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Evaluation of the Revised Effects of University Study on Lifestyle Questionnaire (R-EUSLQ) upon students' anxiety and depression

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Abstract

Background: The incidence of clinical anxiety and depression among university students is significantly elevated above that for the rest of the population, and has been shown to be an outcome of the specific stressor demands encountered by that group.

Aims: To revise a scale that will reliably identify those stressors and the effects they have on student anxiety and depression.

Sample: From advertising of the project, 398 Australian university student volunteers were recruited.

Method: Participants completed the Revised Effects of University Study on Lifestyle Questionnaire (the R-EUSLQ), which measured the incidence of stressors and lifestyle changes brought about by university study, plus the Zung Self-Rating Anxiety Scale and Self-Rating Depression Scale.

Results: Psychometric data were satisfactory and significant correlations existed between total scores from the three scales. Factor analysis of the R-EUSLQ revealed five components, only three of which significantly predicted anxiety or depression.

Conclusions: Students' principal source of stress that was associated with anxiety and depression was their feelings of isolation and consequent psychological distress. The R-EUSLQ has the potential to be used in research into student stress and also within clinical settings.

Introduction

The adverse effects of clinical and subsyndromal depression on health, relationships and cognitive performance are well-documented (Judd et al. 1996; Druss & Rosenheck 1999; Nutt 2004; Lyness et al. 2006). Depression is the major contributor to the total disease burden (Ustun et al. 2004) and predicted to become the second leading cause of mental illness by 2020 (Murray & Lopez 1997; WHO 2001). In addition, depression poses as great a risk for mortality as does smoking, even when related health factors such as blood pressure, alcohol intake, cholesterol and social status are taken into account (Mykletun et al. 2009). With between 13 per cent (Europe) and 17 per cent (USA) of people having a major depressive episode at some time in their lives (Kessler et al. 1994; Alonso et al. 2004; Kessler et al. 2005), the incidence of depression makes it a major area of investigation for assessment and treatment research.

Stress is one of the major predictors of depression, acting through demanding challenges across a range of areas (Mirescu & Gould 2006). Although genetic factors influence the likelihood of an individual developing depression (López León et al. 2005, 2008; Hettema et al. 2006), the reliable identification of environmental 'triggers' of depression is a high priority in research on psychological assessment. Data that explain the possible links between aversive environmental events and consequent development of depressive symptoms are one way to investigate the kinds of environmental events that are most likely to instigate depression in those people who are most at risk.

There is ample evidence that the transition from secondary school to further studies (either at college in the USA or at university in Australia, both of which may entail leaving home and living independently for the first time) presents a major challenge to students and is a period of major stress that may lead to depression. For example, studies of depression among college students in the USA (Alloy et al. 2006) have reported rates of up to 16 per cent for major depression and 45 per cent for minor depression for students with no prior history of depression, with up to 28 per cent of first-year university students being overwhelmed and 8 per cent depressed (Kitzrow 2003). Other data underline the importance of studying this group by showing that

15 per cent of the students studied were depressed and 20 per cent reported suicidal ideation, but only 27 per cent of the depressed students received treatment (Tjia et al. 2005). There are higher levels of depression among university students than in the general community (Tanaka & Huba 1987; McLennan 1992). Students need to deal with the transition from home to independent living, plus the multiple challenges of new academic, financial, social and sexual demands, as well as sleep deprivation (Scott & O'Hara 1993), perhaps explaining why they are more depressed than the general community. Depression among university students can also adversely affect their academic performance (Dyrbye et al. 2006) and contribute to learning difficulties, thereby compounding the stress experienced. For these reasons, the identification of the particular stressors that university students meet could provide a model for application to wider populations, as well as meeting the intrinsic need to identify the major triggers of depression among this group.

Several attempts have been made to develop a list of such trigger events within student populations. For example, Keller and Nesse (Keller & Nesse 2005, 2006; Keller et al. 2007) identified categories of stressors and particular depressive symptoms among university student samples, reporting that different stressors were associated with different depressive symptoms (e.g. social losses with crying and arousal, and failure to reach a goal with fatigue and pessimism). However, the focus of those investigations upon *categories* of stressors may overlook the *specific events* that certain groups of people experience. As has been shown previously, not all (assumed) stressors have negative effects upon those who are experiencing them and some even have reportedly positive effects (Sharpley et al. 2004). Therefore, although some of the *categories* of stressors that university students meet have been identified and their effects noted, relatively little has been reported regarding the effects on depressive behaviour of specific stressors that these individuals experience.

