Running head: PERCEIVED ACADEMIC PERFORMANCE, DEPRESSION, ANXIETY

AND STRESS



An investigation into the relationship between perceived academic performance, depression,

anxiety, and stress; gender differences.

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Abstract

Aims: The current study aimed to provide a greater understanding of the relationships between perceived academic performance, depression, anxiety, and stress within the population of third level education population in Ireland. Another aim was to gain insight into gender differences present within these relationships and gender differences within reporting experiencing depression, anxiety, and stress.

Methods: A questionnaire was administered to participants (n= 236) which evaluated their perceived academic performance using the perceived academic performance scale and their experiences of depression, anxiety and stress symptoms, using a condensed version of the depression, anxiety, and stress scale (DASS-21).

Results: Results showed that perceived academic performance is negatively correlated with depression, anxiety, and stress within the population as a whole, with females reporting a negative correlation with depression, anxiety, and stress while males only report a negative correlation with depression. Statistically significant differences were found only in mean anxiety and stress symptom scores between males and females, with males tending to report lower stress and anxiety scores than females.

Conclusion: The results of the present study provide support to prior research within a novel population. Findings have important practical implications concerning student support services.

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Literature Review

Mental health issues are prevalent across the general population, with studies reporting on average a forty percent lifetime prevalence rate (de Graaf, Ten Have, van Gool, & van Dorsselaer, 2012; Kessler et al., 2007). Common mental health issues include depression and anxiety, both of which can be aggravated by stress (van Ballegooijen, Riper, Cuijpers, van Oppen, & Smit, 2016; Maercker et al., 2013). Stress is a physical or psychological reaction to a stressor, which can influence how an individual may feel and act (APA, 2019). Anxiety is regarded as feeling apprehensive and tense when anticipating situations of danger, threat or hardship approaching (APA, 2019). Depression is a state of negative affect which ranges from being unhappy to extreme experience of sad, pessimistic moods which cause interference with daily tasks (APA, 2019). Gender differences in the reporting of these mental health issues are commonly seen.

Gender as a risk factor for mental health

Being female is a relatively consistent risk factor which has been identified for experiencing stress, anxiety and depression throughout much of the literature (Wahed & Hassan, 2017; Shamsuddin et al., 2013; Iqbal, Gupta & Venkatarao, 2015; Kulsoom & Afsar, 2015; Desouky & Allam, 2017). Within a college population, females reported experiencing lower mental health quality compared to males, with females reporting greater levels of depression, anxiety, and stress (Soysa & Wilcomb, 2015). While most studies report these higher levels among females, one study however, reported some contradicting findings; they found that depression was more prevalent within males, although similarly their findings did concur that anxiety is more prevalent within females (Gao, Ping and Liu, 2020). Perhaps this inconsistent finding was due to an imbalance of male to female participants as within this particular study there were ninety-six more males than females whereas within the previously mentioned studies the samples consisted of a greater number of female participants than males. The current research will focus on gender differences with the aim of addressing this inconsistency by aiming to attain a more gender balanced sample. In epidemiological studies anxiety and mood disorders are continuously found to be two to three times more prevalent in females than male (Leibenluft, 1999). Early research suggests gender roles caused woman to be more likely to experience emotional issues than males, as at the time females were typically socially expected to stay at home exposing them to greater frustration with household workload, less opportunities for success and less gratifying and acknowledged work (Gove & Tudor, 1973). Subsequent recent search suggests traditional gender selfconcepts may have an influence on the development of these emotional issues, while traditionally it was thought a balance of high masculinity and high femininity was beneficial for physiological wellbeing, high levels of masculinity have since been found to be associated with positive mental wellbeing (Taylor & Hall, 1982). Additionally more recent potential causes of this prevalence within females have been suggested not to be linked with a predisposition to developing these issues but may potentially be linked to physiological factors such as psychosocial factors and sex hormones, with increases in depression being seen within females at onset of menstruation and menopause (Parker & Brotchie, 2010). Alongside females, university students have also been identified as a population with high levels of stress, anxiety, and depression symptoms.

Mental health of university students

High prevalence rates of depression, anxiety, and stress in university students are consistently reported, with between forty and sixty seven percent of students admitting experiencing at least one of these issues (Bayram & Bilgel, 2008; Wahed & Hassan, 2017; Iqbal, Gupta & Venkatarao, 2015; Kulsoom & Afsar, 2015). Levels of psychological distress experienced by university students is significantly higher than that of the general population, while lower levels of psychological well-being are also experienced by those within the university student population compared to the general population (Stallman, 2010, Cooke et al., 2006). There is increased concern worldwide for the mental health of university students, with the number of university students experiencing mental health issues growing significantly (Kadison, & Digeronimo, 2004; Storrie, Ahern & Tuckett, 2010). 18.5% of the population of Ireland have been diagnosed with a mental illness, this is one of the highest rates of mental health conditions within Europe, therefore understandably Irish universities have noted an increase of 127% for students enrolling with disability services due to mental health over the last five years, with 21% of these meeting the criteria for severe or very severe depression and 26% meeting the criteria for severe or very severe anxiety (Higher Education Authority, 2020). A potential reason for this increase has been suggested to be linked to the current encouragement of all individuals, from all backgrounds to attend university which can contribute to added financial complications for the individuals, whereas previously only privileged individuals with financial and family support would have attended university (Royal College of Psychiatrists, 2011). A shared concern among many students is academic performance.

