

THE BENEFITS OF MINDFULNESS ON WELL-BEING AND ACADEMIC
ATTAINMENT IN UNIVERSITY STUDENTSRebecca Cooke¹ and Andrew P. Smith^{2*}¹Centre for Occupational and Health Psychology, School of Psychology.²Cardiff University, 63 Park Place, Cardiff CF10 3AS, UK.

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ABSTRACT

Background Past research has signified that enhancing mindfulness through training positively relates to increased well-being and that greater well-being is associated with better academic performance in university students. The present study investigated whether high natural mindfulness scores are related to greater student well-being and better academic attainment. **Methods** Using an online survey, 345 psychology undergraduate students answered questions on well-being, factors related to well-being (stress, psychological capital, negative coping and social support), mindfulness and academic attainment. Examination and coursework marks were also used to assess academic attainment. **Results** Mindfulness was positively correlated with well-being and the factors related to well-being. No relationship was found between mindfulness and academic attainment, although a negative correlation was found between mindfulness and perceived course stress and a positive correlation for work efficiency. These findings suggest that the more mindful students are, the greater their well-being, which may help buffer against the negative aspects of university life.

KEYWORDS: Well-being; Mindfulness; Academic attainment; University students; Stressors; Social support; Negative coping; Psychological capital; Course stress; Work efficiency

INTRODUCTION

The term well-being covers a wide range of things. The Oxford Dictionary defines well-being as "The state of being or doing well in life; happy, healthy, or prosperous condition; moral or physical welfare." It involves not just the person's mood but their overall functioning.^[1] The American Psychological Association.^[2] have defined well-being "as a state of happiness and contentment, with low levels of distress, overall good physical health, mental health and outlook, or good quality of life". The WHO.^[3] has defined positive mental health as "a state of well-being in which the individual realises his or her abilities, can cope with the everyday stresses of life, can work productively and fruitfully, and can contribute to his or her community." Well-being has different dimensions; various types have been identified - subjective, objective, psychological, and emotional well-being. There is no specific definition for subjective well-being. Still, it has been described as a broad category of phenomena, including people's positive and negative emotional responses, judgements of overall life satisfaction and contentment in particular areas of life.^[4]

Traditionally, well-being has been defined as the absence of ill health, depression, anxiety and stress, and the

emphasis on these mental health issues stems from the fact that they account for the vast numbers of lost working days.^[5,6] Despite the focus on mental health problems, well-being is not the absence of mental illness.^[7] and positive well-being is now also considered an important element of well-being.^[6] Over the last several decades, there has been a substantial increase in interest in subjective well-being due partly to a societal drift in placing more importance on subjective views in evaluating life.^[4]

It has now been established that those objective social indicators, such as crime rates, socio-economic status and education, are relevant to the quality of life, but in addition, the subjective element is also vital; the majority of university students consider happiness and life satisfaction to be more important than money.^[8]

Well-being can be influenced in multiple ways in many populations, and this study will concentrate on examining the well-being of university students and the factors that affect it, as adjusting to university life can be challenging.^[9] Much research has been conducted on this topic, examining many components that may influence students' well-being and, in turn, academic attainment. It

has been found that students who engage in problem-focused coping are more likely to be motivated and perform better than students who engage in emotion-focused coping.^[10] In addition, support from parents, but not from friends or romantic partners, significantly predicts the grade point average.^[11] Mental illness, such as depression, is a significant predictor of lower academic attainment and a higher probability of dropping out, particularly among students who also have a diagnosis of an anxiety disorder.^[12]

Strobel, Tumasjan and Spörrle.^[13] found that people with positive personalities (low in neuroticism and high in extraversion, openness, and conscientiousness) were predisposed to being more satisfied with their life and were also higher in self-efficacy, further increasing life satisfaction. Finally, low life satisfaction and high levels of distress directly influence student performance and mediate the association between academic work control and performance.^[14,15] Factors such as social support, psychological capital, negative coping and stress are associated with and can be used to predict people's well-being. The research above highlights that studying student's well-being is essential. It enables researchers to identify factors that negatively affect it and help students overcome them to enhance their university experience and reduce dropout rates.

The Well-being Process model involved more concepts than the subjective well-being outcomes of positive affect, happiness, and life satisfaction.^[16] It included negative outcomes such as anxiety, depression and stress. Research has shown that different types of brain activation produce positive and negative emotions and are not the endpoints of a single process. The Well-being Process Questionnaire.^[17,18] was developed from the DRIVE (Demands Resources Individual Effects) stress model.^[19,20] This model was initially used with occupational samples but then used in education settings. Additional predictor and outcome variables were added to the survey. Initially, the DRIVE model focused on predictors of mental health, such as demands, resources (support and control), and individual factors, such as coping styles. The Well-being Process Questionnaire (WPQ) included more predictor variables (e.g. psychological capital) and positive outcomes (happiness, life satisfaction and positive affect). There is now extensive research using the Well-being Process Questionnaires with students.^[21-32], and these studies have generally replicated the effects of the established predictors and added new predictor variables (e.g. workload, work-life balance, flow, and daytime sleepiness) and outcome variables (e.g. flourishing and physical health).

