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Running to well-being: A comparative study on the impact of exercise on the physical and mental health of law and psychology students

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10.1016/j.ijlp.2016.05.012

This is an Author's Accepted Manuscript of: Skead, N. K., & Rogers, S. L. (2016). Running to well-being: a comparative study on the impact of exercise on the physical and mental health of law and psychology students. *International journal of law and psychiatry*, 49, 66-74. Available [here](#).

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To cite this article: Skead, N. K., & Rogers, S. L. (2016) Running to well-being: A comparative study on the impact of exercise on the physical and mental health of law and psychology students. *International Journal of Law and Psychiatry*, 49, 66-74.

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Running to Well-Being:**A Comparative Study on the Impact of Exercise on the Physical and Mental Health of Law and Psychology Students****Natalie K Skead and Shane L Rogers****The University of Western Australia, Edith Cowan University**

Abstract

Research indicates that, in comparison to other University students, law students are at greater risk of experiencing high levels of psychological distress. There is also a large body of literature supporting a general negative association between exercise and stress, anxiety and depression. However, we are not aware of any studies exploring the impact of exercise on the mental health of law students specifically. This article reports evidence of a negative association between exercise and psychological distress in 206 law and psychology students. Compared to psychology students, the law students not only reported greater psychological distress, but, in addition, there was a stronger association between their levels of distress and their levels of exercise. Based on the results of this study, we suggest a simple yet effective way law schools might support the mental health of their students.

Keywords: law students, psychology students, mental health, well-being, exercise, emotional distress, physical distress

'I have always believed that exercise is not only a key to physical health but to peace of mind ... Exercise dissipates tension, and tension is the enemy of serenity'

(Mandela, 1995)

1. INTRODUCTION

There is an extensive body of literature confirming that law students report experiencing symptoms of high or very high levels of psychological distress (Kelk, Luscombe, Medlow, & Hickie, 2009). Indeed, while there is evidence that all university students experience psychological distress at rates higher than the general population (Larcombe, Finch, & Sore, 2015; Said, Kypri, & Bowman, 2013; Stallman, 2010), it has been suggested by some that law students experience higher levels of stress, anxiety and depression than other University students, including students undertaking other professional degrees (Leahy et al., 2010; Lester, England, & Antolak-Saper, 2011; Sheldon & Krieger, 2004; Townes O'Brien, Tang, & Hall, 2011; Skead & Rogers, 2015).

Suggested reasons for the particularly high incidence of psychological distress in law students are many and varied. They range from heavy workloads, the tendency for law to attract competitive students, the adversarial nature of the discipline, the traditionally Socratic nature of law teaching, and the often highly competitive and largely unsupportive culture of law school (Skead & Rogers, 2014; 2015).

In recent comparative studies of law and psychology students in the same university, we found evidence of significantly higher levels of self-reported psychological distress in the law student participants compared to population norms, and compared to the psychology student participants (Skead & Rogers, 2014, 2015). These prior studies explored the association between various aspects of student behaviour and psychological distress. A significant difference between the behaviours of the law and psychology student participants was that the law student participants dedicated more time to university work (Skead & Rogers, 2015). In addition, the law student participants reported particularly high levels of external pressures (primarily related to

the perceived competitiveness of the university environment) and internal pressures (typically related to the participants' perfectionistic tendencies) (Skead & Rogers, 2014). Consistent with existing scholarship, and relevant to the current study, we also found that for the law student participants, the self-reported frequency of exercise had a weak negative association (Pearson correlations varying around -.2) with measures of student stress, anxiety and depression (Skead & Rogers, 2014). This negative association between exercise and psychological distress did not come as a surprise. It has long been accepted and recognised that exercise is an important part of keeping both physically and mentally healthy.

In 1899 renowned philosopher, psychologist and physician, William James, stated that 'our muscular vigor will ... always be needed to furnish the background of sanity, serenity and cheerfulness to life...' (James, 1899, p. 502). In the 120 years since, numerous studies have affirmed that exercise is associated with improved well-being. From the mid-1980s in particular the scholarship supporting this phenomenon has grown rapidly (Bray & Kwan, 2006; Brown, Ford, Burton, Marshall & Dobson, 2005; Fox, 1999; Hamer, Stamatakis, & Steptoe, 2009; Morgan, 1985; North, McCullagh, & Tran, 1990; Peluso & Andrade, 2005; Penedo & Dahn, 2005), confirming that exercise can assist in combatting stress, anxiety and depression (Biddle & Mutrie, 2008, Chapter 9; Byrne & Byrne, 1993, p. 566; Craft & Landers, 1998; Fox, 1999, pp. 412-413; Mutrie, 2000; Taylor, 2000; ten Have, de Graaf, & Monshouwer, 2011).

Some research in this regard has involved large, population-based studies (De Moor, Beem, Stubbe, Boomsma, & De Geus, 2006; Hamer et al., 2009; Hassmén, Koivula, & Uutela, 2000; ten Have et al., 2011). For example, both De Moor et al. (2006) and Hamer et al. (2009) reported a negative association between the extent of exercise and psychological distress in samples of over nineteen thousand participants in European

nations. Other studies have focused on particular sectors of the population (for example, Armstrong & Oomen-Early, 2009; Cameron & Hudson, 1986; Doyne, Chambless, & Beutler, 1983; Steptoe, Edwards, Moses, & Matthews, 1989; Sylvester, Mack, Busseri, Wilson, & Beauchamp, 2012).

