



Impact of a Resilience Program on Student Anxiety, Depression and Mental Toughness

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Abstract: The United Arab Emirates National Vision 2021 aims to position the UAE as one of the top five happiest countries in the world. Positive psychology in schools will play a critical role in achieving this vision by enhancing the well-being of students through fostering character strengths, resilience, wellbeing and abilities. Despite the growth of positive psychology in the region, efforts to assess its effectiveness remain scarce. We highlight the work of a resilience program to illustrate how it can further this development. Experimental studies have investigated the impact of resilience programs in schools using anxiety and depression measures and correlational studies have explored the relationship between mental toughness and educational outcomes. Yet, no study has investigated the relationship between anxiety, depression and mental toughness, nor measured the impact of a resilience program on these variables. To address this, we conducted a 6-week experimental study to investigate the impact of the Weaving Well-being Tools of Resilience Programme on 134 Year 5 students in an Abu Dhabi primary school. Correlational analysis showed a strong, positive relationship between anxiety and depression ($r = .69, p < .001$) and a strong negative relationship between mental toughness and anxiety ($r = -.57, p < .001$) and mental toughness and depression ($r = -.64, p < .001$). Analysis of variance found that the resilience program had no significant effect. However, the potential for a school-based resilience program to deliver significant results remains.

تهدف رؤية الإمارات العربية المتحدة الوطنية 2021 إلى جعل الإمارات واحدة من أسعد خمس دول في العالم. سيلعب علم النفس الإيجابي في المدارس دورًا مهمًا في تحقيق هذه الرؤية من خلال تعزيز رفاهية الطلاب من خلال تعزيز قدرات الشخصية والمرونة والرفاهية والقدرات. على الرغم من نمو علم النفس الإيجابي في الشرق الأوسط، لا تزال الجهود المبذولة لاختبار وتقييم فعاليته شحيحة. نسلط الضوء على عمل برنامج المرونة لتوضيح كيف يمكن أن تزيد من تطوير علم النفس الإيجابي في المنطقة. درست الدراسات التجريبية تأثير برامج المرونة في المدارس باستخدام مقاييس القلق والاكتئاب واستكشفت الدراسات الترابطية العلاقة بين المتانة الذهنية والنتائج التعليمية. ومع ذلك، لم تحقق أي دراسة في العلاقة بين القلق والاكتئاب والمتانة الذهنية، ولم تقيس تأثير برنامج المرونة على هذه المتغيرات الثلاثة. ولمعالجة هذه الثغرات، أجرينا دراسة تجريبية مدتها 6 أسابيع لاستقصاء تأثير برنامج أدوات رفاهية نسج النسيج على 134 طالبًا في السنة الخامسة في إحدى مدارس أبوظبي الابتدائية. أظهر التحليل الارتباطي وجود علاقة قوية وإيجابية بين القلق والاكتئاب ($r = .69, p < .001$) والعلاقة السلبية القوية بين المتانة والقلق العقلي ($r = -.57, p < .001$)، والمتانة الذهنية والاكتئاب ($r = -.64, p < .001$). وجد تحليل التباين أن برنامج المرونة لم يكن له تأثير كبير. ومع ذلك، لا تزال هناك إمكانية لبرنامج مرونة على أساس مدرسي لتحقيق نتائج مهمة.

Keywords: resilience; positive education; positive psychology; United Arab Emirates; mental toughness; students



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Globally, the World Health Organization (WHO) estimates that 450 million people suffer from poor mental health, with anxiety and depression costing US \$1 trillion per year in lost productivity (WHO, 2017). In the United Arab Emirates (UAE), adult levels of anxiety and depression are above the global average at 4.1% and 5.1% respectively (WHO, 2017). Mental health problems in adults can often be traced to issues developed in childhood, with 10% to 20% of children suffering difficulties with mental health (Keiling et al., 2011). Once an individual has suffered with a mental health disorder, the likelihood of its recurrence increases; therefore, the earlier problems can be addressed, the more likely problems in later life can be avoided (Silverman & Ginsburg, 1998). Research has advocated developing positive mental health for children, 'through school-based interventions that promote competency and psychological strengths' (WHO, 2005, p. 43) and developing resilience using interventions from the domain of positive psychology (PP) (Reivich & Shatte, 2002).

PP aims to improve well-being by proactively focusing on positive emotions rather than negative ones and preventing mental health disorders, rather than treating them (Seligman, 2002; Seligman & Csikszentmihalyi, 2000). Seligman, Steen, Park and Peterson (2005) promote the development of well-being through the use of positive psychology interventions (PPIs), techniques that cultivate positive feelings, behaviours or cognitions (Sin & Lyubomirsky, 2009). Research in education has found that PPIs enhance well-being and resilience, and reduce symptoms of anxiety and depression (Dulagil, Green, & Ahern, 2016; Ewan & Green, 2013).



Positive Education (PosEd) seeks to achieve these outcomes by fostering character strengths, resilience, wellbeing and abilities in an educational setting (Hoare et al., 2017). A resilience program is one of the key components of PosEd. Globally, awareness of PosEd is increasing and receiving support from students, teachers and parents. However, PosEd requires significant financial investment, staff training and curricular reform. With limited resources and competing priorities, convincing education leaders who run schools and universities to adopt PosEd remains a challenge (Global Council for Happiness and Wellbeing, 2019).

The United Arab Emirates (UAE) National Agenda and Vision 2021 aim to position the UAE as one of the top five happiest countries in the world (Global Happiness Council, 2018). Improving the nation's happiness is encouraged by the government under the direction of a Minister of State for Happiness and Wellbeing (Omar, 2018). According to the Global Happiness Council, PP in schools will play a critical role in achieving this vision by enhancing the well-being of students (2018). The opportunity for the UAE to adopt a leading role in the development of PosEd has been recognised by the Institute of Positive Education (IPE) which has established a Middle East and North Africa (MENA) regional office in Dubai. IPE is one of the foremost authorities in the development of PosEd. It advocates the Geelong Grammar School Applied Model for Positive Education (GGs Model), which proposes four interconnecting processes; 'Learn It, Live It, Teach It, Embed It' (Hoare et al., 2017).