Mindfulness is an attribute of consciousness long believed to promote well-being and has been defined as being attentive to and aware of what is taking place in the present.^[33] Contemporary psychology has adopted mindfulness as an approach for helping people become

more aware of and respond more skilfully to emotional distress and adaptive behaviour.^[34] Individuals disengage from unhealthy behaviours/ habits and anxious thoughts/fantasies about the future by concentrating on the present, enhancing well-being.^[33] This has been demonstrated by Brown and Ryan.^[33] who found that high scorers on the Mindful Attention Awareness Scale (MAAS) were more aware of and receptive to inner experiences, more mindful of their overt behaviour and more 'in tune' with their emotional states. In addition, they were less likely to be self-conscious and socially anxious and were associated with greater positive affect and less frequent and intense negative affect. These findings highlight that mindfulness as an attribute may predict well-being outcomes.

While mindfulness can be considered a personal characteristic, it is also a skill a person can learn and develop to improve their well-being. Mindfulness-based stress reduction (MBSR) training, a structured group program easing suffering associated with physical, psychosomatic and psychiatric disorders by employing mindfulness meditation, is one method used to increase mindfulness.^[35] Originally, the popularity of MBSR grew without rigorous evaluation, although many randomised controlled studies have since emerged.^[34] Kiken and Shook.^[36] examined the relationship between mindfulness and positive and negative thoughts. Participants who participated in a mindful induction listed fewer negative thoughts when negative images were shown than the control group. No difference was found in the number of positive thoughts between the two groups, indicating that mindfulness may attenuate negative thoughts but not thoughts that emphasise positivity. Grossman et al.^[35] conducted a meta-analysis on MBSR training. Despite the fact relatively few studies were analysed, results indicated that MBSR may help a broad range of individuals cope with clinical (e.g., pain, cancer, heart disease, depression, and anxiety) and non-clinical problems. Furthermore, mindfulness has been incorporated into other types of therapy, such as mindfulness-based cognitive therapy (MBCT), a group intervention designed to train disengagement from depressive thinking that may mediate the recurrence of the disorder.^[37] Research has, therefore, shown that mindfulness training successfully aids those with clinical and non-clinical problems.

Recent studies have highlighted some pathways explaining why increased mindfulness benefits subjective well-being. Creswell et al.^[38] indicated that mindfulness meditation training is beneficial for improving resting-state functional connectivity (rsFC) of brain regions that are associated with executive control (the Executive Control Network, E.C.). This, in turn, is associated with behavioural improvements in executive task performance, such as attention and task switching. Another study by Taren et al.^[39] investigated the association between the amygdala, a cell complex centrally involved in processing psychological stressors

and the coordination of physiological stress responses and mindfulness. Findings indicate that perceived stress was associated with the greater amygdala (subgenual anterior cingulate cortex, sgACC) resting state functional connectivity, which was reduced after mindfulness meditation training. This suggests that mindfulness may aid the reduction in amygdala activity when coordinating the physiological stress responses, therefore decreasing the stress response.

Research by Bennet and Dorjee.^[40] highlighted the growing interest in developing mindfulness skills in education to improve psychological well-being in children and adolescents and develop work-related skills and performance. The study, conducted on 16 - 18-year-old sixth-form students, found medium-sized effects on depression and anxiety scores, with students on mindfulness-based training scoring lower than the control group. In addition, a medium-sized effect on academic attainment was found with students in the training group achieving better grades. A similar study by Sanger and Dorjee.^[41] again conducted on sixth-form students, used EEG to measure brain activity during an oddball task (participants had to respond only when they saw a target stimulus appear). It was found that mindfulness training was associated with significantly more pronounced N2 negativity linked to selective attention. In addition, participants in the control condition had more post-test concentration lapses and relied on worry-based motivations to work compared to students who completed the mindfulness training. Findings like these imply that increasing mindfulness through training positively relates to psychological well-being, increased selective attention and academic attainment in sixth-form students.

