychometrically-based observations translate into real-world outcomes, then promoting mental toughness, via training or coaching, may provide real mental health benefits. However, clinically-based research would be needed to provide stronger empirical support. Such further research is desirable, because having effective methods that enhance wellbeing can reduce the mental health burden on the individual and society.

**Declaration of competing interest:** None to declare

**Funding:** This project did not receive specific funding

## References

1. Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V, et al. The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. *International journal of epidemiology*. 2014;43(2):476-93.
2. Baxter AJ, Scott KM, Vos T, Whiteford HA. Global prevalence of anxiety disorders: a systematic review and meta-regression. *Psychological medicine*. 2013;43(5):897-910.
3. Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bromet EJ, et al. Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. *The Lancet*. 2007;370(9590):841-50.
4. Stainton A, Chisholm K, Kaiser N, Rosen M, Upthegrove R, Ruhrmann S, et al. Resilience as a multimodal dynamic process. *Early intervention in psychiatry*. 2019;13(4):725-32.
5. Leys C, Arnal C, Wollast R, Rolin H, Kotsou I, Fossion P. Perspectives on resilience: personality trait or skill? *European journal of trauma & dissociation*. 2020;4(2):100074.
6. Amstadter AB, Moscati A, Maes HH, Myers JM, Kendler KS. Personality, cognitive/psychological traits and psychiatric resilience: A multivariate twin study. *Personality and Individual Differences*. 2016;91:74-9.
7. Riepenhausen A, Wackerhagen C, Reppmann ZC, Deter H-C, Kalisch R, Veer IM, et al. Positive cognitive reappraisal in stress resilience, mental health, and well-being: A comprehensive systematic review. *Emotion Review*. 2022;14(4):310-31.
8. Harris MA, Brett CE, Starr JM, Deary IJ, McIntosh AM. Early-life predictors of resilience and related outcomes up to 66 years later in the 6-day sample of the 1947 Scottish mental survey. *Social psychiatry and psychiatric epidemiology*. 2016;51:659-68.
9. Nestler EJ, Waxman SG. Resilience to stress and resilience to pain: lessons from molecular neurobiology and genetics. *Trends in molecular medicine*. 2020;26(10):924-35.
10. Jones G, Hanton S, Connaughton D. What is this thing called mental toughness? An investigation of elite sport performers. *Journal of applied sport psychology*. 2002;14(3):205-18.
11. Clough P, Earle K, Sewell D, Cockerill I. *Solutions in sport psychology*. London: Thomson. 2002.
12. Lin Y, Mutz J, Clough PJ, Papageorgiou KA. Mental toughness and individual differences in learning, educational and work performance, psychological well-being, and personality: A systematic review. *Frontiers in psychology*. 2017;8:1345.
13. Stamp E, Crust L, Swann C, Perry J, Clough P, Marchant D. Relationships between mental toughness and psychological wellbeing in undergraduate students. *Personality and Individual Differences*. 2015;75:170-4.
14. Gerber M, Best S, Meerstetter F, Walter M, Ludyga S, Brand S, et al. Effects of stress and mental toughness on burnout and depressive symptoms: A prospective study with young elite athletes. *Journal of Science and Medicine in Sport*. 2018;21(12):1200-5.
15. Grobler H, du Plooy K, Kruger P, Ellis S. The prevalence of common mental disorders and its relationship with mental toughness in professional South African rugby players. *South African Journal of Psychology*. 2022;52(1):61-72.
16. Ramshaw G, St Clair-Thompson H. The relationship between mental toughness and subjective mental illness recovery. *New Ideas in Psychology*. 2021;63:100881.
17. Gucciardi DF, Gordon S, Dimmock JA. Towards an understanding of mental toughness in Australian football. *Journal of applied sport psychology*. 2008;20(3):261-81.