Following a search of Science Direct, PubMed and Google Scholar in April 2009, using the descriptors 'stressors', 'depression', 'college students' and 'university students', which failed to produce any reports describing the range of specific stressors that this population experiences and their effects upon student depression, we developed a scale to identify potential stressors that university students might encounter (the Effects of University Study upon Lifestyle Questionnaire: Bitsika et al. 2010). Based upon individual interviews with 20 university students, that scale consisted of 60 events and experiences that those students reported as challenges caused by university study to which they had to adjust and which caused them to feel anxious, uncertain or depressed. After being administered to 402 university students, data indicated that the scale had acceptable internal consistency (.91, Cronbach's alpha) and total scores were significantly ($p < .001$) correlated with anxiety (.338) and depression (.336). Linear regression also indicated that it was the simple frequency of occurrence of the 60 events listed in the R-EUSLQ that predicted anxiety and depression. In a further examination of the links between the R-EUSLQ and anxiety and depression, students who met the criteria for clinically significant anxiety or depression had significantly ($p < .001$) higher R-EUSLQ scores than students who did not meet these clinical criteria (Bitsika et al. 2010). Finally, psychometric data from that study suggested that the R-EUSLQ could be

reduced from 60 to 42 items and revised to present a simpler format. The present study reports on the psychometric evaluation of the shortened version of the R-EUSLQ in its simpler format, plus its relationship with anxiety and depression among another sample of university students. Both anxiety and depression were assessed in this study, as previously, because of the overlap in symptomatology (APA 2000) and comments that these two disorders may be interrelated (Zinbarg et al. 1994; Nutt 2004).

Method

Participants

Three hundred and ninety-eight university students (191 females, 207 males) from a private university in Queensland, Australia volunteered to participate in the study. Their mean age was 22.6 years (SD = 6.3 years, range from 16 to 54 years). Participants represented all faculties of the university (humanities/social sciences/education, law, health and medicine, business and IT).

Measures

Anxiety

'Anxiety' is defined in the standard psychiatric literature (APA 2000) as a range of disorders but the most prominent form is Generalised Anxiety Disorder, which is accompanied by such symptoms as being worried about events most of the time, being unable to control the worry and showing signs of restlessness, being easily tired, having difficulty concentrating, being irritable, suffering from muscle tension and sleeping poorly. The Self-Rating Anxiety Scale (SAS) (Zung 1971, 1980) is a brief, self-report questionnaire that measures the presence and magnitude of the anxiety-based symptoms that are listed in the DSM-IV-TR (APA 2000) criteria for anxiety, supporting a high content and face validity. Each item is scored on a 4-point scale in relation to whether the person has experienced each specific symptom 'none or a little of the time' (rating = 1), 'some of the time' (2), 'a good part of the time' (3), or 'most or all of the time' (4) during the last two weeks. There are positively and negatively worded items to reduce response bias and identify inconsistencies in responses. Raw scores sum to a total that ranges from 20 to 80, with higher total scores reflecting a more anxious individual than lower total scores. The SAS correlates .75 with the Hamilton Anxiety Scale (Zung 1971) and has been shown to significantly discriminate between adults without an anxiety disorder and patients with anxiety disorders (Zung 1971). Reliability data are .71 (split half: Zung 1971) and .77, .79 and .85 (coefficient alpha), the latter three datum being from three Australian samples of 552, 197 and 195 participants respectively (Sharpley & Rogers 1985; Sharpley et al. 2007; Sharpley & Christie 2007a, 2007b). Zung set a cut-off raw score of 36, above which he described participants as having anxiety that 'was clinically significant' (Zung 1980, p. 18), or that prevented them from carrying out their usual work or recreation activities.