A number of studies have confirmed the positive correlation between exercise and mental health in University students specifically (Arias-Palencia et al., 2015; Dhurup, 2012; Tyson, Wilson, Crone, Brailsford, & Laws, 2010; Molina-García, Castillo, & Queralt, 2011). This includes specific types of University students, such as first year students (Bray & Kwan, 2006), nursing students (Hawker, 2012), athletes and non-athletes (Armstrong & Oomen-Early, 2009). Despite the high levels of psychological distress reported to be associated with law school, we are not aware of any existing studies focusing on the impact of exercise on the mental health of law students.

While the precise reasons for the psychological benefits of exercise are not certain, several potential explanations have been suggested. These include the social interaction and mutual support resulting from participating in team sports or group exercise (Peluso & Andrade, 2005, p. 62); the improved mood, self-confidence and self-esteem resulting from engaging in challenging physical activity (Biddle & Mutrie, 2008, Chapter 8; North et al., 1990); and the distraction that physical activity provides from day-to-day stressors (Morgan, 1985). Other suggested reasons range from the sense of autonomy that comes from self-selecting the exercise and doing it voluntarily and solely in one's own interests and the importance of the effort expended in exercising to self-satisfaction, to the improved sense of relatedness created by engaging in physical activities with others (Deci & Ryan, 2002; Sylvester et al., 2012, p. 145).

Underlying all of these reasons is research that reveals a link between exercise and improved concentration and mood via physical mechanisms such as improved blood

flow, facilitated release of healing hormones and inhibited release of degenerating hormones (Austin, 2014). Regardless of the precise reasons for the association, however, it now seems irrefutable that exercise can be effective in combatting stress, anxiety and depression.

It was with this research in mind that in 2015 the Law School at UWA introduced a free weekly 1-hour *Bootcamp for a Healthy Body and Mind* for all law students and staff (*'Bootcamp'*), in an effort to provide cheap and effective support for student well-being. In tandem with the *Bootcamp* and to fill the void in the research on the impact of exercise on the mental health of law students as a specific group of University students, we conducted an empirical comparative study on the association between exercise and mental health in law and psychology students. This article reports our findings and provides insight into:

- 1) The correlation between exercise and psychological well-being in law students;
and
- 2) The comparative correlations between exercise and psychological well-being in law and psychology students.

2. THE COMPARATIVE STUDY

2.1 Aims

The present study aims to investigate the correlation between self-reported levels of emotional and physical distress experienced by law and psychology students and self-reported frequency of exercise over the course of a university semester. The data we have gathered and analysed provides research-based guidance to both students and universities on simple, cheap and effective strategies to support student well-being.

2.2 Ethics approval

This study complied with the National Health and Medical Research Council of Australia's National Statement on Ethical Conduct in Human Research (2007). Institutional ethics approval for the study was obtained from the UWA Human Research Ethics Office before the study commenced.

2.3 Participants

Participants were 59 law students from UWA and 76 psychology students from Edith Cowan University ('ECU').¹ Twenty-two per cent of the law student participants were 22 years or younger compared with 31% of the psychology student participants and 13% of law student participants were over 30 years old compared with 53% of the psychology student participants. While all of the psychology student participants were in the first year of their psychology course, several had attended University previously and had a University qualification. The law student participants ranged from first to final year, with the majority being in in the later years of their degree. Seventy per cent of the law student participants and 75% of the psychology student participants were female.²

2.4 Methodology and measures

Law and psychology students at UWA and ECU respectively were invited to participate in an online survey towards the end of semester 2, 2015. Participation was voluntary and anonymous, with no identifying information included in the data collection. All

¹ The reason for the survey using students from different institutions is that Natalie Skead is an Associate Professor in the Law School at The University of Western Australia and Shane Rogers a Lecturer at Edith Cowan University. Both universities are located in Perth, Western Australia.

² Due to the disproportionate number of female participants, caution should be exercised in extending the findings of the survey to male law and psychology students.

participants consented to being involved in the study. The data from the study is confidential and reported in this article in group-form only.

Emotional distress

Participants were asked to rate how they had been feeling *emotionally* during the previous semester for a number of emotional adjectives (*happy, worried, calm, sad, confident, and afraid*) on a four-point scale (*not at all, a little bit, quite a bit, or a lot*). The responses for the positively worded adjectives (*happy, calm, and confident*) were reverse scored and a total score was obtained by averaging across items so that a higher overall score indicates greater emotional distress.

This brief measure of emotional distress was developed for prior research investigating the wellbeing of schoolchildren, parents, and teachers.³ In that study additional data was presented from an ECU first year student sample ($N = 126$; 3% 18-25 years, 16% 26-30 years, 51% over 30 years old; 84% female; *mean* emotional distress score = 2.21, $SD = 0.59$) that answered the emotional distress scale by reflecting on the month prior to the start of the university semester. This measure was found to have good internal consistency among items (Cronbach's alpha = .84). The scale also showed good convergent validity with the well-established Depression, Anxiety, and Stress Scales (DASS-21: Lovibond & Lovibond, 1995) as a strong positive association was found between the emotional distress scale and the overall DASS-21 (*Pearson* $r = .78$, $p < .01$). The emotional distress scale is coded 1: not at all, 2: a little bit, 3: quite a bit, and 4: a lot. Therefore the mean emotional distress score of 2.21 indicates that for this

³ This status of this research is currently 'revise and resubmit' with an education journal. This reference will be ready for inclusion for any final version of this article.

student sample reflecting on life during the month prior to the start of semester they reported on average just above “a little bit” of emotional distress.