The UAE's resources are abundant and support for such initiatives comes from the highest levels. However, much still needs to be done in terms of analysing and publicising the results of happiness policies and programs, particularly with respect to changes in education and the workforce (Omar, 2018). Additionally, many PP practitioners operating regionally are non-Emiratis, who tend to employ Western-centric psychological models. However, research into the development of indigenous PP models, which may be more aligned to the UAE context, has begun (Lambert, Pasha-Zaidi, Passmore, & York Al-Karam, 2015).

Previous research into PosEd in the MENA region is relatively limited. A semester-long PP-based program was conducted in Kuwait secondary schools and university to increase positive emotions and flourishing (Lambert, Passmore, Scull, Al Sabah, & Hussain, 2019). Another 14-week PPI program was introduced to university students to assess the impact on both hedonic and eudaimonic wellbeing and beliefs about the fear and fragility of happiness in the UAE (Lambert, Passmore, & Joshanloo, 2019). Four Arabic studies delivered PP interventions (PPI) in Egypt, Kuwait and Jordan to improve subjective wellbeing in a variety of groups such as university students, females with learning difficulties, injured military personnel and diabetics (Al-Hattab, 2017; Al-Wakeel, 2010; Al-Yamani, Al-Adel & Hussein, 2014; Ramadan, 2014). However, none focused on a resilience program within a primary school context and the Arabic studies were conducted from a positive psychotherapy perspective.

Our research aimed to validate and contribute to these initiatives, studies and research, by delivering a PP-based resilience program in an Abu Dhabi primary school. Research on resilience programs has been limited to measuring the negative indicators of anxiety and depression; therefore, we added to this knowledge-base by measuring a positive indicator, mental toughness (MT). Further, research into MT in education has involved only correlational studies (Crust et al.,



2014; St Clair-Thompson, Bugler, McGeown & Clough, 2012; St Clair-Thompson et al., 2015). We sought to develop a deeper understanding in this field by conducting an experimental study.

Anxiety, Depression, Mental Toughness and Resilience

Anxiety involves an unpleasant state of psychological turmoil, often accompanied by nervous behaviour, physical ailments and negative thinking (Seligman, Walker, & Rosenhan, 2000). Symptoms of anxiety impact adversely on individual and academic effectiveness (Woodward & Fergusson, 2001). Public Health England (2016) found that anxiety affects 2.2% of children aged between 5 and 10 years and 4.4% of children aged between 11 and 16 years (2016). Depression is a condition in which feelings of unhappiness, dejection and lethargy can affect an individual's cognitive, functional and emotional well-being (American Psychiatric Association, 2013). In England, 0.2% of children aged between 5 and 10 years, and 1.4% of children aged between 11 and 16 years, experience symptoms of depression. Research indicates a strong correlation between anxiety and depression (Batterham, Christensen, & Callear, 2013; Frewen, Schmittmann, Bringman, & Borshoom, 2013) and anxiety symptoms have been shown to be predictors of depression (Lewinsohn, Clarke, Hops, & Andrews, 1990; Seeley, Rohde, Lewinsohn, & Clarke, 2002). Previous studies have focused on determining the pre-existence of the negative indicators of anxiety and depression and mitigating their symptoms. However, this does not support a strengths-based approach to mental health.

MT is a personality trait that determines an individual's ability to perform consistently under stress and pressure (Strycharczyk & Clough, 2015). MT can be viewed through the context of the resilience construct (Dyer & McGuinness, 1996), which highlights the value of cognition in regulating the impact of adversity and moving forward from it (Clough, Earle, & Strycharczyk, 2012). It also builds on the hardiness construct of control, commitment and challenge (Kobasa, 1979). MT sub-divides control into life and emotional control, and adds confidence as a fourth component, which is divided into confidence in abilities and interpersonal confidence.

Studies show that mentally tough individuals have lower levels of anxiety (Horsburgh, Schermer, Veselka, & Vernon, 2009) and reduced symptoms of depression (Gerber et al., 2013). MT has also been identified as a characteristic which contributes to academic success (Lin, Clough, Welch, & Papageorgiou, 2017), showing a strong, positive relationship with motivation, behaviour, attendance, attainment and peer relationships (Crust et al., 2014; St Clair-Thompson et al., 2012, 2014). Still, Horsburgh et al. (2009) found MT to be strongly influenced by genetics and difficult to modify. Despite this, these researchers concluded it possible for MT to be developed by strengthening individual control and commitment, and to be shaped by life experiences (Lin et al., 2017). As an example, Sheard and Golby (2006) found that MT in athletes could be enhanced through an intervention consisting of positive thinking, visualisation, anxiety control, attentional control and goal setting; a position supported by Strycharczyk et al. (2015). Limitations of research into MT in education include an absence of experimental studies (St Clair-Thompson et al., 2015), a lack of diversity within study participants (Crust et al., 2014), the use of self-reporting measures and a lack of longitudinal measurement (Crust et al., 2014; Lin et al., 2017).