Depression

The definition of depression also includes a number of disorders, but the most prominent is Major Depressive Disorder (APA 2000). Symptoms include feeling sad

or empty, being tearful, loss of interest in most activities, weight loss or gain, fatigue, sleeping problems, agitation, feeling worthless, concentration difficulties, and thoughts of death. The Self-Rated Depression Scale (SDS) (Zung 1965, 1973) is also a brief, 20-item self-report questionnaire which measures the presence and magnitude of these depressive symptoms. The same 4-point scale as in the SAS is used and there are positively and negatively worded items to reduce response bias and identify inconsistencies in responses. Raw scores range from 20 to 80, with higher scores reflecting a more depressed individual. Zung (1973) set a cut-off score of 40, above which participants were experiencing clinically significant depression (i.e. that which might strongly interfere with their ability to function within their normal daily routines). The SDS has high concurrent validity (Zung 1965), and Schaefer et al. (1985) showed that the SDS was superior to the Beck Depression Inventory and the MMPI-D scale in assessing depression in male psychiatric patients. The reliability of the SDS has been reported as between .73 (split half) and .90 (coefficient alpha) (Zung 1965, 1973) and .84 with two recent Australian samples (Sharpley & Christie 2007a, 2007b).

Stressors of university study

The Revised Effects of University Study on Lifestyle Questionnaire (R-EUSLQ) consists of 42 items that represent the most common challenges and stressors that students previously reported experiencing. As might be expected, these were also the items that caused them to feel most stressed and that were found to be significantly associated with anxiety and depression (Bitsika et al. 2010). The development and subsequent formatting for the previous version of the EUSLQ have been described above. In the revised version of the R-EUSLQ, which was evaluated in this study, the same four-option response scale was used as for the SAS and SDS, giving a possible range of 42 to 168, with higher scores indicating that participants had experienced more lifestyle changes and challenges.

Procedure

Following recruitment during lectures and via informal advertisements placed in the university, participants completed the survey questionnaires individually and anonymously either in class or privately in an office on university premises dedicated to this process. Once completed, the questionnaires were stored in a secure location before coding for subsequent data analysis. Ethical approval was obtained from the Bond University Human Research Ethics Committee.

Results

Psychometric evaluation

Table 1 shows the relevant psychometric data for each of the three scales. On the basis of Zung's cut-off score of 36 to indicate the presence of 'clinically significant' anxiety, 146 (36.8%) of participants fell into this category. Using Zung's cut-off score, 141 (35.4%) of the sample were clinically depressed. The Kolmogorov-Smirnov for all three scales' statistics were satisfactory, skewness and kurtosis were minor, and inspection of the Boxplots, the Normal Q-Q Plots, the Detrended Normal Q-Q Plots, plus the histograms indicated that data from the SAS, SDS and R-

EUSLQ satisfied normality requirements. The only outliers present were genuine scores and so were included in further analyses. None of the corrected item-total correlations for the R-EUSLQ were less than .3, and none of the alpha values 'if item deleted' scores suggested that any item of the R-EUSLQ should be removed from the scale to increase its reliability.

Table 1: Psychometric data for SAS, SDS, R-R-EUSLQ

	SAS	SDS	R-EULSQ
Mean	35.196	37.809	89.072
SD	8.687	8.703	20.158
Range	20-60	20-69	46-168
5% trimmed mean	34.758	37.609	88.400
Cronbach's alpha	.86	.85	.94

Relationships between total scores

SAS and SDS total scores were significantly correlated ($r = .78$, $p < .001$), and also SAS with R-EUSLQ ($r = .49$, $p < .001$) and SDS with R-EUSLQ ($r = .51$, $p < .001$). Linear regression using R-EUSLQ as the dependent variable confirmed these correlations: R square was .534 ($F(2, 396) = 78.773$, $p < .001$) and the beta weights (standardised coefficients) were .339 ($t = 4.950$, $p < .001$) for SDS and .226 ($t = 3.298$, $p < .01$) for SAS.

The relationships between the R-EUSLQ, anxiety and depression were further examined via ANOVA on R-EUSLQ scores for those participants who met Zung's (1980) criteria for clinically significant anxiety and depression versus those who did not. Table 2 shows that the more anxious or depressed students had significantly higher R-EULSQ scores than their non-clinical peers. There were no significant interactions between SAS and SDS categories and R-EUSLQ scores.