Physical distress

To complement the measure of emotional distress, we included a measure of physical distress in our study. Participants were asked to rate how they had been feeling *physically* during the preceding semester by rating six adjectives (*healthy, lethargic, strong, unfit, energetic* and *tense*) on a four-point scale (*not at all, a little bit, quite a bit* or *a lot*). The responses for the positively worded adjectives (*healthy, strong* and *energetic*) were reverse scored. The present study is the first time this measure has been used, and therefore we report in detail the performance of this measure in the results section. As will be discussed, the calculation of the overall physical distress score excludes the ‘tense’ item.

Exercise

Students were asked to state how often they had engaged in *light, medium, and heavy* exercise during semester, on a scale of: *never, once or twice, a few times, about once a week, multiple times per week* or *daily*. Given that there is no uniformly accepted method of measuring exercise (Bray & Kwan, 2006) and the difficulties inherent in defining various levels of exercise, we did not provide a definition or an example for each level of exercise. Rather, we allowed the student participants to use their own judgment in assessing the intensity of the exercise they engaged in during the previous weeks of the survey semester.

Belongingness to University

As in our previous research (Skead & Rogers, 2014, 2015), we measured the participants’ feelings of belongingness by asking “During this semester, I have felt a

strong sense of belongingness to:” the *University* (e.g., UWA), the *school* (e.g., UWA law school) and *my year group*. Students rated their agreement for each item on a scale: *strongly disagree*, *slightly disagree*, *slightly agree* and *strongly agree*. As per our previous research, an overall belongingness measure was created by averaging across items.

University appraisal

Again, consistently with our previous research (Skead & Rogers, 2014, 2015), we measured the participants’ general appraisal of University by asking “During this semester, I have experienced studying law/psychology and UWA/ECU as:” for the adjectives *enjoyable*, *relaxing*, and *worthwhile* on a scale: *not at all*, *slightly*, *somewhat*, *moderately*, *very* and *extremely*. To complement the university appraisal questions described above, we also asked students to rate the extent that they perceived their university experience as constituting *a supportive environment* and *an ultra-competitive environment* on the same *not at all* to *extremely* response scale reported above.

3. RESULTS

3.1 Emotional and physical distress

Due to our emotional distress measure having little prior validation, and our physical distress measure being entirely new, we first provide data to support the appropriateness of the two measures. For both measures the inter-correlations among items are presented in Table 1. As expected, the emotional distress items were consistently moderately associated with one another, with a Cronbach’s alpha of .83, which we deemed acceptable based on guidelines that above .70 is ‘adequate’ and above .80 is

‘good’ (Acock, 2014, p. 368). The physical distress items were also consistently moderately associated with one another with the exception of the item ‘tense’, see Table 1. With this item included, Cronbach’s alpha is .78, and with it excluded, it is .82. On the basis of the statistical evidence, we felt justified in excluding the ‘tense’ item from the calculation of the overall physical distress score.

Table 1: Spearman inter-correlations between emotional and physical distress measures. Spearman correlations are reported due to items being measured on a 4-point response scale.

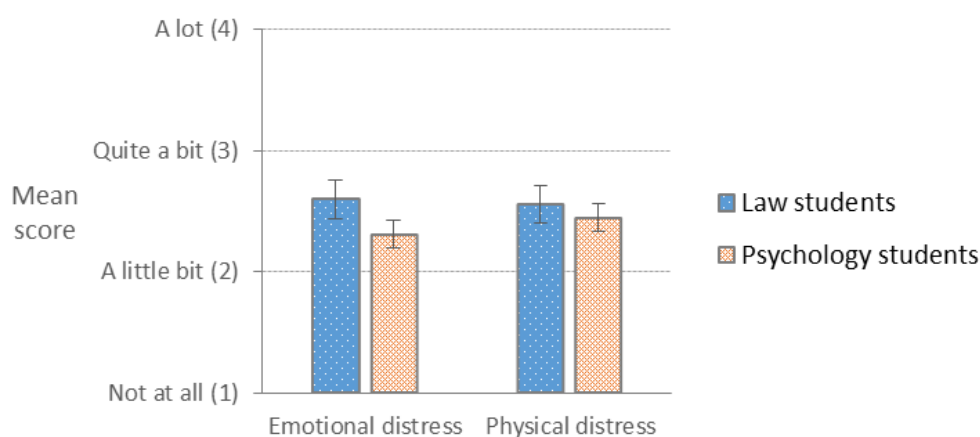
Emotional distress measure						
	1.	2.	3.	4.	5.	6.
Happy (1)	1					
Worried (2)	-.42*	1				
Calm (3)	.53*	-.51*	1			
Sad (4)	-.48*	.45*	-.32*	1		
Confident (5)	.58*	-.42*	.39*	-.41*	1	
Afraid (6)	-.39*	.66*	-.41*	.34*	-.37*	1
Physical distress measure						
	1.	2.	3.	4.	5.	6.
Healthy (1)	1					
Lethargic (2)	-.43*	1				
Strong (3)	.66*	-.47*	1			
Unfit (4)	-.62*	.28*	-.43*	1		
Energetic (5)	.59*	-.38*	.49*	-.37*	1	
Tense (6)	-.16	.35*	-.20*	.13	-.04	1