There are many definitions of resilience. The one we consider most appropriate for this study is ‘the ability to cope effectively in challenging situations’ (Rutter, 1985, p. 599). High levels of resilience in individuals were shown to be predictive of lower levels of anxiety and depression (Hjendal, Vogel, Solem, Hagen, & Stiles, 2011). Many school-based programs have been created to develop resilience in young people, with many reporting a small, but significant, decrease in anxiety and/or depression (Barrett, Farrell, Ollendick, & Dadds, 2006; Lock & Barrett, 2003; Lowry-Webster, Barrett, & Lock, 2003; Werner-Seidler, Perry, Calcar, Newby, & Christensen, 2017). Our study focused on the Penn Resiliency Program (PRP; Gillham, Jaycox, Reivich, Seligman, & Silver, 1990) and the UK Resiliency Program (UKRP; Challen, Machin, & Gillham, 2014). The UKRP is a version of the PRP, which has been adapted to take account of national differences in examples and vocabulary. We also selected the Weaving Well-being Tools of Resilience Programme (WWTRP; Forman & Rock, 2016) as a recently developed and researched PP-based resilience program.

The findings of previous research into these programs are mixed. A meta-analysis summarising the impact of the PRP in 17 studies (Brunswasser, Gillham, & Kim, 2009) and a trial of the UKRP in 16 schools (Challen et al., 2014) both reported a small, significant decrease in depression. However, Bastounis, Callaghan, Banerjee and Michail (2016) studied nine PRP trials and found no evidence of the program reducing anxiety or depression. Challen et al. (2014) also found no significant decrease in anxiety using the UKRP. Conversely, a recent action research study using the WWTRP reported a significant decrease in levels of anxiety in six out of eight students (McGrath, 2017). The limitations of these studies included a lack of random sampling (Challen et al., 2014) and an over-reliance on negative indicators (Rivet-Duval, Heriot, & Hunt, 2010). McGrath’s study (2017) was taught by the researcher with her own pupils. Such an approach can be considered imperfect, due to the potential impact of personal bias and the inability to identify conclusively the effectiveness of specific interventions (Bolier et al., 2013). Calcar et al. (2016) found that resilience programs were more effective when delivered by specialists rather than school staff, due to the absence of personal bias. McGrath’s (2017) study also had a very small sample size and no control group.

The Present Study

The WWTRP (Forman & Rock, 2016) was selected for our study as it is a PP-based resilience program designed for Year 5 students. It involves a series of PPIs to build resilience and well-being. WWTRP is based on self-efficacy theory (SET) (Bandura, 1986) and the PERMA well-being theory (Seligman, 2011). SET is the optimistic self-belief in one’s ability to successfully accomplish a task and achieve a favourable outcome (Bandura, 1986). PERMA measures five elements which are theorised to build human flourishing: positive emotions, engagement, relationships, meaning and accomplishments. A flourishing individual possesses all five elements (Seligman, 2011). The PPIs in the WWTRP are based on cognitive behavioural therapy (CBT), which allows individuals to explore the connection between their thoughts, emotions and behaviours in responding to life situations (Beck, 1976). CBT has been shown to have a significant effect on symptoms of anxiety and depression (Brunswasser et al., 2009; Dray et al., 2017).



The purpose of our study was to investigate the impact of the WWTRP on levels of anxiety, depression and MT in Year 5 students. Our study's first aim was to confirm that a significant correlation exists between anxiety and depression (Batterham et al., 2013; Frewen et al., 2013), depression and MT (Gerber et al., 2013), and establish whether there is a correlation between MT and anxiety. This aim generated our first hypothesis; that there would be a statistically significant correlation between anxiety and depression, mental toughness and anxiety, and mental toughness and depression. Our second aim was to confirm that the WWTRP would reduce levels of anxiety and depression as reported by previous studies (Barrett et al., 2006; Brunswasser et al., 2009; Challen et al., 2014; Lock & Barrett, 2003; Lowry-Webster et al., 2003; McGrath, 2017; Werner-Seidler et al., 2017). Our third aim was to examine the effect of WWTRP on MT, as a positive indicator. These two aims generated our subsequent hypotheses; secondly that there would be no difference between the experimental and control group in anxiety, depression and MT at time 1 (T1); thirdly, that there would be a significant difference between the experimental and control group in the three dependant variables at time 2 (T2); and fourthly, that there would be a significant reduction in levels of anxiety, depression and MT between T1 and T2 for the experimental group, but not for the control group.

As such, our study redressed the imbalance in prior research that focused on negative outcomes by also measuring a positive indicator, MT. We sought to establish whether previous research results for MT in athletes could be achieved in education using PP. Our study addressed the limitations of self-administering PPIs by teaching them as a classroom-based program. Yet, we retained the use of self-reporting questionnaires to allow comparison with prior research. We used a large sample size, included a control group and prevented personal bias by using the researcher, a qualified teacher with no prior knowledge of the school, to deliver the program. We also built on McGrath's (2017) work by measuring the impact of WWTRP on depression and MT.

Method

Participants

The participants were 139 Year 5 students from an Abu Dhabi primary school (70 boys and 69 girls). The final sample comprised 134 participants (66 boys and 68 girls) with five students excluded from the study; four due to absence and one due to parental choice. Participants' age range was 10 years +/-5 months. Study participants represented multiple religions (46.3% Muslim; 41.8% Christian; 12% Other/None) and 13 different nationalities, with 87% being expatriates (n=98 British; n=17 Emirati; n=5 Australian; n=2 New Zealand; n=3 Egyptian; n=2 Pakistani; n=2 Dutch and n=1 from Canada, Ireland, Italy, France, and Ecuador respectively). A total of 64% came from non-English speaking backgrounds (NESBs). Three classes totalling 83 students were assigned to the experimental group and two classes (n=51) were assigned to the control group. All classes included students of mixed ability, gender, nationality and religion and were representative of the cluster sample. Demographic data were collected directly from the school records system. All pupils were taught the British curriculum in English language; thus, scales were not translated. No exclusion criteria, rewards or incentives were applied.