Table 2: Relationships between total scores

Subgroup	*n*	Mean R-EUSLQ	*F*	*p*
Clinically anxious	146	96.953		
Not clinically anxious	251	86.863	16.465	<.001
Clinically depressed	140	97.058		
Not clinically depressed	251	86.757	16.465	<.001

Relationships between variables: factor scores

The data reported above are informative but limited by their reliance upon total scale scores. In order to further investigate the nature of the relationships between the R-EUSLQ and anxiety and depression, factor analysis was performed on the R-EUSLQ. With 398 participants, the ratio of cases to R-EUSLQ items was nearly 10:1, in excess of the 5:1 ratio recommended (Tabachnick & Fidell 1996). In addition, there were many inter-item correlations of .3 or greater for both scales, the Kaisser-Meyer-Olkin measure of sampling adequacy was .920 (in excess of the recommended 0.6 value) and Bartlett's test of sphericity was significant ($p < .001$), justifying factor analysis with these data. Examination of the eigenvalues, the scree plot and parallel analysis all consistently suggested a five-factor solution would best fit the data. Because the component correlation matrix showed that inter-factor relationships were nontrivial, Oblimin rotation was applied to the forced five-factor solution, and convergence was obtained within 12 iterations. This solution explained 49.395 per cent of the variance. The Pattern Matrix model for these five factors and their respective items is shown in Table 3. From these, factors were identified as: Factor 1 (13 R-EUSLQ items) 'Anxiety due to study demands'; Factor 2 (7 items) 'Financial problems'; Factor 3 (7 items) 'Psychological distress and loneliness'; Factor 4 (6 items) 'Health concerns'; and Factor 5 (7 items) 'Time pressures'. Two items ('Less contact with family and friends' and 'Feeling tired') failed to load on any factor.

Table 3: Items, factors, factor loadings and mean scores from the R-EUSLQ

Factor	Item	Loading	Item mean	Factor mean
1	Feeling guilty about avoiding study	.714	2.38	
	Difficulty settling into a study routine	.702	2.36	
	Difficulty in prioritising tasks	.564	2.04	
	Worry about meeting study demands	.534	2.50	
	Difficulty getting up in the morning	.532	2.34	
	Decrease in concentration level	.506	2.06	
	Anxiety about grades	.447	2.50	
	Feeling irritable	.403	2.01	
	Less clarity of mind	.384	1.93	
	Inability to make long-term plans	.370	2.13	
	Feeling lethargic	.367	2.10	
	Less tolerance of others	.362	1.78	
	Fewer feelings of calm	.330	2.04	2.16
2	Less money for small daily expenses	.370	2.39	
	Sticking to a strict budget	.724	2.35	
	Loss of earning power	.658	2.20	
	Less shopping for personal items	.576	2.28	
	Decrease of standard of living	.567	1.87	
	Paying for books and study resources	.533	2.20	
	Increased debt and loans	.531	2.18	2.21
3	Feelings of loneliness	.841	1.84	
	Feelings of isolation	.839	1.66	
	Feelings of sadness	.720	1.66	
	Less self-confidence	.563	1.71	
	Feeling angry	.510	1.72	
	Decrease in feelings of wellbeing	.440	1.83	
	Less quality time with family and friends	.382	2.27	1.81
4	Decrease in overall fitness level	.836	2.10	
	Exercising less	.752	2.16	
	Walking less	.699	1.81	
	Weight gain	.677	2.22	
	Eating more junk food	.561	2.24	
	Difficulty falling asleep	.429	1.91	2.07
5	Less free time	.771	2.22	
	Less time for social outings	.696	2.14	
	Juggling things to make time for study	.584	2.39	
	Less time for clubs and parties	.540	2.10	
	Less ‘me’ time	.507	2.12	

Less flexibility in daily schedule	.499	2.22	
Feeling stressed about meeting deadlines	.487	2.49	2.24

Multiple regression was then used to investigate the relative contribution that each of these five R-EUSLQ factors made to anxiety and depression. First, using SAS total score as the dependent variable, R square was .285 ($F(5,396) = 31.220$, $p < .001$). Examination of the Beta weights (standardised coefficients) showed that SAS total score was most strongly predicted by R-EUSLQ Factor 3 ($\beta = .279$, $t = 4.715$, $p < .001$), followed by R-EUSLQ Factor 1 ($\beta = .195$, $t = 2.960$, $p < .005$) and R-EUSLQ Factor 4 ($\beta = .165$, $t = 3.083$, $p < .005$). Neither R-EUSLQ Factors 2 nor 4 significantly predicted SAS score. For the SDS, the R square was .363 ($F = 44.633$, $p < .001$), and Beta weights indicated that R-EUSLQ Factor 3 ($\beta = .364$, $t = 6.511$, $p < .001$), R-EUSLQ Factor 1 ($\beta = .291$, $t = 4.679$, $p < .001$) and R-EUSLQ Factor 4 ($\beta = .114$, $t = 2.252$, $p < .05$) were all significant predictors of SDS total scores. The correlations between the five factors were low to moderate (from .208 to .392), indicative of sufficient separation between them. Assumptions of multicollinearity, normality, linearity, homoscedasticity and independence of residuals were met.