Studies on university students have shown that natural mindfulness practice may help to buffer some of the negative stressors associated with university.^[9] A survey by Palmer and Rodgers.^[9] on university students revealed a significant negative correlation between mindfulness and perceived stress and a significant positive correlation between rational coping style and mindfulness. These findings support the idea that mindfulness may increase a person's ability to cope with stress, given that participants with a high level of mindfulness scored significantly lower on the perceived stress score.

The present study follows a similar design to the Palmer and Rodgers paper, as a cross-sectional survey-based design was used to investigate mindfulness measured as a personal trait and its relationship with well-being in university students. However, alterations were made to expand on previous findings. This study looked at the relationship between mindfulness and stress and the associations between mindfulness and other predictors of well-being, such as positive personality, negative coping, social support and well-being, measured via the Well-Being Process Questionnaire (WPQ). Well-being is multifaceted, leading to complexity during the

assessment. However, the WPQ overcomes this by using single-item measures relating to different aspects of well-being. Moreover, academic attainment was studied to determine if it was associated with mindfulness, and it was assessed using students' average module marks for the first semester, which consisted of coursework and exam grades. Other aspects related to academic attainment, such as course stress, work efficiency and personality traits, were also measured in the survey.

This investigation used a much larger sample size than the Palmer and Rodgers.^[9] study, enabling the detection of small to medium effect sizes. This investigation was based on the Five Facet Mindfulness Questionnaire (FFMQ), which Baer, Smith, Hopkins, Krietemeyer, and Toney created to measure participants' mindfulness.^[42]

Previous mindfulness questionnaires, such as the Mindful Attention Awareness Scale (MAAS), may cover different elements or facets of mindfulness. Baer et al.^[42] suggested that the most useful measures cover all relevant aspects of mindfulness separately and reliably. Their research indicated that mindfulness is a multifaceted construct with five distinct facets represented individually by previous mindfulness questionnaires. Four aspects, describe, act with awareness, non-judgemental and non-reactivity, were consistently related, whereas the facet 'observe' correlations were in the unexpected direction. An explanation for this is that mindfulness can be considered a skill, and therefore, changes in meditation experience may help develop the 'observe' facet.^[42] Despite this, a shortened version of the FFMQ was used in this current study, considering mindfulness as multifaceted.

Studying the relationship between mindfulness and students' well-being is a worthwhile endeavour, as it will further aid our knowledge on how to enhance student's university experience positively. The wide range of research on mindfulness provides solid evidence that it positively affects well-being and other related factors by reducing stress, depression, and anxiety and aiding in positive coping. It has also been found that increasing mindfulness through training positively relates to better academic attainment in sixth-form students.^[40,41] Many past inquiries have examined the effects of enhancing mindfulness through training. In contrast, this present investigation aims to explore mindfulness as a personal characteristic in university students and expands on the findings of Palmer and Rodgers.^[9]

One hypothesis for this study is that mindfulness and the predictors of well-being will be associated; students with greater mindfulness scores will be less stressed, engage in less negative coping, have positive personalities and have more social support. The focal hypothesis for this study is that students who score highly on the FFMQ will have better overall well-being scores, consequently predicting better academic attainment than less mindful students.

MATERIALS AND METHODS

Ethical committee approval

The Ethical Committee of the School of Psychology, Cardiff University, approved this current study, and all participants consented to volunteer (ethics reference number, EC.15.11.10.4284R). All were debriefed after the survey was completed and provided the details of the researcher, supervisor, and ethics committee should they want to contact us regarding this study. Volunteers were recruited via the EMS system from Cardiff University's psychology student population and informed that the study investigated mindfulness's effects on well-being and academic attainment.

Participants

Three hundred and forty-five (38 males and 307 females) first and second-year Cardiff University undergraduate psychology students completed this study. This sample size was big enough to detect small to medium effect sizes. There was an even split between the years, as 48.4% of participants were in the first year and 51.6% in the second year. The age of participants ranged from 18 to 48 years; 97.1% of participants were 23 years of age and under. The percentage of participants who went to a private school was 20.9%, and 79.1% went to a state school. Course credits were given for participation. All participants consented before completing the survey.

MATERIALS

Participants completed an online survey containing questions about well-being and student lifestyle factors.