Materials

We used the Spence Children's Anxiety Scale (SCAS; Spence, 1997) and Depression Self Rating for Children (DSRC; Birlson, 1978) to provide a comparison with previous research. The SCAS was used to measure anxiety and previously used by McGrath (2017) to measure the WWTRP's impact. It is a validated self-reporting scale for participants aged 8 to 15 years. The scale contains 44 items, 38 of which relate to symptoms of anxiety, with six being dummy items aiming to reduce negative bias by requiring positive responses. Using a 4-point Likert-style scale, participants responded, Never (0), Sometimes (1), Often (2) or Always (3) in relation to how often they experienced each symptom. Higher scores equal more anxiety. The tool shows a very high internal reliability ($\alpha = 0.87$ to 0.94) (Ramme, 2008) with good construct validity, which can be used across cultures (Orgiles, Fernandez-Martinez, Guillen-Riquelme, Espada, & Essau, 2016).

The DSRC was used to assess depressive symptoms, as prior research used a depression scale to measure the impact of PRP and UKRP. It is suitable for participants 8 to 14 years of age. The scale contains 18 items. Using a 3-point Likert-style scale, participants responded, Mostly (0), Sometimes (1) or Never (2) to how often they experienced each item in the previous week. Higher scores equal more depression. Individual items have a good reliability coefficient ($\alpha = 0.65$ to 0.95) and adequate factorial validity. The predictive value of the total DSRC score compares favourably with the occurrence of depression in children (Birlson, 1981).

The MTQ48 was used to measure MT and is suitable for participants from age 10 years and older. The tool measures overall MT and its six subscales of challenge, commitment, control (emotional, life) and confidence (abilities, interpersonal). The scale contains 48 items. Using a 5-point Likert-type scale, participants responded, Strongly Disagree (1), Disagree (2), Neither Agree Nor Disagree (3), Agree (4) or Strongly Agree (5) to each item. Higher scores equal more mental toughness. The questionnaire is available in two vocabulary options, normal and simplified. The simplified option was selected to support students from NESBs. The MTQ48 shows excellent factorial validity and acceptable internal consistency in 5 out of 6 subscales ($\alpha = 0.78$ to 0.85) with the control factor being less consistent ($\alpha = 0.65$).

Procedure

This research was approved by the University of East London, School of Psychology Research Ethics Committee and followed the standard of research ethics set by the British Psychological Society. The Headteacher gave written consent for students to participate and a meeting was held with School Staff to explain the study's aims and methodology. The Head of Year 5 randomly assigned classes to the experimental and control groups. Online scales were administered to classes at T1 and T2 and students were allocated identification numbers to ensure anonymity. Each item was read out to support students from NESBs. After each scale, students were debriefed and given the opportunity to ask questions. In sum, six one-hour lessons were taught to the experimental group by the researcher. The control group followed their normal timetable. The program comprised an initial lesson introducing students to the concept of well-being, followed by the first five lessons of the WWTRP. Each lesson began with students



completing a well-being self-assessment to assess and monitor their mental health and ended with students completing a journal to reflect on their learning experience.

Results

Data was analysed using SPSS Version 25 (IBM, 2017). Data was screened for errors and descriptive statistics calculated. Normality was assessed and confirmed based on skewness and kurtosis values in conjunction with histograms, P-P and Q-Q plots. Statistical analysis was undertaken to test each hypothesis. Correlation analysis was used to examine the strength of the relationship between anxiety and depression, depression and MT and MT and anxiety. Analysis of variance was used to compare the mean scores for anxiety, depression and MT by group (control, experimental) at T1 and T2, and then to explore if there was a significant difference between T1 and T2 in the experimental group, but not the control group.

Table 1

Means, Standard Deviations, and T-Test Results

Variable	Group	T1		T2		df	t	p	Cohen's d
		M	SD	M	SD				
Anxiety	Control	44.47	18.92	39.67	19.06	132	-.409	.683	.071
	Exp	43.22	16.1	40.27	17.38				
Depression	Control	12.24	5.06	10.78	4.80	132	-.306	.768	.056
	Exp	11.95	5.29	10.19	6.03				
MT	Control	2.99	0.35	3.02	0.38	132	.004	.997	.000
	Exp	2.99	0.38	3.03	0.43				

Note: Exp = Experimental; MT = Mental Toughness; Alpha was set at 0.05



Table 1 provides the descriptive statistics and t-test results at T1 for anxiety, depression and MT. T1 scores were equivalent between groups (control and experimental) and show that cluster sampling was effective, which allowed us to use the parametric method of data analysis.

Table 2

Intercorrelations for Dependent Variables at T2

Measure	1	2	3
1. Anxiety	---		
2. Depression	.694	---	
3. MT	-.565	-.635	---

Note: All coefficients are significant at $p < .0001$

Table 2 shows the relationship between the variables. Our correlation analysis revealed a significant positive correlation between anxiety and depression, and significant negative correlations between mental toughness and anxiety, and MT and depression.