The R-EUSLQ

As well as the factors and item loadings, Table 3 also shows the mean score (range was 1 to 4) for each item as given by this sample and the mean score for each factor. There was a significant difference between the mean scores for the five factors ($F(4,40) = 6.631$, $p < .001$) and Scheffe contrasts showed that this was attributable to Factor 3 having a significantly lower mean score than Factors 1 ($p < .01$), 2 ($p < .01$) and 5 ($p < .01$). That is, psychological stress and loneliness was reported less frequently by this sample than anxiety due to study demands or time pressures. The two items that did not load on any of the five factors had mean scores of 2.35 and 2.44 respectively.

Discussion

The revised form of the R-EUSLQ has demonstrated internal consistency and shown significant associations with the probable negative outcomes of prolonged stress engendered by the demands of studying – that is, anxiety and depression. The range of items in this version of the R-EUSLQ was drawn from two previous studies, starting with clinical interviews and progressing to an initial psychometric evaluation with a typical sample. The present refinement process allows the R-EUSLQ to be considered for research and clinical use.

As well as the psychometric aspects of this study, some interesting findings have emerged regarding the various kinds of stressors that university students encounter and how they comparatively contribute to the anxiety and depression these students report. Both the regression analysis and ANOVA using total scores emphasised the links between the kinds of stressors tapped by the R-EUSLQ and anxiety or depression. Although the relationship between the R-EUSLQ and depression was more powerful than that for anxiety, thus suggesting that the lifestyle changes listed

in the R-EUSLQ were more likely to result in depression than in anxiety, the principal value of this aspect of the study was in the determination of those factors that underlie the R-EUSLQ and the ways in which they are related to depression and anxiety.

The finding of five underlying components to the R-EUSLQ allows for some further understanding of how the demands of university study act upon students to produce anxiety and depression. The item and factor means shown in Table 3 (and the presence of a significant difference among the five factors) allow for some comparisons to be made between the major underlying components of the effects of study upon student lifestyle and mental health. That the psychological aspects of university study (e.g. loneliness, isolation, decreases in wellbeing) were sufficiently present so as to form a separate factor indicates that these outcomes of university study were significantly experienced by at least this sample. Judging on the basis of the factor mean scores, this aspect of university study stress does not appear to be of as great a concern as are those aspects to do with managing their time, putting up with reduced social life, balancing finances and maintaining a healthy lifestyle. However, that conclusion is challenged (and largely refuted) by the finding that psychological distress was the most powerful predictor of both anxiety and depression, followed by anxiety due to study demands (Factor 1) and health concerns (Factor 4). Neither financial issues nor time pressures significantly predicted anxiety or depression, and the first of these is of particular interest since the university from which this sample was drawn was private and therefore charged fees that were about 400 per cent greater than those from state universities in the nearby region, requiring that many students undertake significant bank loans and part-time employment to meet their goals. The failure of time pressures to predict anxiety or depression requires further investigation, since some of the items in Factor 1 have a degree of communality with this aspect of university study stress.

That is, even though this sample reported experiencing psychological distress due to isolation and loneliness less frequently than the other four R-EUSLQ factors, the regression results suggest that it was the most powerful influence over whether they developed clinical levels of anxiety or depression. This has particular relevance for understanding how the demands of university study affect students' levels of anxiety and depression, and also for those who provide mental health services to this population. As such, these data extend those previously reported regarding the issues that students face and how they respond to them.

Several limitations were present. The sample was restricted to a single university in Australia and results may not generalise to other settings. Although they were asked to complete the SAS and SDS according to the scales' directions, the data collected on anxiety and depression represent only a segment of the students' time at university and it may be that results would change if data were collected at different times during their semester. The significant relationship between Factor 3 and the SAS and SDS may have been influenced by the presence of similar constructs in these scales. However, none of the R-EUSLQ Factor 3 items were identical with items on the SAS or SDS, and so this may not represent a major source of confound. These issues could be fruitfully examined in future research.