Well-being questions

The Well-Being Process Questionnaire (WPQ).^[18] was used, which comprised questions relating to the predictors of well-being and measures relating to well-being outcomes. The predictors of well-being included seven questions relating to student life experiences (ICSRLE), three about student social support, four on psychological capital and three on negative coping style. This questionnaire measured multiple aspects of well-being and allowed many variables to be measured in less space and time.^[18] To answer the questions about student life experiences, participants were provided with an explanatory statement instructing them to indicate to what extent certain elements of student life applied to them. For example, 'challenges to your development' and 'academic dissatisfaction' were rated out of 1 (not at all part of my life) to 10 (very much part of my life). Examples of questions on social support, psychological capital, and negative coping style are: 'There is a person or people in my life who would provide tangible support for me when I need it', 'In general, I feel optimistic about the future', and 'When I find myself in stressful situations, I blame myself'. Participants answered these questions by rating on a scale of 1 (Disagree strongly) to 10 (Agree strongly). Well-being outcome measures included questions on life satisfaction, depression, positive affect, negative affect, anxiety, life stress, physical fatigue, mental fatigue and happiness. All

questions were answered by rating on a scale of 1 (Disagree strongly/ Not at all/Not at all depressed/Not at all anxious/Not at all stressful/Extremely unhappy) to 10 (Agree strongly/Extremely depressed/Extremely anxious/Very stressful/Very often/Extremely happy).

Mindfulness questions

This study used a shortened Five Facet Mindfulness Questionnaire (FFMQ) version.^[42] The questionnaire was originally 39 items long, split into five sections representing the five facets of mindfulness: observing, describing, acting and awareness, non-judging and non-reactivity. The 39 original items for each facet of mindfulness were condensed to create 1 item for each facet. In total, the reduced FFMQ was five items long. This was done, as the original FFMQ would have been too long and taken too much time to complete. Participants stated how much they agreed with each of the items on a scale of 1 (Not at all) to 10 (Very often). The *observing* question was, 'I am able to observe and pay attention to things around me (e.g. sounds, aromas and visual elements) and am aware of my bodily sensations (e.g. I pay attention to the wind in my hair or sun on my face).' The *describing* question was, 'I am able to find the right words to describe and express my feelings, beliefs, opinions and expectations.' For the *acting and awareness* facet, the question used was, 'I am able to attend, focus and concentrate on the task at hand as it is in the present moment, and I am not easily distracted by daydreaming or worrying.' The *non-judging* question was, 'I judge myself, my thoughts, and the emotions I feel fairly and do not criticise or disapprove of myself even if I have irrational or inappropriate ideas.'

Finally, the question used for the *non-reactivity* facet was, 'I am able to perceive my feelings and emotions without having to react to them, even if I have distressing thoughts or images; I can step back and just let them go.'

Academic attainment

Anonymised electronic records of participants' examination and coursework marks were used to measure academic attainment; A-level results were also obtained. Other factors related to academic attainment were measured via questions relating to participants' perceptions of course stress and how efficiently they do their university work. Answers to these two questions were measured on a scale of 1 (Not at all stressful/Not at all efficiently) to 10 (The most stressful it could be/Extremely efficient).

Personality

The Big Five personality traits, openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism, were measured, and participants answered these questions on a scale ranging from 1 (Disagree strongly) to 10 (Agree strongly). An example of a personality trait question related to agreeableness is as follows: "I feel that I have an agreeable nature (for

example, I feel sympathy toward people in need, I like being kind to people, I'm cooperative)".

Design

A cross-sectional survey-based study was used. The predictors of well-being (stressors, student social support, positive personality and negative coping style), overall well-being, academic attainment factors relating to academic attainment (personality traits, perceived course stress and work efficiency) and the mindfulness scores were recorded.

Procedure

Participants signed up to participate in the online study via the EMS system and were then required to complete the survey in their own time. Before answering the survey, participants read an instruction page and consent form on the computer, consented to participate, and completed the 45-minute online survey. Questions measured individual differences (such as age, gender, university year, etc.), overall well-being variables, predictors of well-being, the five big personality traits and specific aspects of the student's lives, e.g. diet, exercise, mindfulness, etc. The questions relevant to this study were about mindfulness. After completion, participants were debriefed about the nature of the study and course credits were awarded.

RESULTS

Derived scores

The scores for the predictors of well-being (e.g. stressors, social support, negative coping and psychological capital) were derived by totalling the answers to the corresponding questions. The total well-being score was the sum of the positive items + the sum of the reversed scored negative items. The big five personality traits were the sum of the positive questions and reversed-scored negative items. The mindfulness

total score was the sum of the five items on the shortened FFMQ. The academic attainment variables were split into three categories: Mod = average module mark, Ex = average exam mark and Cw = average coursework mark. Two questions were also used to measure how stressful and efficiently students find/do their work.

Missing Data

Some participants did not complete all aspects of the survey, which explains why the *N* value varies in the analysis. The program (SPSS) used to analyse the data addresses missing data, so no participants were excluded from the data set.