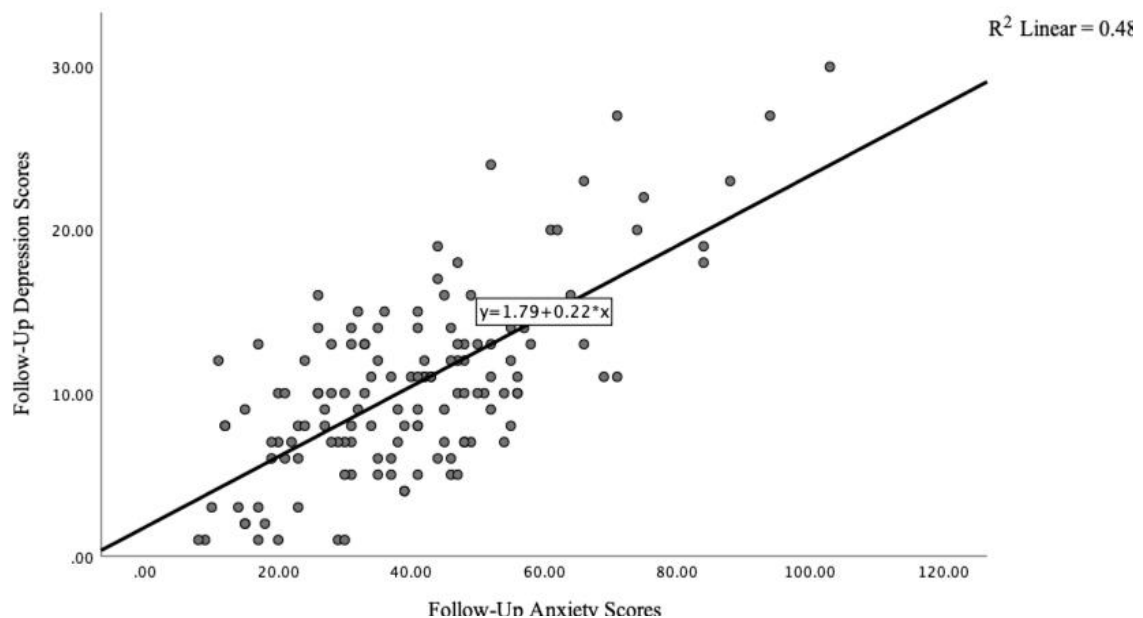


Figure 1. Exploring a Linear Relationship between Anxiety and Depression at T2

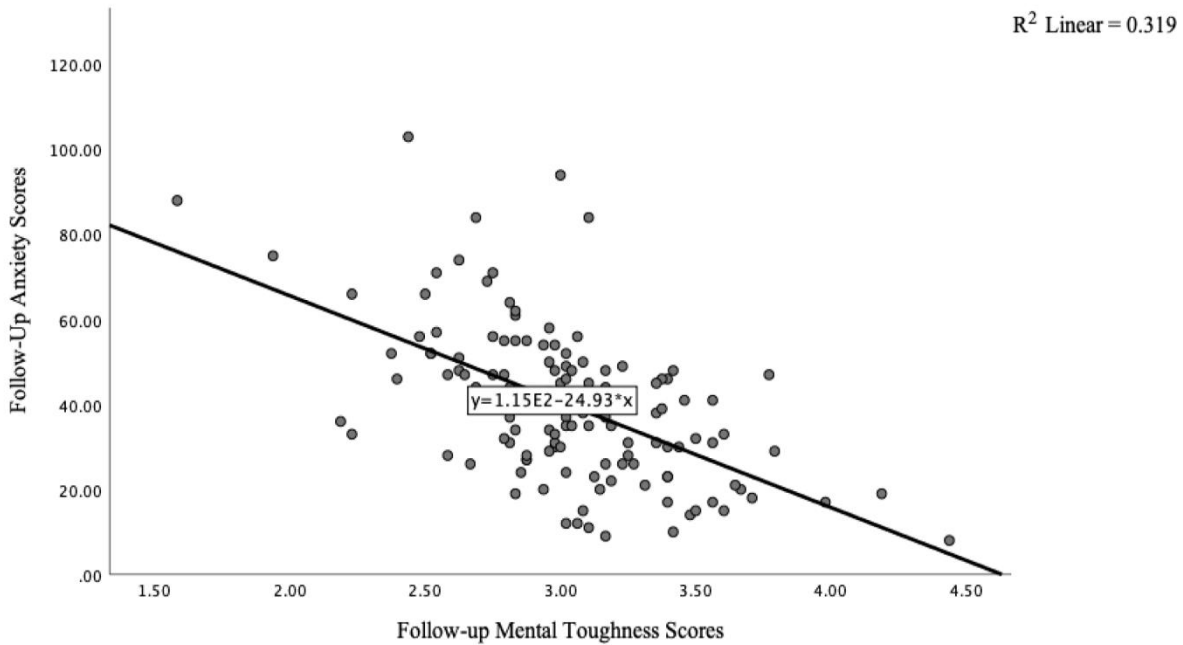


Figure 2. Exploring a Linear Relationship between Mental Toughness and Anxiety at T2