However, notwithstanding these limitations, the results of this study provide a substantial basis for understanding the ways in which the various stressors that are associated with university study can influence the levels of anxiety and depression among students. Further, the detection of those kinds of stressors, and the effects they may have upon students' mental health, can be facilitated by the R-EUSLQ. Use of the scale in university counselling settings might provide an overview of a particular student's lifestyle and the effect that it is having upon the student's levels of anxiety and depression and (by extension) on their ability to function effectively within the daily routines they follow. As well as in clinical settings, the R-EUSLQ might be profitably used as part of a proactive program focused upon students' general coping and mental health status. For example, used as a voluntary self-screening tool during various times of the semester, the R-EUSLQ might help students become aware of their own levels of stress, identify which of the many demands they meet are having the most powerful effect upon them, and perhaps contribute to a self-management strategy for coping most effectively with the challenges they meet in their new life at university.

References

Alloy, LB, Abramson, LY, Whitehouse, WG et al. 2006, 'Prospective incidence of first onsets and recurrences of depression in individuals at high and low cognitive risk for depression', *Journal of Abnormal Psychology*, vol. 115, no. 1, pp. 145–156.

Alonso, J, Angermeyer, MC, Bernert, S et al. 2004, 'Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project', *Acta Psychiatrica Scandinavica*, vol. 109, no. 420, pp. 21–27.

American Psychiatric Association 2000, *Diagnostic and statistical manual of mental disorders*, 4th ed, American Psychiatric Association, Washington, DC.

Bitsika, V, Sharpley, CF & Hartley, L 2010, 'Identifying the specific environmental antecedents of depression among Australian university students: development of the Effects of University Study on Lifestyle Questionnaire', *International Journal of Educational and Psychological Assessment*, vol. 4, pp. 2–18.

Druss, BG & Rosenheck, RA 1999, 'Patterns of health care costs associated with depression and substance abuse in a national sample', *Psychiatric Services*, vol. 50, no. 2, pp. 214–218.

Dyrbye, L, Thomas, M & Shanafelt, TD 2006, 'Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students', *Academic Medicine*, vol. 81, no. 4, pp. 354–373.

Hettema, JM, An, SS, Neale, MC et al. 2006, 'Association between glutamic and decarboxylase genes and anxiety disorders, major depression, and neuroticism', *Molecular Psychiatry*, vol. 11, no. 8, pp. 752–762.

Judd, LL, Paulus, MP, Wells, KB & Rapaport, MH 1996, 'Socioeconomic burden of subsyndromal depressive symptoms and major depression in a sample of the general population', *American Journal of Psychiatry*, vol. 163, pp. 1411–1417.

Keller, MC, Neale, MC & Kensler, KS 2007, 'Association of different adverse life events with distinct patterns of depressive symptoms', *American Journal of Psychiatry*, vol. 164, no. 10, pp. 1521–1529.

Keller, MC & Nesse, RM 2005, 'Is low mood an adaptation? Evidence for subtypes with symptoms that match precipitants', *Journal of Affective Disorders*, vol. 86, pp. 27–35.

Keller, MC & Nesse, RM 2006, 'The evolutionary significance of depressive symptoms: different adverse situations lead to different depressive symptom patterns', *Journal of Personality and Social Psychology*, vol. 91, no. 2, pp. 316–330.

Kessler, RC, Berglund, P, Borges, G, Nock, M & Wang, PS 2005, 'Trends in suicide ideation, plans, gestures, and attempts in the United States', *Journal of the American Medical Association*, vol. 293, pp. 2488–2495.

Kessler, RC, McGonagle, KA, Zhao, S et al. 1994, 'Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey', *Archives of General Psychiatry*, vol. 51, pp. 8–19.

Kitzrow, MA 2003, 'The mental health needs of today's college students: challenges and recommendations', *NASPA Journal*, vol. 41, no. 1, pp. 167–181.

López León, S, Croes, EA, Sayed-Tabatabaei, FA et al. 2005, 'The dopamine D4 receptor gene 48-base-pair-repeat polymorphism and mood disorders: a meta-analysis', *Biological Psychiatry*, vol. 57, no. 9, pp. 999–1003.

López-León, S, Janssens, AC, Gonzalez-Zuloeta Ladd, AM et al. 2008, 'Meta-analysis of genetic studies on major depressive disorder', *Molecular Psychiatry*, vol. 13, pp. 772–785.