18. Gucciardi DF. Commentary: Mental toughness and individual differences in learning, educational and work performance, psychological well-being, and personality: A systematic review. *Frontiers in psychology*. 2018;8:2329.
19. Papageorgiou KA, Malanchini M, Denovan A, Clough PJ, Shakeshaft N, Schofield K, et al. Longitudinal associations between narcissism, mental toughness and school achievement. *Personality and Individual Differences*. 2018;131:105-10.
20. Mazerolle SM, Eason CM, Goodman A. An examination of relationships among resiliency, hardiness, affectivity, and work-life balance in collegiate athletic trainers. *Journal of athletic training*. 2018;53(8):788-95.
21. Denovan A, Dagnall N, Drinkwater K. Examining what Mental Toughness, Ego Resiliency, Self-efficacy, and Grit measure: An exploratory structural equation modelling bifactor approach. *Current Psychology*. 2022:1-16.
22. Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the connor–davidson resilience scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*. 2007;20(6):1019-28.
23. Schroder HS, Dawood S, Yalch MM, Donnellan MB, Moser JS. Evaluating the domain specificity of mental health–related mind-sets. *Social Psychological and Personality Science*. 2016;7(6):508-20.
24. Dagnall N, Denovan A, Papageorgiou KA, Clough PJ, Parker A, Drinkwater KG. Psychometric assessment of shortened Mental Toughness Questionnaires (MTQ): factor structure of the MTQ-18 and the MTQ-10. *Frontiers in psychology*. 2019;10:1933.
25. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*. 1983;67(6):361-70.
26. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*. 2001;16(9):606-13.
27. Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health and Quality of life Outcomes*. 2007;5(1):1-13.

Table 1: Key metrics for all measures

	Resilience	Mental Toughness	HADS-Anxiety	HADS-Depression	PHQ-9-Depression	WEBWMS Wellbeing
<b>Cronbach</b>						
<b><math>\alpha</math></b>	0.90	0.85	0.86	0.86	0.91	0.95
<i>Lower</i>	0.88	0.82	0.84	0.83	0.89	0.94
<i>Upper</i>	0.92	0.87	0.89	0.88	0.92	0.96
<b>Mean</b>	27.63	33.47	7.88	4.83	6.61	47.09
<i>Lower</i>	26.81	32.71	7.35	4.37	5.87	45.80
<i>Upper</i>	28.46	34.22	8.40	5.30	7.35	48.39
<b>SD</b>	7.06	6.48	4.48	3.99	6.35	11.07
<i>Lower</i>	6.52	5.99	4.14	3.68	5.87	10.22
<i>Upper</i>	7.70	7.07	4.89	4.35	6.93	12.07

Note:  $\alpha$ : Cronbach's alpha; Lower / Upper: Lower and upper bound of 95% Confidence Interval.

Table 2: Pearson's correlations

		<i>r</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>
Resilience	Mental Toughness	0.745	0.688	0.793
Resilience	HADS-Anxiety	-0.504	-0.587	-0.412
Resilience	HADS-Depression	-0.534	-0.613	-0.445
Resilience	PHQ-9-Depression	-0.549	-0.626	-0.462
Resilience	Wellbeing	0.616	0.538	0.684
Mental Toughness	HADS-Anxiety	-0.687	-0.744	-0.620
Mental Toughness	HADS-Depression	-0.628	-0.694	-0.551
Mental Toughness	PHQ-9-Depression	-0.683	-0.741	-0.615
Mental Toughness	Wellbeing	0.699	0.634	0.754
HADS-Anxiety	HADS-Depression	0.676	0.607	0.735
HADS-Anxiety	PHQ-9-Depression	0.744	0.687	0.792
HADS-Anxiety	Wellbeing	-0.680	-0.739	-0.612
HADS-Depression	PHQ-9-Depression	0.777	0.726	0.820
HADS-Depression	Wellbeing	-0.783	-0.825	-0.734
PHQ-9-Depression	Wellbeing	-0.764	-0.809	-0.710

Note: For all Pearson correlations:  $df = 279, p < .001$ . *CI*: Confidence Interval