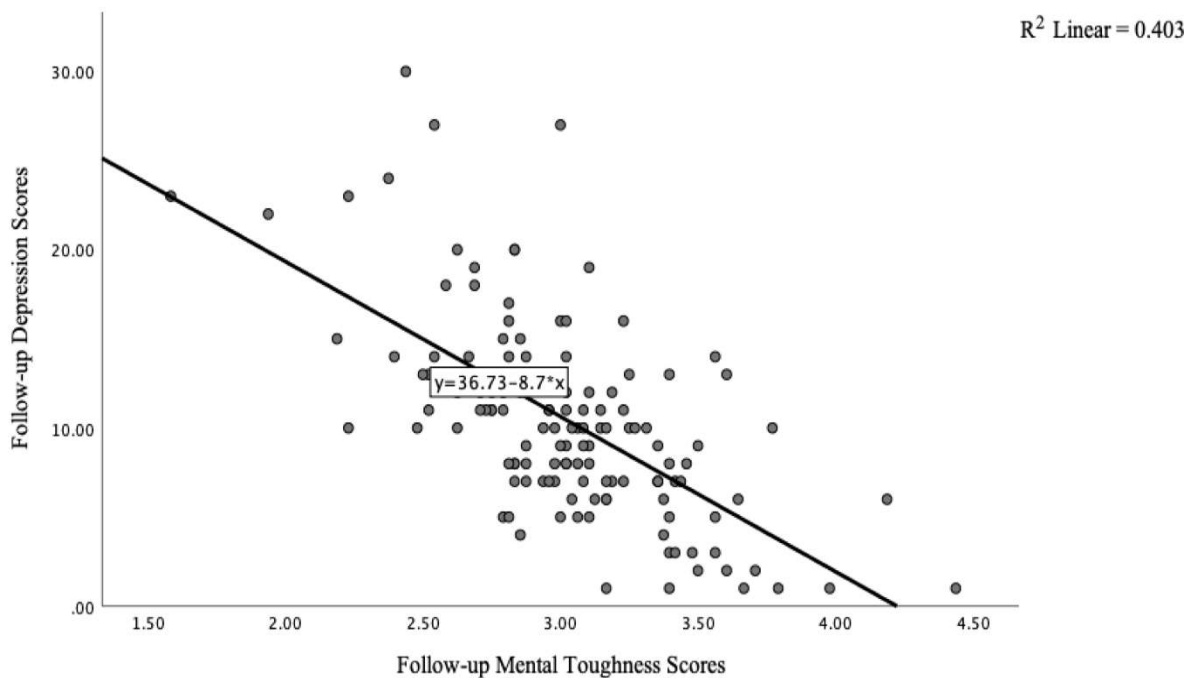


Figure 3. Exploring a Linear Relationship between Mental Toughness and Depression at T2



Figures 1, 2 and 3 show the scattergrams for each correlation. The data points are reasonably well distributed along the regression line in a linear relationship with some outliers. The results shown in Figures 1 to 3 support our first hypothesis that there would be a statistically significant correlation between anxiety and depression, MT and anxiety, and MT and depression.

Table 3

One-Way Analysis of Variance for the Effects of Group on 3 Dependent Variables at T1

Variable and Source	<i>SS</i>	<i>MS</i>	<i>F</i> (1, 132)	<i>p</i>	η^2
Anxiety					
Between	49.653	49.653	.167	.683	.001
Within	39168.802	296.733			
Depression					
Between	2.539	2.539	.094	.760	.001
Within	3572.984	27.086			
Mental Toughness					
Between	.000	.000	.000	.997	.000
Within	17.373	.132			

Table 3 shows the effect of group (experimental, control) on anxiety, depression and MT at T1. These results show no significant effect of group on these three variables and support our second hypothesis that there would be no significant difference between the experimental group and the control group at T1.

Additionally, table 4 shows the effect of group (experimental, control) on anxiety, depression and MT at T2. These results show no significant effect of group on these three variables and do not support our third hypothesis that there would be a significant difference between the experimental group and the control group at T2.



Table 4

One-Way Analysis of Variance for the Effects of Group on 3 Dependent Variables at T2

Variable and Source	<i>SS</i>	<i>MS</i>	<i>F</i> (1, 132)	<i>p</i>	η^2
Anxiety					
Between	11.311	11.311	.035	.852	.000
Within	42947.502	325.360			
Depression					
Between	11.054	11.054	.353	.554	.003
Within	4135.543	31.330			
Mental Toughness					
Between	.002	.002	.013	.909	.000
Within	22.074	.167			

Table 5 shows the effect of time (T) (T1, T2), group (G) (experimental, control) and their interaction on anxiety, depression and MT. These results show a significant effect of time on anxiety and depression. However, there is no corresponding effect of group or of the interaction between time and group on these variables. This means that the effect on anxiety and depression over time was not caused by the WWTRP. In respect of MT, these results report no significant effect of time, group or the interaction between time and group.



Table 5

Analysis of Variance for the Effects of Group and Time on 3 Dependent Variables

Variable	Source	df	SS	MS	F	p	η^2	
Between subjects								
Anxiety	Group	1	6.783	6.783	0.013	0.909	0.000	
	Error 1	132	68634.380	519.957				
	Within subjects							
	Time	1	950.077	950.077	9.302	0.003	0.066	
	T x G	1	54.181	54.181	0.530	0.468	0.004	
Error 2	132	13481.923	102.136					
Between subjects								
Depression	Group	1	12.094	12.094	0.282	0.596	0.002	
	Error 1	132	5662.623	42.899				
	Within subjects							
	Time	1	162.753	162.753	10.501	0.002	0.074	
	T x G	1	1.499	1.499	0.097	0.756	0.001	
Error 2	132	2045.904	15.499					
Between subjects								
MT	Group	1	0.001	0.001	0.005	0.946	0.000	
	Error 1	132	33.407	0.253				
	Within subjects							
	Time	1	0.078	0.078	1.701	0.194	0.013	
	T x G	1	0.001	0.001	0.023	0.880	0.000	
Error 2	132	6.401	0.046					

Figures 4 to 6 show that the levels of anxiety and depression decreased and MT increased between T1 and T2 in both groups, but as shown in Table 5 these effects were not attributable to WWTRP. Consequently, these results do not support our hypothesis that there would be a significant difference between T1 and T2 in the experimental group, but not in the control group.