Lyness, JM, Heo, M, Datto, CJ et al. 2006, 'Outcomes of minor and subsyndromal depression among elderly patients in primary care settings', *Annals of Internal Medicine*, vol. 144, no. 7, pp. 496–504.

McLennan, J 1992, '"University blues": depression among tertiary students during an academic year', *British Journal of Guidance and Counselling*, vol. 20, pp. 186–192.

Mirescu, C & Gould, E 2006, 'Stress and adult neurogenesis', *Hippocampus*, vol. 16, pp. 233–238.

Murray CJL & Lopez, AD 1997, 'Alternative projections of mortality and disability by cause 1990–2020: global burden of disease study', *Lancet*, vol. 349, pp. 1498–1504.

Mykletun, A, Bjerkeset, O, Overland, S et al. 2009, 'Levels of anxiety and depression as predictors of mortality: the HUNT study', *British Journal of Psychiatry*, vol. 195, pp. 118–125.

Nutt, D 2004, 'Anxiety and depression: individual entities or two sides of the same coin?', *International Journal of Psychiatry in Clinical Practice*, vol. 8, pp. 19–24.

Schaefer, A, Brown, J, Watson, C et al. 1985, 'Comparison of the validities of the Beck, Zung and MMPI depression scales', *Journal of Consulting and Clinical Psychology*, vol. 53, pp. 415–418.

Scott, L & O'Hara, MW 1993, 'Self-discrepancies in clinically anxious and depressed university students', *Journal of Abnormal Psychology*, vol. 102, pp. 282–287.

Sharpley, C, Bitsika, V & Christie, DRH 2007, 'Causal "mapping" of depression among prostate cancer patients: a preliminary interview study', *Journal of Men's Health & Gender*, vol. 4, pp. 402–408.

Sharpley, C & Christie, D 2007a, 'An analysis of the psychometric structure and frequency of anxiety and depression in Australian men with prostate cancer', *Psycho-Oncology*, vol. 16, pp. 660–667.

Sharpley, C & Christie, D 2007b, '"How I was then and how I am now": current and retrospective self-reports of anxiety and depression in Australian women with breast cancer', *Psycho-Oncology*, vol. 16, pp. 752–762.

Sharpley, C & Rogers, H 1985, 'Naïve versus sophisticated item-writers for the assessment of anxiety', *Journal of Clinical Psychology*, vol. 41, pp. 58–62.

Sharpley, C, Tanti, A, Stone, J & Lothian, P 2004, 'The "Effects of Life Events" inventory', *Counselling Psychology Quarterly*, vol. 17, pp. 45–52.

Tabachnick, B & Fidell, L 1996, *Using multivariate statistics*, Harper Collins, New York.

Tanaka, J & Huba, G 1987, 'Assessing the stability of depression in college students', *Multivariate Behavioral Research*, vol. 22, pp. 5–19.

Tjia, J, Givens, JL & Shea, JA 2005, 'Factors associated with undertreatment of medical student depression', *Journal of American College Health*, vol. 53, no. 5, pp. 219–224.

Ustun, TB, Ayuso-Mateos, JL, Chatterji, S, Mathers, C & Murray, CJL 2004, 'Global burden of depressive disorders in the year 2000', *British Journal of Psychiatry*, vol. 184, pp. 386–392.

WHO 2001, 'Cross-national comparisons of the prevalences and correlates of mental disorders: WHO International Consortium in Psychiatric Epidemiology', *Bulletin of the World Health Organisation*, vol. 78, pp. 413–426.

Zinbarg, RE, Barlow, DH, Liebowitz, M et al. 1994, 'The DSM-IV field trial for mixed anxiety-depression', *American Journal of Psychiatry*, vol. 151, no. 8, pp. 1153–1162.

Zung, W 1965, 'A self-rating depression scale', *Archives of General Psychiatry*, vol. 12, pp. 63–70.

Zung, W 1971, 'A rating instrument for anxiety disorders', *Psychosomatics*, vol. 12, pp. 371–379.

Zung, W 1973, 'From art to science: the diagnosis and treatment of depression', *Archives of General Psychiatry*, vol. 29, pp. 328–337.

Zung, W 1980, *How normal is anxiety?* Upjohn, Durham, NC.