*p < .05

The mean emotional and physical distress scores are reported separately for law and psychology students in Figure 1. The mean emotional and physical distress score for both law and psychology students fell between “a little bit” and “quite a bit”. The mean emotional distress score for law students was significantly higher compared to the psychology students, $t(133) = 2.91, p < .01, d = .50$. There was no significant difference observed for physical distress, $t(133) = 1.14, p = .26$. The emotional and physical

distress measures were found to have a moderate positive association for both law and psychology students. The correlation was found to be the same when examined separately for both types of students (*Pearson* $r = .58, p < .001$). Therefore, we found evidence for a relationship between how well a person is feeling *physically* with how they are feeling *emotionally*.

Figure 1: Mean emotional and physical distress reported by law and psychology students, with 95% confidence limits.



The findings reflected in Figure 1 are consistent with prior research indicating that law students experience stress, anxiety and depression at rates higher than their contemporaries who do not study law including those studying other professional degrees such psychology (Larcombe, Tumbaga, Malkin, Nicholson, & Tokatlidis, 2013; Lester et al., 2011; Sheldon & Krieger, 2004; Sheldon & Krieger, 2007; Skead & Rogers, 2015; Townes O'Brien et al., 2011). As we have noted previously (Skead & Rogers, 2014, 2015), the suggested causes for this phenomenon are many and varied and include the heavy workload of a law course, the highly competitive nature of law as a discipline, the innately pessimistic and adversarial nature of law, and the Socratic methods commonly adopted in teaching law (Huggins, 2012; Larcombe & Fethers, 2013; Niemiec, Ryan, & Deci, 2010). Other mooted causes include extrinsic

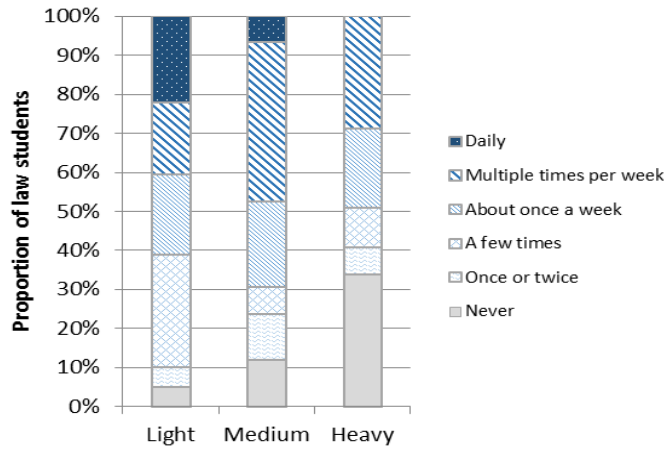
motivations for studying law, a focus on the extrinsic rewards of doing so and the associated pre-occupation with academic results and ranking (Field, Duffy, & Huggins, 2013; Krieger, 2008; Larcombe, Malkin, & Nicholson, 2012).

3.2 Frequency of exercise

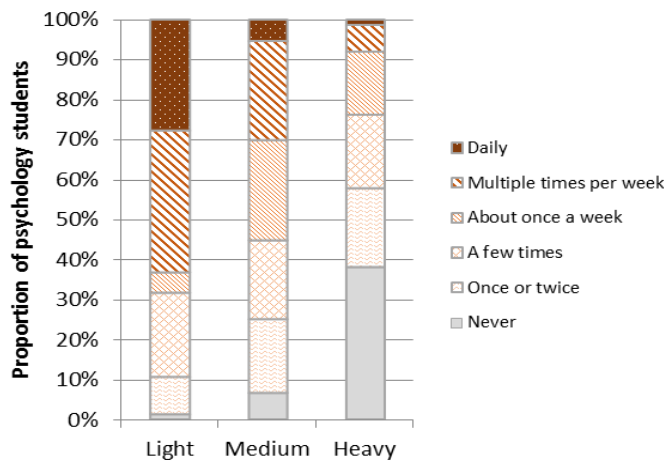
We asked students to indicate how often they engaged in light, medium or heavy exercise during the preceding semester, see Figure 2. Due to some instances of skewness in the data, non-parametric statistical tests were used to test for differences. Using a Friedman's ANOVA with Bonferroni adjusted ($.05/3 = .02$) follow up Wilcoxon signed-rank tests, not surprisingly the general pattern was that light exercise had the highest frequency of occurrence, followed by medium exercise, and then heavy exercise for both the law ($\chi^2(2) = 34.43, p < .001$; all $z_s \geq 4.05, p_s < .02, r_s \geq .53$) and psychology ($\chi^2(2) = 106.75, p < .001$; all $z_s \geq 5.68, p_s < .02, r_s \geq .65$) students. The exception was a non-significant difference between frequency of light and medium exercise for law students ($z = .97, p = .33$). Mann-Whitney Bonferroni adjusted ($.05/3 = .02$) comparisons indicated no statistically significant difference between law and psychology students for each intensity of exercise (all $z_s \leq 2.30, p_s > .02$).