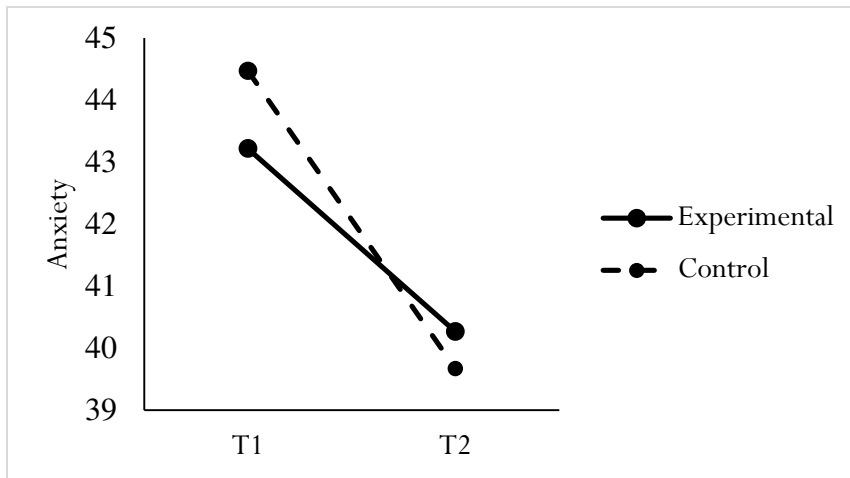


Figure 4. Comparison of Anxiety Mean Scores for 2 Groups and 2 Times

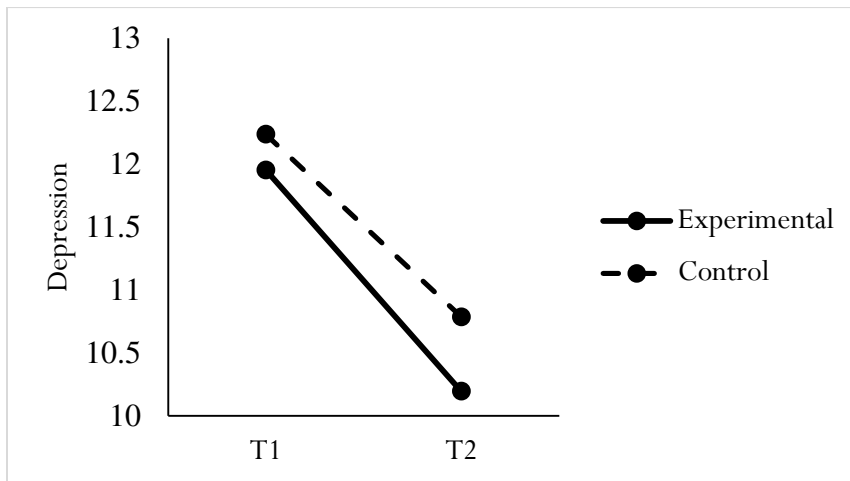


Figure 5. Comparison of Depression Mean Scores for 2 Groups and 2 Times

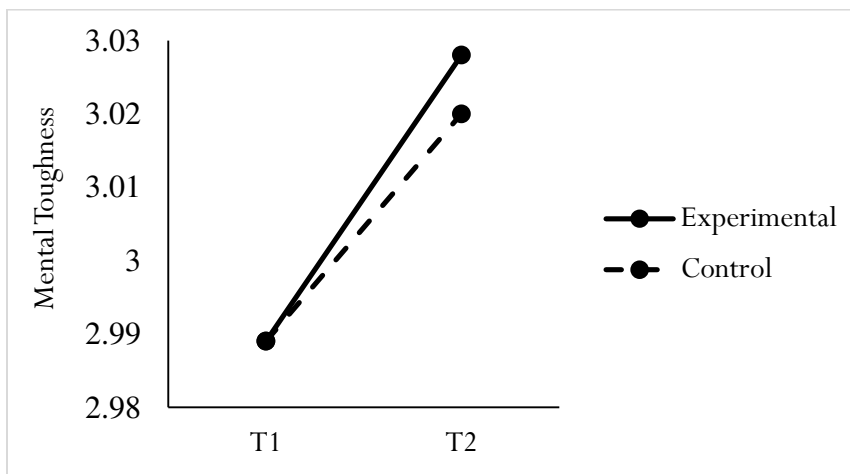


Figure 6. Comparison of Mental Toughness Mean Scores for 2 Groups and 2 Times



Discussion

Our first hypothesis was that there would be a statistically significant correlation between anxiety and depression, depression and MT, and MT and anxiety. We found a strong, positive correlation between anxiety and depression, reflecting the findings reported by Batterham et al. (2013) and Frewen et al. (2013). We also found a strong, negative correlation between MT and depression as demonstrated by Gerber et al. (2013). The strong, negative correlation between MT and anxiety supported previous research that mentally tough individuals have lower anxiety levels (Horsburgh et al., 2009). Given the importance of ensuring that both participant groups were equivalent, our second hypothesis was that there would be no difference between the experimental and control group for anxiety, depression and MT at T1. This was supported by our results and provided a reliable basis for subsequent comparisons between groups. Our third hypothesis was that there would be a significant difference between the control and experimental group for anxiety, depression and MT at T2. However, our results provided no evidence for this hypothesis.

Our fourth hypothesis was that there would be a significant difference between T1 and T2 in the experimental group but not in the control group. There was some confidence in this hypothesis as previous studies of school-based resilience programs have shown small significant decreases in anxiety and/or depression (Barrett et al., 2006; Brunswasser et al., 2009; Challen et al., 2014; Lock & Barrett, 2003; Lowry-Webster et al., 2003; McGrath, 2017; Werner-Seidler et al., 2017). However, our study found no evidence to support this hypothesis. This was disappointing, but not unique, as a study of nine PRP trials also found no evidence of the program reducing anxiety or depression (Bastounis et al., 2016). Still, the body of evidence from previous research allows us to deduce that a future intervention could achieve significant results. Our results for the third and fourth hypotheses were unexpected particularly as hypothesis 1 was supported by a significant correlation between the dependant variables. An explanation is that correlational studies do not explain causality, but simply identify associated characteristics (Field, 2009).

Limitations and Future Directions

A number of limitations were identified. The aim of this study was to show an improvement in the overall mental health in children as a result of teaching the WWTRP. This was based on research advocating resilience programs in schools (WHO, 2005). We assumed that anxiety and depression levels in the study sample were in line with WHO (2017) estimates for the UAE, which are above global averages. However, it is possible the participants already possessed sound mental health and did not require the support of a resilience program. Exposure to different cultures can provide expatriates with the skills to handle change, adapt to new situations and be more open to and accepting of different cultures (Bonebright, 2010; Moore & Baker, 2012). As our sample consisted primarily of expatriates (87%) who experience a transient, multicultural lifestyle, it is possible that they may have already developed strong levels of resilience. Our T1 results, which showed the majority of students did not have elevated levels of anxiety and were not more likely to have a depressive diagnosis suggest this may have merit. Future studies could measure the impact of the WWTRP on individuals already assessed to have elevated levels of anxiety and depression.