Table 3: Multiple regression results

<b>Wellbeing</b>	<i>R</i>	<i>R</i> <sup>2</sup>	<i>Adjusted R</i> <sup>2</sup>		<i>RMSE</i>	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Model 1	0.616	0.379	0.377		8.71	170	1	279	<.001
Model 2	0.714	0.509	0.506		7.74	144	2	278	<.001
		$\Delta R^2$							
Model Comparison	0.13				73.6	1	278	<.001	
Model Coefficients	<i>B</i>	<i>SE</i>	Lower	Upper	<i>t</i>	<i>p</i>	$\beta$	Lower	Upper
Intercept	6.973	2.446	2.158	11.789	2.85	0.005			
Resilience	0.335	0.099	0.141	0.529	3.39	<.001	0.214	0.090	0.338
Mental Toughness	0.922	0.108	0.711	1.134	8.58	<.001	0.540	0.416	0.664
<b>HADS-Anxiety</b>	<i>R</i>	<i>R</i> <sup>2</sup>	<i>Adjusted R</i> <sup>2</sup>		<i>RMSE</i>	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Model 1	0.504	0.255	0.252		0.55	95.2	1	279	<.001
Model 2	0.687	0.472	0.469		0.46	124.5	2	278	<.001
		$\Delta R^2$							
Model Comparison	0.218				115	1	278	<.001	
Model Coefficients	<i>B</i>	<i>SE</i>	Lower	Upper	<i>t</i>	<i>p</i>	$\beta$	Lower	Upper
Intercept	3.398	0.147	3.109	3.687	23.148	<.001			
Resilience	0.001	0.006	-0.010	0.013	0.251	0.802	0.016	-0.112	0.145
Mental Toughness	-0.069	0.006	-0.082	-0.056	-10.72	<.001	-0.699	-0.828	-0.571
<b>HADS-Depression</b>	<i>R</i>	<i>R</i> <sup>2</sup>	<i>Adjusted R</i> <sup>2</sup>		<i>RMSE</i>	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Model 1	0.534	0.285	0.282		3.37	111.2	1	279	<.001
Model 2	0.635	0.404	0.4		3.07	94.1	2	278	<.001
		$\Delta R^2$							
Model Comparison	0.119				55.4	1	278	<.001	
Model Coefficients	<i>B</i>	<i>SE (Bca)</i>	Lower (Bca)	Upper (Bca)	<i>t (OLS)</i>	<i>p (BCa)</i>	$\beta$	Lower	Upper
Intercept	17.791	0.991	15.790	19.788	18.32	<.001			
Resilience	-0.084	0.059	-0.195	0.023	-2.15	0.033	-0.149	-0.286	-0.012
Mental Toughness	-0.318	0.055	-0.422	-0.210	-7.45	<.001	-0.517	-0.653	-0.380
<b>PHQ-9-Depression</b>	<i>R</i>	<i>R</i> <sup>2</sup>	<i>Adjusted R</i> <sup>2</sup>		<i>RMSE</i>	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Model 1	0.549	0.301	0.299		5.30	120	1	279	<.001
Model 2	0.686	0.470	0.466		4.62	123	2	278	<.001
		$\Delta R^2$							
Model Comparison	0.169				88.7	1	278	<.001	
Model Coefficients	<i>B</i>	<i>SE (BCa)</i>	Lower (BCa)	Upper (BCa)	<i>t (OLS)</i>	<i>p (BCa)</i>	$\beta$	Lower	Upper
Intercept	29.054	1.552	26.168	31.721	19.92	<.001			
Resilience	-0.081	0.077	-0.230	0.071	-1.38	0.314	-0.090	-0.219	0.039
Mental Toughness	-0.604	0.074	-0.748	-0.453	-9.42	<.001	-0.616	-0.745	-0.487

Table 3 Note: Results from four hierarchical multiple regression models. Model 1 only has Resilience as the predictor; in Model 2 Mental Toughness was added. RMSE = Root Mean Square Error. *B*: Unstandardized Estimate;  $\beta$ : Standardized Estimate, Upper / Lower: Upper and lower bounds of the 95% Confidence Interval; BCa: Bias-corrected accelerated (where “(BCa)” is indicated, results are based on 2000 wild bootstrap samples); *t* (OLS): *t* generated by the Ordinary Least Squares version of the model.