Figure 2: Reported frequencies of light, medium, and heavy exercise during semester for (a) law and (b) psychology students.

(a)



(b)



3.3 Associations between frequency of exercise and emotional and physical distress

The primary aim of the present study was to investigate the relationship between exercise and physical and emotional distress. We report these relationships separately for law and psychology students in Table 2.

Table 2: Spearman Inter-correlations between emotional and physical distress measures with frequency of different levels of exercise, reported separately for law and psychology students.

Law students (N = 59)						
	1.	2.	3.	4.	5.	6.
Emotional distress (1)	1					
Physical distress (2)	.50*	1				
Light exercise (3)	-.25	-.35*	1			
Medium exercise (4)	-.30*	-.64*	.35*	1		
Heavy exercise(5)	-.20	-.67*	.46*	.52*	1	
Psychology students (N = 76)						
	1.	2.	3.	4.	5.	6.
Emotional distress (1)	1					
Physical distress (2)	.54*	1				
Light exercise (3)	-.07	-.16	1			
Medium exercise (4)	.03	-.23*	.68*	1		
Heavy exercise(5)	.10	-.39*	.49*	.53*	1	

* $p < .05$

When examining the pattern of correlations a number of points of interest are revealed. First, frequency of exercise has a much stronger negative association with physical distress compared to emotional distress. These results suggest frequency of exercise is *indirectly* negatively associated with emotional distress via a negative association with physical distress.

Second, reported frequency of medium and heavy exercise has a stronger negative association with physical distress compared to light exercise. Third, the overall pattern of correlations between distress measures and exercise is much stronger for law students compared with psychology students. This provides evidence to suggest that law students may be more responsive to the physical and emotional benefits of engaging in more frequent exercise.

Finally, the different intensities of exercise are moderately positively associated for both law and psychology students. This indicates that a participant reporting a higher

frequency of one type of exercise is more likely to also report a higher frequency for the other two types. This is consistent with the intuitive notion that some people are generally physically active, whereas others are generally physically inactive.

3.4 Belongingness to university, appraisal of university, and associations with emotional distress.

Our prior research evidenced that feeling a sense of belongingness to university is associated with more a positive appraisal of university activities as well as self-reported mental well-being (Skead & Rogers, 2015). In the present study we asked students to indicate whether they felt a strong sense of belongingness to the university, their school, and their year group. The most common response for both law and psychology students across items was “slightly agree”. As shown in Table 3, moderate to strong positive associations were found among all three items. We therefore averaged across the three items to create an overall belongingness-to-university score. No statistically significant difference was found for this overall belongingness-to-university score between law ($M = 2.44, SD = .91$) and psychology students ($M = 2.61, SD = .70$), $t(133) = 1.29, p = .20$. The mean for this overall score for the law and psychology student participants sits roughly in-between “slightly disagree” (2) and “slightly agree” (3). While there was a significant positive association between belongingness and emotional distress for law students ($Pearson r = .43, p < .01$), there was no significant relationship between these two variables for the psychology students ($Pearson r = -.08, p = .51$).

Table 3: Spearman Inter-correlations between belongingness items. Spearman correlations are reported due to items being measured on a 4-point response scale.

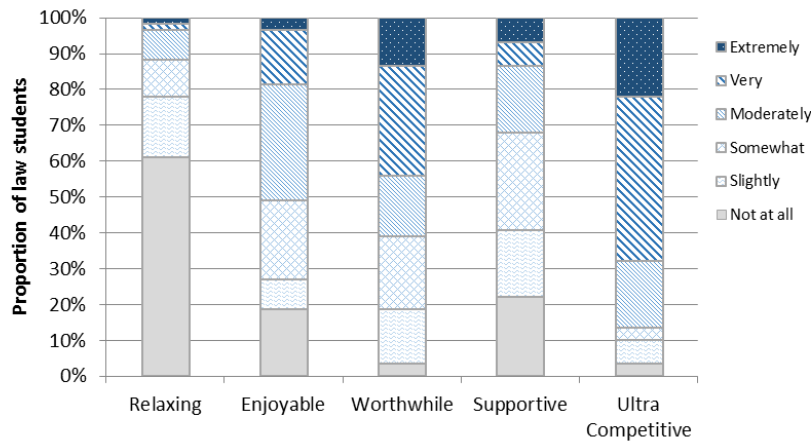
	1.	2.	3.
My university (1)	1		
My school (2)	.59*	1	
My year group (3)	.43*	.71*	1