Well-being and the Predictors of Well-being

A Pearson correlation was conducted on the four predictors of well-being to identify their relationship with actual well-being. All four predictors were significantly correlated with actual well-being scores. The stressors ($r(335) = -.523, p < .01$) and negative coping ($r(337) = -.539, p < .01$) predictors were negatively correlated with well-being. In contrast, social support ($r(336) = .414, p < .01$) and psychological capital ($r(332) = .731, p < .01$) were positively correlated with well-being. According to Cohen^[43], strong correlations were found between well-being and stressors, negative coping and cheerful personality, and a medium correlation was found with social support.

Total Mindfulness Score and the FFMQ Items

Strong significant correlations were found after a Pearson correlation was conducted between the total mindfulness score and the five individual facet questions. Moreover, there were significant positive correlations between all of the five facets of mindfulness, apart from the facets observed and non-judging, as no significant correlation was found (see Table 1 for full details).

Table 1: Pearson correlations between the five facets of mindfulness and the total mindfulness score. Correlation Coefficients.

	O	D	AA	NJ	NR	TMS
O	1	.357**	.189**	.079	.186**	.524**
D		1	.364**	.175**	.242**	.653**
AA NJ NR			1	.274**	.344**	.676**

Notes: *N* = 343, O = Observe, D = Describe, AA = Acting and Awareness, NJ = Non-Judging, NR = Non-Reactivity, TMS = Total Mindfulness Score

** $p < .01$

Well-being, Predictors of Well-being and Mindfulness

A Pearson correlation examined the relationship between the total mindfulness score and the predictors of well-being and found significant results for all four predictors. A weak negative correlation was found between mindfulness and stressors, and medium correlations were identified between mindfulness and negative coping and social support. A large positive correlation was found between mindfulness and psychological capital. (see

Table 2 for more details). Each of the individual mindfulness facets was significantly correlated with the well-being scores: observe ($r(337) = .120, p < .05$), describe ($r(337) = .286, p < .01$), acting and awareness ($r(337) = .390, p < .01$), non-judging ($r(337) = .361, p < .01$) and non-reactivity ($r(337) = .383, p < .01$).

Table 2: Pearson correlations between the total mindfulness score and the predictors of well-being and the mean and standard deviation for the total mindfulness score. Descriptive Statistics Correlation Coefficients.

	M	SD	S	PC	SS	NC
TMS	30.40	6.26	-.176**	.517**	.329**	-.329**

Notes: N's range from 337 to 342 due to occasional missing data. M = Mean, SD = Standard deviation, TMS = Total Mindfulness Score, S = stressors, P.C. = Psychological Capital, S.S. = Social Support, NC = Negative coping.

** $p < .01$

A Pearson correlation between well-being scores and overall mindfulness scores revealed a significant medium relationship; See **Figure 1**. When the predictors of well-being were controlled for, in a partial correlation, the

relationship between well-being and mindfulness was weakened but remained significant ($r(319) = .149, p < .05$).

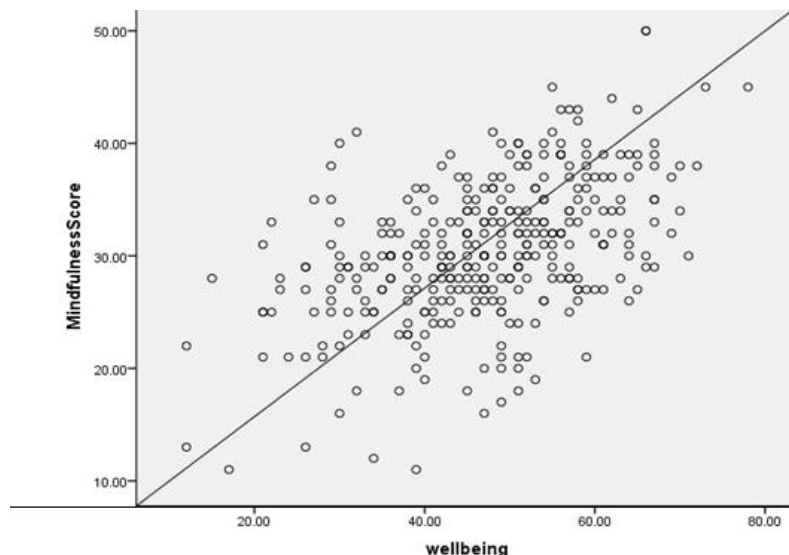


Figure 1: Scatter graph highlighting the medium, positive correlation found between well-being scores and the total mindfulness scores ($r(337) = .488, p < .01$); as the mindfulness scores increase, so do the well-being scores.