The lack of impact could also be due to the length of our study. We delivered six hours of the WWTRP, whereas previous studies implementing the PRP/UKRP delivered between 18 and 24 hours of content. Horsburgh et al. (2009) identified that MT was strongly influenced by genetics and may be difficult to modify, but concluded it was possible for resilience to be developed. Future research where the WWTRP is part of a longer-term study and which targets these components, may deliver better outcomes. The implementation approach for WWTRP may also have influenced results. Students were introduced to different resilience tools in each lesson and were encouraged to apply them in their daily lives to reinforce their learning, without formal engagement from teachers or parents. Accordingly, students may have viewed these lessons as isolated from the rest of their learning experience and this perception may have limited the impact of the program.

Implementing WWTRP as part of a wider PP framework, such as the GGS Model, could lead to greater impact. The 'Learn It' process of GGS Model advocates the 'sharing of opportunities as a whole-school community to understand and engage with the science of wellbeing' (Hoare et al., 2017, p. 60). Future research that provides training for staff and parents on WWTRP, their own personal well-being and the foundations of PP, would allow a common language to be shared and opportunities to reinforce learning within and outside the school environment. This training would allow the next step of the GGC Model to take place, namely 'Live It'; where staff and parents apply the tenets of WWTRP in their professional and personal lives to increase their own wellbeing and be a positive role model to students, a driver in whole-school approaches to fostering positive health (Jennings & Greenberg, 2009). The 'Teach It' process would be enabled through the initial training, where staff could teach WWTRP, both implicitly and explicitly, beyond that carried out by the researcher. This would give students the opportunity to practice and apply the skills in their daily life. Once the WWTRP is taught, it could then become part of a wider whole-school approach that integrates learning across many aspects of school life for sustainable change to occur, namely the 'Embed It' process.

The cognitive maturity of the students may also have affected our results. The WWTRP was designed for Year 5 students; yet, this study was undertaken at the start of the school session, following a nine-week summer break. Conducting the study later in the year may have allowed more time for the students to cognitively mature and settle into classroom routines. This may have provided more receptive conditions for the WWTRP to achieve a greater impact. A delayed implementation may also have assisted in the effectiveness of the MTQ48 scale. It is suitable for completion by students from age 10 and upwards, however using it at the beginning of Year 5 may have been challenging for younger students. We acknowledged this by using the simplified vocabulary option of the scale; however, this may still have been too complex. We considered using the MTQ18, which uses 18 instead of 48 items; but, short scales have significant limitations in generating accurate results (D. Strycharczyk, email, June 27, 2018). As the first experimental study into MT in education, we considered it important to collect as much relevant data as possible. Future studies may wish to use the shorter version or assess the relative merits of both.

Students may also have found it difficult to choose from the five response options in the MTQ48. The SCAS and DRSC had fewer options and the language used may have been easier to understand. The researcher and class teacher supported the students to complete the scales, which



should have limited the possibility for misunderstanding. Finally, the MTQ48 was the last questionnaire to be completed and it is possible that by this time students' levels of concentration could have been affected. This may have resulted in straight-line responding (Lavrakas, 2008) or answering with the middle response; 'Neither Agree, Nor Disagree'. The impact on concentration may have been compounded by the questionnaires taking longer to complete than normal, due to the researcher reading out each question in turn.

By studying the effectiveness of a resilience program on MT in an educational context, this study provides the foundation for future research in this area. We recommend further studies be conducted within the region, which investigate the full spectrum of PPIs in the development of PosEd; particularly experimental research in education to develop PP characteristics such as resilience, using positive measures. We also recommend further studies into the application of PPIs over a longer timescale as part of a comprehensive, whole school PosEd program using a formal framework, such as the GGS model. Previous research has found that interventions promoting mental health are not influenced by factors such as ethnic origin or minority status (Brunswasser et al., 2009; Greenberg et al., 2003; Seligman et al., 2005; Ungar, 2005); yet, Barrett, Sonderegger, and Sonderegger (2001) noted that even successful programs needed to be sensitive to culture. Given the UAE's multicultural context, we recommend that further research be conducted into developing indigenous PP programs and PosEd models specifically for the MENA region, and include the appropriate training and engagement of teachers as well as practitioners.

Conclusion

Our study built on previous research into PP and PosEd in the MENA region (Al-Hattab, 2017; Al-Wakeel, 2010; Al-Yamani et al., 2014; Lambert, Passmore et al., 2019; Lambert, Passmore, Scull et al., 2019; Ramadan, 2014), which focused on increasing positive emotions, flourishing and subjective wellbeing in secondary schools and universities. Previous experimental studies (Barrett et al., 2006; Brunswasser et al., 2009; Challen et al., 2014; Lock & Barrett, 2003, Lowry-Webster et al., 2003; McGrath, 2017; Werner-Seidler et al., 2017) have investigated the impact of resilience programs on anxiety and depression; however, this research has been limited in its scope, scale and approach. Our research focused on decreasing anxiety and depression and increasing mental toughness within a primary school context, seeking to employ PP as a proactive approach to improving mental health and wellbeing at an early stage of child development. While our research findings did not support all our hypotheses, they nonetheless signposted areas where future research can focus and also supported both the WHO recommendations and UAE Government Vision 2021.

Despite the endorsement of the UAE government and popular support from students, teachers and parents, school leaders are still to be convinced of the value of PP to educational attainment. We recommend a comprehensive approach to measuring and publicising the impact of future studies on pupil wellbeing and abilities nationally across the education sector in order to promote the benefits of PosEd; particularly in helping to provide education leaders the data required to evaluate and demonstrate the potential positive return on investment that can be



achieved. Finally, we recommend a greater effort to promote PP and PosEd nationally, reinforced and championed more actively by the UAE government to realise its Vision 2021 outcomes.

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