* $p < .05$

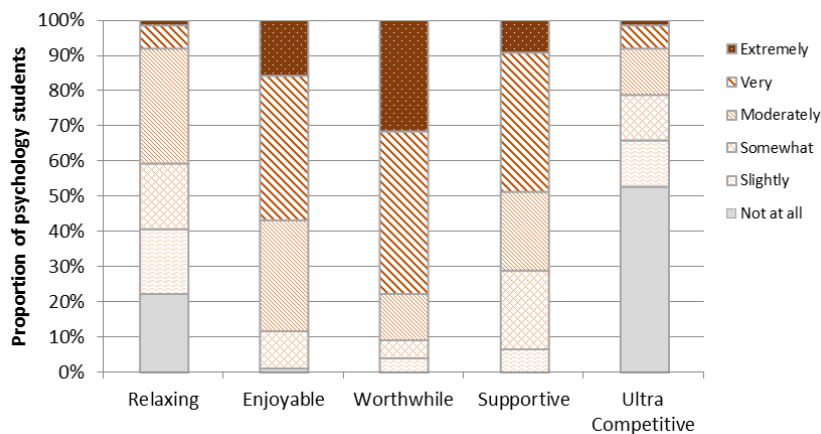
We have previously reported a negative association between student appraisal of a range of university activities and self-reported levels of anxiety (Skead & Rogers, 2015). We therefore expected that in the present study questions relating to the appraisal of a participant’s university experience would be negatively associated with emotional distress. We asked participants to rate how relaxing, enjoyable, and worthwhile they perceived their university experience. Additionally, we asked participants to rate how supportive they considered their university environment, and the competitiveness of that the environment. The responses to these questions are presented in Figure 3. Bonferroni adjusted ($.05/5 = .01$) Mann-Whitney tests were conducted to compare the results across law and psychology students for each question.

Figure 3: Responses to university environment appraisal questions, for (a) law and (b) psychology students.

(a)



(b)



As reflected in Figure 3, law students rated their university experience as *less* relaxing, enjoyable, worthwhile, and supportive than the psychology students, and significantly *more* competitive (all $z_s \geq 4.23$, $ps < .01$, $rs \geq .36$). The largest difference was for the appraisal of the university environment as ultra-competitive, with the most frequent response for the law student participants being “very” (46%), compared to “not at all” (53%) for the psychology student participants.

The associations between university experience appraisal, belongingness, and emotional distress are presented in Table 4. Of primary interest are how the appraisal items associate with emotional distress and belongingness. As expected, the data reveals significant negative associations between the participants' appraisal of their university experience and their emotional distress on the one hand, and positive associations between the participants' appraisal of their university experience and their sense of their belongingness-to-university. The pattern of correlations was once again stronger for law students compared with psychology students.

Table 4: Spearman inter-correlations between emotional distress, belongingness, and appraisal of university items, reported separately for law and psychology students.

Law students (N = 59)							
	1.	2.	3.	4.	5.	6.	7.
Emotional distress (1)	1						
Belongingness (2)	-.37*	1					
Relaxing (3)	-.34*	.30*	1				
Enjoyable (4)	-.39*	.58*	.50*	1			
Worthwhile (5)	-.18	.37*	.32*	.64*	1		
Supportive (6)	-.28*	.50*	.59*	.60*	.58*	1	
Competitive (7)	.35*	-.25	-.27*	-.24	-.17	-.20	1
Psychology students (N = 76)							
	1.	2.	3.	4.	5.	6.	7.
Emotional distress (1)	1						
Belongingness (2)	-.11	1					
Relaxing (3)	-.25*	.22	1				
Enjoyable (4)	-.25*	.25*	.38*	1			
Worthwhile (5)	-.14	.14	.21	.65*	1		
Supportive (6)	-.21	.23*	.02	.31*	.32*	1	
Competitive (7)	.06	.35*	.22	-.07	-.08	.17	1

*p < .05

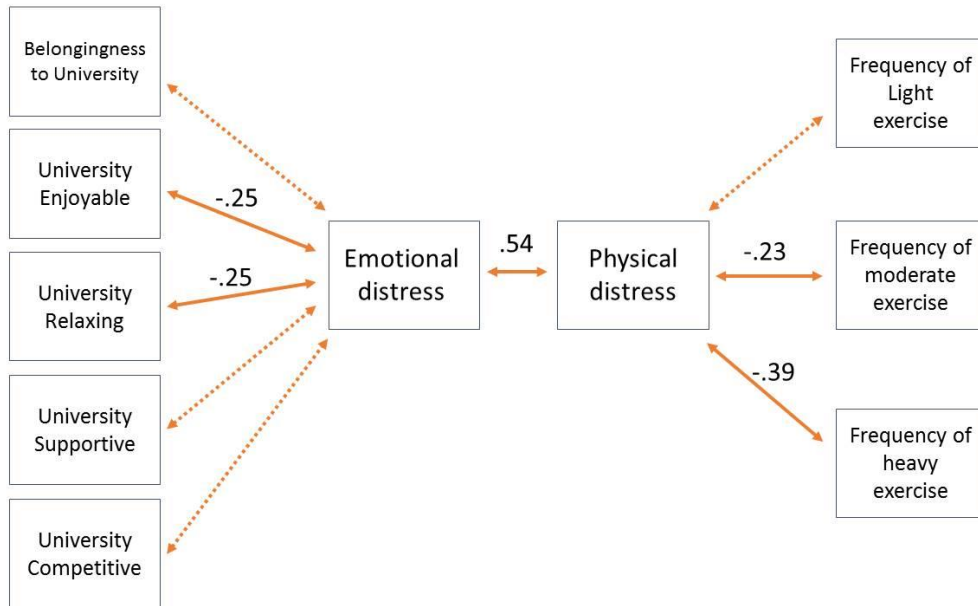
3.5 A summary of significant associations between measures

Figures 4 and 5 summarise the relevant significant correlations from our present study for law and psychology students respectively.

Figure 4: A summary of associations between measures for law students. All numbers represent statistically significant Spearman correlations.



Figure 5: A summary of associations between measures for psychology students. All numbers represent statistically significant Spearman correlations. The dashed lines indicate non-significant correlations. These have been included to allow for easier comparison between this Figure and the results presented for law students in Figure 4.