After conducting a multiple regression analysis, results highlight that stressors, negative coping, social support, psychological capital and mindfulness explained significant variance in well-being scores ($R^2 = .677, F(5, 319) = 133.72, p < .01$) (see **Table 3** for further details). Three mindfulness groups, low, medium, and high, were formed during the analysis based on the participants' mindfulness scores. The low mindfulness group included scores that were lower than the total mindfulness score mean minus one standard deviation ($Low < M - 1 S.D.$), the medium mindfulness group was made up of participants whose scores were between the mean plus/minus one standard deviation ($Medium = +/- 1$

$S.D.$) and the high mindfulness group were mindfulness scores that were higher than the mean plus one standard deviation ($High > M + 1 S.D.$; see **Table 2** for the mean and standard deviation for the mindfulness score). A one-way ANOVA was conducted on the different mindfulness groups and well-being scores, revealing a significant effect. See **Figure 2** for details. A post hoc comparison using the Tukey test indicated that the mean well-being scores for the low ($M = 37.57, S.E. = 1.216$), medium ($M = 46.40, S.E. = 0.455$) and high ($M = 56.68, S.E. = 0.987$) mindfulness groups were all significantly different from one another.

Table 3: Results for multiple regression: Stressors, negative coping, social support, positive personality, and mindfulness scores all significantly predict well-being scores.

Model	Unstandardised	Coefficients	Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	35.754	3.822		9.355	.000
Stressors	-.311	.046	-.239	-6.749	.000
Negative coping	-.613	.097	-.230	-6.347	.000
Social support	.206	.069	.106	2.999	.003
Psychological	1.069	.096	.458	11.119	.000
Mindfulness	.197	.073	.103	2.695	.007

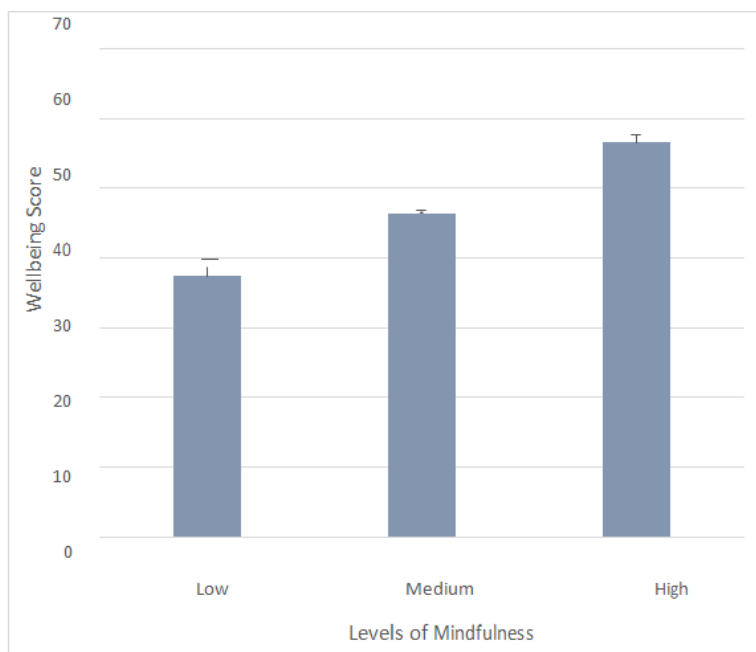


Figure 2: Bar graph highlighting a significant effect of mindfulness on well-being across the low, medium and high mindfulness conditions ($F(2, 334) = 37.91, p < .01$). Standard error shown as bars.

A one-way ANCOVA was conducted, and results found a significant effect of mindfulness scores on well-being scores when controlling for stressors, negative coping, positive personality and social support ($F(2, 318) = 4.18, p < .05$).

Well-being, Mindfulness and Academic Attainment

Participants' average coursework marks, examination marks and overall module marks were used during this analysis. No significant correlations were found between well-being and overall module mark ($r(338) = .05, p = .361$) or between mindfulness scores and overall module mark ($r(343) = -.088, p = .104$). No correlation was found between mindfulness scores and coursework marks ($r(343) = -.035, p = .523$) or examination marks ($r(338) = -.062, p = .250$). Furthermore, no correlation was obtained between mindfulness and A-level scores ($r(283) = .071, p = .234$). However, there were some weak correlations between mindfulness and certain factors relating to academic attainment. Mindfulness was significantly negatively correlated with perceived course stress ($r(343) = -.173, p < .01$) and was significantly positively correlated with student perception of how efficiently they do their work ($r(343) = .18, p < .01$).

In addition, mindfulness was weakly correlated to two personality traits, agreeableness ($r(338) = .175, p < .01$) and conscientiousness ($r(340) = .188, p < .01$), which were both associated with academic attainment in this study. Agreeableness was positively correlated with participants' overall module total ($r(339) = .130, p < .05$) and conscientiousness was also positively correlated with participants' overall module total ($r(341) = .242, p < .01$). The other three personality traits were also significantly related to mindfulness. There was a medium negative correlation for negative affectivity

(neuroticism) ($r(336) = -.435, p < .01$), a medium positive correlation for extraversion ($r(340) = .334, p < .01$) and a weak positive correlation for openness ($r(343) = .149, p < .01$).

DISCUSSION

This survey's results confirm previous research findings and partly support this study's hypothesis. It was found that mindfulness measured as a trait and well-being were positively related, which was still the case when stressors, psychological capital, negative coping and social support were statistically controlled. The high mindfulness score group had higher well-being scores than the low and medium mindfulness groups, indicating that low mindfulness scores may be a risk factor for reduced well-being. Therefore, the more mindful students were, the greater their subjective well-being. This finding could somewhat be explained by the fact that the mindfulness scores were also related to the predictors of well-being, supporting the first hypothesis of this study and replicating findings from past research.^[9, 33] Students with increased trait mindfulness were more likely to have subjective views that they have high psychological capital, engage in less negative coping, have better social support and have less stress. Although these predictors can partly explain the relationship between mindfulness and well-being, they cannot completely explain it. A weak relationship remained when stressors, psychological capital, negative coping and social support were controlled for. This highlights that mindfulness in students may be positively associated with well-being and help buffer against the negative aspects of university life.

Findings revealed no relationship between well-being and academic attainment or between mindfulness and academic attainment, which goes against the hypothesis

stated for this study. Students' overall module marks, exam marks and coursework marks were used to measure academic attainment, and not one of the three was related to well-being or mindfulness scores. No relationship was found between mindfulness and A-level scores also. Previous research has found a relationship between academic attainment and mindfulness when mindfulness was improved by MBSR training.^[40,41] This result could signify that when mindfulness is measured as a trait, it is unrelated to a student's academic attainment. Still, when developed and enhanced as a skill through training, the association between the two occurs. Regardless, mindfulness was associated with certain factors relating to academic attainment. A negative correlation found during analysis implied that more mindful students have less perceived course stress, and a positive correlation indicated that they perceive themselves to be more efficient when completing their work. In addition, mindfulness scores were positively related to two personality traits, agreeableness and conscientiousness, which were positively associated with academic attainment in this study. Mindfulness was also negatively associated with neuroticism and positively related to openness and extraversion. Consequently, trait mindfulness may not directly relate to academic work, such as coursework and exams. Still, it may benefit the educational side of the university in alternative ways by creating a more positive experience and better constructive practice for students.

An important finding is that the five items used on the shortened version of the FFMQ (representing the five facets of mindfulness) were all strongly related to the overall mindfulness score, signifying that the total mindfulness score measured the different aspects of the participant's mindfulness. This highlights that this study recognised and considered the fact that mindfulness is a multifaceted construct. In addition, significant associations were found between the five facets, apart from observation and non-judging. These results confirm previous findings.^[42] and indicate that the shortened version of the FFMQ correctly measures mindfulness. Future investigations could be conducted to explore the consistency between the original, longer version and the shorter, condensed version used in this present study. If the two produce the same results, then the reduced FFMQ could be used in extensive surveys for practicality instead of the lengthier version.

A final point regarding the results is that mindfulness could be considered another predictor of well-being, as the relationship between the two is significant even when the other predictors of well-being were controlled for. Results from multiple regression also indicate that stressors, negative coping, social support, psychological capital, and mindfulness scores significantly predict well-being. Mindfulness could be viewed in the same light as stressors, psychological capital, negative coping and social support for students' overall well-being. For example, previous research has found that students with

increased stressors and negative coping and those lacking in social support and psychological capital are all related to a decrease in well-being. Likewise, findings from this current study follow a similar pattern, as students with low trait mindfulness had lower well-being scores. This highlights the idea that trait mindfulness may also be a valuable aspect to study in future research when measuring factors associated with well-being.

This study supports the adaptive qualities of mindfulness and signifies that greater mindfulness is a valuable trait to have as a university student. It is not only linked to better well-being but is also related to certain aspects of academic attainment. An explanation is that mindful students may attenuate negative thoughts.^[36] and disengage from unhealthy behaviours, habits, anxious thoughts, and fantasies related to the future, leading to well-being enhancement.^[33] This could explain why mindful students in this study were likelier to have greater life satisfaction and psychological capital and were less likely to be stressed and engage in negative coping. Enhancing mindfulness through MBSR training in the student population, especially those who have low trait mindfulness, could be one way to improve student's university experience.