The emotional and physical distress measures were found to have similar sized moderate positive associations for both law and psychology students. However, in comparison to the psychology students, stronger associations were found for law students between their frequency and intensity of exercise and their physical distress, and between the appraisal of their university experience and their emotional distress. An explanation for this difference may be that compared to the psychology students, law students report their university environment to be more stressful. As noted above, overall the law students reported their university experience to be less relaxing and supportive, and perceive a far more competitive environment. It is in the context of this stressful and competitive environment that buffers against psychological distress, such as feeling a sense of belongingness and keeping physically fit by exercising, are likely to be more powerful and effective for law students.

4. DISCUSSION

Armstrong and Oomen-Early have reported that ‘people who are physically active are 3 times less likely to suffer from depression than are inactive individuals and that depressive symptoms decrease with increasing levels of physical activity’. They noted, further, that ‘people who are more socially connected report less psychological distress, including depression and low self-esteem, than people who are less connected’ (Armstrong & Oomen-Early, 2009, p. 521). The results of the present study support these assertions. We found that students reporting a higher frequency of exercise felt better physically. This positive association strengthened as the frequency and intensity of the exercise increased. In turn, feeling healthier physically was moderately positively associated with feeling healthier emotionally.

Consistent with prior research reporting a higher prevalence of self-reported psychological distress in law students compared to other university students, including psychology students (Larcombe et al., 2013; Lester et al., 2011; Sheldon & Krieger, 2004; Skead & Rogers, 2014, 2015; Townes O’Brien et al., 2011), overall the law students we surveyed reported more *emotional* distress compared to psychology students. There was, however, no significant difference in reported *physical* distress.

Previous research has suggested that a possible cause for the heightened psychological distress in law students is the highly competitive nature of the environment in which law is learned and the lack of belongingness and social connectedness that law students experience in this more pressured environment (Hess, 2002; Huggins, 2012; Kelk et al., 2009; Larcombe & Fethers, 2013; Niemiec, Ryan, & Deci, 2010; Peterson & Peterson, 2009; Skead & Rogers, 2015; Tani & Vines, 2009; Watson & Field, 2011). Consistent with these hypotheses, the law student participants in the present study reported their university environment to be significantly more competitive and significantly less

supportive, worthwhile, relaxing and enjoyable than did the psychology student participants.

We suggest that it is likely this more stressful university environment in which they are learning that underlies the consistently stronger associations between exercise and physical distress, and between the appraisal of the university experience and emotional distress, for law students in comparison to psychology students revealed in our present study. Beyond university, it has been suggested that ‘unhappy, stressed put, depressed law students often become unhappy, stressed-out lawyers’ (Jolley-Ryan, 2009, p. 100). It is not only law schools, but the legal profession itself that is now recognised as inducing high levels of stress compared with most other professions (Bergin & Jimmieson, 2013). In 2009, the Brain and Mind Research Institute at the University of Sydney reported that almost a third of solicitors and one fifth of barristers surveyed in their study into ‘[a]ttitudes towards depression in Australian law students and legal practitioners’ reported suffering from clinical depression (Kelk et al., 2009). The phenomenon of high levels of psychological distress in the legal profession is not limited to Australia, with research indicating similar trends in the United States (Levit & Linder, 2008) and the United Kingdom (Collier, 2014). The comparatively heightened importance of protective mental health factors such as belongingness and exercise identified for law students may, therefore, also extend to legal practitioners. This is an avenue for future research.

Our finding of a positive association between law student belongingness-to-university and emotional distress is consistent with Armstrong and Oomen-Early’s report that ‘people with low levels of social connectedness report more psychological distress’. Armstrong and Oomen-Early therefore suggested that ‘[h]ealth promotion programs should focus on educational activities that increase levels of social connectedness’

(Armstrong & Oomen-Early, 2009, pp. 521, 524; see too Dhurup, 2012, p. 615). This is what the UWA Law School sought to achieve through the *Bootcamp* program.

The *Bootcamps* provided an opportunity for staff and students to gather on a weekly basis for a free, one-hour outdoor exercise session. The sessions included solo, paired and group activities and participants could pace themselves and determine the level of intensity at which they participated. The anecdotal evidence was that the sessions were attended by roughly an equal number of staff and students and were collegial and although physically challenging, worthwhile and enjoyable.⁴ By providing students with a free and convenient, on-campus, opportunity to engage in physical exercise and, in doing so, engendering a stronger sense of connectedness among students and between staff and students, the *Bootcamps* provide a simple and cheap way to support the physical and psychological well-being of law students. It also sends a strong message to law students at UWA that the Law School takes their well-being seriously, and that whether through the *Bootcamp* or otherwise they are encouraged to become more physically active.

It has been noted by others that ‘[t]he issue of the dose-response relationship between physical activity and mental health is an unresolved one’ (Tyson et al., 2010, p. 496) and that ‘mental health benefits were observed at a minimum physical activity level of at least 20 min/week of any type of activity’ (Hamer et al., 2009, p. 1113). However, the results of our study suggest that the more frequent and intense the exercise, the greater the impact on physical and psychological well-being. So, while one 1-hour *Bootcamp* a week is a positive initiative and may well be sufficient to have an impact

⁴ Natalie Skead attended 7 *Bootcamp* sessions during the course of the 13-week semester.

of student well-being, more frequent *Bootcamps* would provide additional benefits for students.