Many studies have highlighted the benefits of mindfulness training in varying populations, such as unemployed adults,^[38,39] sixth-form students,^[40,41] and adults suffering from clinical and non-clinical problems.^[35] These studies found that mindfulness training was associated with better attention, behavioural improvements in executive task performance and reduced depression and anxiety scores. Similar results could be found if mindfulness training was made more readily available and its benefits were more widely known to university students. However, there is the issue that some students may not be motivated to participate in such training. A way to overcome this concern would be to incorporate short (10/15 minutes) mindfulness sessions into compulsory lectures at the beginning of each semester to inform students about the benefits of mindfulness training. Alternatively, all students could complete a well-being questionnaire at the beginning of each semester, and universities could use the results to target students who have low mindfulness scores and negative personalities, use negative coping strategies, have high-stress levels, and have low overall well-being scores. These students could be offered MBSR training to improve their well-being. Increasing awareness of such training may help students get the most out of their university experience by enhancing their well-being and aiding their ability to meet the demands of further education.

An alternative way to deliver training is using computers. A recent study examined the effects of internet-delivered mindfulness training on stress, coping, and mindfulness in university students. Messer, Horan, Turner and Weber^[44] compared mindfulness training with relaxation training,

both delivered via the Internet during a time and at a place of participants choosing. Results highlighted that mindfulness can be taught online and effectively reduces stress and aids students' coping skills by reducing emotion-focused coping. Relaxation training was also found to reduce stress but did not improve coping. Implications of this result are essential, as online mindfulness training is cost-effective and convenient, especially for university students who regularly use the Internet.^[44] This method of mindfulness training could help target specific students who would benefit from such an intervention and may also enhance participation.

Despite the alterations in this current study to expand on past research, it still suffers from methodological issues. One limitation is that a correlational survey-based design was used, so causal inferences cannot be made. As there was no manipulation of the independent variable on the dependent variable, it is not appropriate to say that mindfulness causes better well-being. However, a relationship between the two can be reported. Moreover, from this correlational study, it is unclear which variable influences the other. For example, mindfulness may affect a student's well-being, but it could also be vice versa. It could be suggested that students with better well-being have less anxious thoughts and can be more mindful. On the other hand, previous research, which has manipulated mindfulness by enhancing it through MBSR training, has shown that mindfulness does influence well-being and the predictors of well-being, such as stressors and negative coping.^[35, 39]

A final limitation of this study is that students were not screened for previous involvement in mindfulness training. This study examined mindfulness as a personal trait, but some students who scored high on the FFMQ may have undergone some training in the past, enhancing their original mindfulness levels. Therefore, suggesting that more mindful people have greater well-being may not be plausible. However, due to the large sample size, it is unlikely that all students who scored high on mindfulness had previous training. In a future study, this variable could be considered, as a survey question could ask participants if they have had any experience with mindfulness training.

A way to develop the present findings would be to look at the association between well-being and mindfulness in students across various degree courses to determine if the relationship remains in other student samples. Additionally, future research could assess the well-being/mindfulness relationship throughout the academic year (during study leave, exam times, etc.) to determine whether the association between the two variables remains significant. The present study was cross-sectional, so it is only possible to gain insight into the relationship between mindfulness and well-being at one point. However, analysing the relationship using a prospective study design would enable us to determine whether it stays constant during these different times. It

could be speculated that trait mindfulness and well-being changes would reflect one another. For example, if a student's mindfulness decreased during a specific period, their well-being could be expected to decrease. If this was true, more work could be done to help promote mindfulness during periods when it reduces to maintain greater well-being.

The significant associations found in this present study between trait mindfulness and well-being and the established factors that predict well-being further support the idea that mindfulness has many benefits that can be utilised in the student population. Increased mindfulness was not only related to higher life satisfaction, lower stress, psychological capital and reduced negative coping, but was also correlated to certain aspects related to academic attainment, such as perceived course stress and work efficiency. The results suggest that more mindful students will be more likely to have enhanced well-being naturally, leading to a more positive university experience.

CONCLUSION

Previous research has found that enhancing mindfulness through training leads to increased well-being and that greater well-being is associated with better academic performance in university students. The present study investigated whether high natural mindfulness scores were related to greater student well-being and better educational attainment. An online survey of 345 psychology undergraduate students was carried out. They answered questions about well-being, well-being predictors (stress, psychological capital, negative coping and social support), mindfulness, and academic stress and efficiency. Exam and coursework marks were used to assess academic attainment. Mindfulness was positively correlated with well-being and the factors related to well-being. No relationship was found between mindfulness and academic achievement, although mindfulness was negatively correlated with perceived course stress and positively correlated with work efficiency. These findings suggest that more mindful students report greater well-being, which may help buffer against the negative aspects of being a university student.

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