5. LIMITATIONS OF THE PRESENT STUDY

While the present study confirms the findings of previous studies into the association between exercise and mental health and provides new insights into the comparative impact of exercise on the physical and psychological well-being of law and psychology students respectively, much like existing research in this area, the usefulness of the data is limited by a number of factors.

In the first instance, the results do not infer a cause and effect relationship. We found that university students who exercise more frequently and at a greater intensity report lower physical distress and, in turn, emotional distress. However, due to the correlational nature of our data we are unable to conclude with certainty whether an increase in exercise produces an improved sense of physical well-being or if improved physical well-being acts to encourage more frequent exercise. As Tyson et al note, '[i]t may be the case that the more depressed and anxious an individual becomes, the less likely they are to engage in physical activity' (Tyson et al., 2010, p. 496; see too De Moor et al., 2006 p. 278; Hamer et al., 2009 p. 1114; ten Have et al., 2011, p. 346).

Secondly, the present research relied on participants self-reporting their levels of physical and emotional distress as well as the frequency and intensity of exercise in which they engaged during the university semester. The subjective empirical data collected via the online survey is not supported by objective assessment methods (Bray & Kwan, 2006, p. 81; Byrne & Byrne, 1993, p. 570; Hawker, 2012, p. 329; Sylvester et al., 2012, p. 146).

A third limitation of the present study is the absence of any reference to the specific type of exercise in which participants engaged and the reliance on participants to self-assess the intensity of their exercise (ten Have et al., 2011, p. 347). As noted above, this is a result of there being no uniformly accepted method of measuring exercise (Bray & Kwan, 2006) and the difficulties inherent in defining various levels of exercise. Despite this, allowing participants to interpret levels of exercise without specific guidance produced logical results that conformed to expectations.

6. CONCLUSION

In 1899 William James stated that he hoped ‘more and more the ideal of the well-trained and vigorous body will be maintained neck by neck with that of the well-trained and vigorous mind as the two co-equal halves of the higher education for men and women alike’ (James, 1899, p. 501). Almost one hundred and twenty years later we echo this sentiment and repeat the advice we gave following our previous study that ‘[a] basic starting point for law students is that, whatever other wellbeing strategies they might adopt, they should all endeavour to exercise more’ (Skead & Rogers, 2014, p. 22).

The results of the present study support the conclusion that there is an association between exercise and mental well-being generally. Our results suggest that more frequent exercise is associated with a more favourable appraisal of one’s physical well-being, which in-turn is positively associated with one’s emotional well-being. These findings contribute to the increasing body of literature confirming the positive correlation between exercise and mental health. For law students, many of whom experience psychological distress while at university, the association between exercise and appraisal of one’s physical well-being was shown to be stronger than that for the comparison group of psychology students.

Promoting exercise in law students is likely to result in physically and mentally healthier students, which may in turn ‘lead to improved student retention ... and the emergence of healthier professionals for the workplace’ (Hawker, 2012, p. 330). Law schools have an important role to play in this regard:

College campuses need to recognize the importance of a healthy mind and body and specifically address how depression impacts academic performance, school and life satisfaction, and social relationships. Reducing the prevalence of depression among college students must involve a multidimensional, comprehensive, and collaborative approach ... to combat the multifaceted correlates and impact of depression (Armstrong & Oomen-Early, 2009).

In a similar vein, the Honourable Justice Shane R Justice Marshall of the Federal Court of Australia concluded his keynote address at the Australian National Wellness for Law Forum in February 2015 by emphasising the challenge of the increasing incidence of depression in law students and young practitioners. His Honour stressed that depression in law students and legal practitioners ‘can no longer be treated as a side issue. Active planning to assist students to combat it is a necessity – not an option’ (Marshall, 2015).

Demanding university courses can place students at risk of developing mental illness. Clearly interventions are required to minimise psychological distress and, in turn, maximise wellbeing and performance while at university. However after university, graduates face new challenges as frequent exposure to clients who are experiencing psychological distress has been shown to put practitioners at risk of experiencing psychological burnout in both law (Levin et al., 2011; Lustig et al., 2008; Murdoch, 2000; Resnick, Myatt & Marotta, 2011; Vrkleviski & Frankiln, 2008) and the mental health professions (Craig & Sprang, 2010; Newell & MacNeil, 2010; Ray, Wong, White & Heaslip, 2013; Thompson, Amatea & Thompson, 2014). Instilling healthy

stress-buffering lifestyle habits in students will serve them well both during their time at university and in their chosen career.

Embedding an exercise program such as the *Bootcamps* introduced by the UWA Law School is a simple, cheap and effective way law schools can support the mental health of their students. In the words of the much-lauded Australian comedian, actor and musician, Tim Minchin, in detailing the nine life lessons in his valedictory address when conferred an Honorary Doctorate in 2013, ‘there is an inverse correlation between depression and exercise. Do it, run my beautiful intellectuals, run’ (Minchin, 2013).

Acknowledgements

The authors would like to acknowledge the research assistance of Yannis Vrodos in preparing to write this article and the work of Natasha Terbeeke, the Faculty Administrative Office at the UWA Law School for conceptualising, planning and running the *Bootcamp* program.

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