Perceived academic performance

Academic performance is defined as the product of education, it explains the degree to which a student has accomplished their educational aims (Arshad, Zaidi & Mahmood, 2015, p. 160). Academic performance is one of the main concerns for university students (Beiter et al., 2015). Anxiety levels within university level females were associated with their academic performance (Gao, Ping & Liu, 2020). A student's perceived academic performance has been found to reflect their actual academic performance, with students scoring higher in self-perceived academic competence attaining higher grades (Lindner, 1999). Perceived academic control has been found to be a positive predictor of academic achievement and a negative predictor of anxiety (Respondek, Seufert, Stupnisky & Nett, 2017). Only students who perceived themselves to be failing academically, and not those who had actually received a fail had positive associations with stress, meaning that there was a positive association found between negatively perceived academic performance and stress, this indicates that perception and appraisal are more significant antecedents of stress than the actual negative event itself (Lee, 2017). Different factors can have an influence on an individual's perceived academic performance, feeling lonely and experiencing academic burnout have been found to have a negative effect on students' perceived stress and academic performance (Stoliker & Lafreniere, 2015), while support services and academic activities have been found to have a positive effect on students' academic performance (Amenkhienan & Kogan, 2004). Both an individual's perceived academic performance and their quality of mental health can have an interacting effect with each other.

Interaction between mental health and perceived academic performance

The state of an individual's mental health can consequentially impact their academic performance (Flook, Repetti & Ullman, 2005). Inversely, low academic performance within college students can impact the individual's mental health (Ahmed & Julius, 2015). Poor academic performance was found to be associated with high stress levels, high anxiety levels and high depression levels (Jahan, Siddiqui, Mitwally, Al Zubidi, & Al Zubidi, 2016; Vitasari, Wahab, Othman, Herawan & Sinnadurai, 2010; Eisenberg, Golberstein & Hunt, 2009). Similarly, depression, anxiety and stress have been found to be negatively correlated with academic performance, with higher stress levels being associated with lower academic performance (Khan, Altaf & Kausar, 2013). High rates of poor mental health and negative effects on their academic performance were reported by university students (Wyatt, & Oswalt, 2013). Experiencing depression during a university course predicted decreased exam performance (Andrews & Wilding, 2004). Depression, anxiety, and stress were found to be the top three factors which students reported to have had an effect on their academic

performance within the previous twelve months (American College Health Association, 2018). Perceived academic performance has been linked with serious mental health outcomes, with individuals reporting to be failing, in terms of perceived academic performance, are five times more likely to engage in a suicide attempt compared to those with above average perceived academic performance (Richardson, Bergen, Martin, Roeger & Allison, 2005). All of the research discussed focuses on populations around the world excluding Ireland, this gap could potentially be interesting to address.

An Irish population

The existing research focuses on other populations from all over the world, however there is a lack of research focusing on depression, anxiety, stress, perceived academic performance and gender differences within an Irish University population. The effects reported by other populations from other countries worldwide are not necessarily generalizable to an Irish population as there are cultural and academic differences between Ireland and these other countries.

Ireland has a different culture to the other countries where existing research has occurred, these cultural differences could potentially lead to alternative findings within an Irish population. Culture exists within societies, forming personality traits, problem-solving strategies, affects thought processes, and has an influence on lifestyle choices (Chu & Reeves, 2000). Cultural diversity is defined as "the existence of societies, communities, or subcultures that differ substantially from one another" (APA, 2019). Cultural differences can influence the way in which an individual perceives and generates goals, with research finding higher levels of goals reported within an Asian population when compared to their Australian counterparts (Volet, S. E., & Renshaw, P. D. (1995). Religious differences have also been identified, with Asian students experiencing increased mental and social quality of life by using religion as a coping strategy, unlike the European students who did not use religion as a coping mechanism (Chai, Krägeloh, Shepherd & Billington, 2012). Cultural differences have been seen to have an influence on the strategies in which a student chooses to use in their learning and studies, with environmental factors also having an influence, Japanese students were seen to select learning methods in line with their cultural belief of persistence throughout adversity (Purdie & Hattie, 1996). Differences within education systems may also be a provide an account as to why of the existing research may not be applicable to an Irish population.

Education systems, both at school and university levels, differ across different countries (Pfeffer, 2015) as do learning styles (Heffernan, Morrison, Basu & Sweeney, 2010). School levels of education are also important to address as this is creates the foundation of learning and is where the examinations occur which are needed to gain access to university (Madaus & Kellaghan, 1991). Important differences which occur across the world which can have an effect on an individual's learning include variations in examination systems, incentives for both the teacher and students' performance, availability of extra support available for students, quality of the teacher workforce and size of the class (Woessmann & West, 2006). An Irish population may potentially generate alternative findings to existing research as different structures in regard to schooling, curriculums, assignments and examinations are used in other countries, creating issues with generalisability of the existing research to an Irish population (West, Stokes & Edge, 1999). Ireland has one of the highest levels of engagement in second and third level education, in both second and third level, among member countries of the Organisation for Economic Co-operation and Development (Leddin and Walsh 1998; OECD, 1997). Although this is a positive achievement for the Irish education system, this creates competition for places within Irish further education systems and workplaces and creates additional stress for students (Smyth & Banks, 2012).

Overall, this review of the existing literature provides an account of the relationships between depression, anxiety, stress, and perceived academic performance and the gender differences within the reporting of depression, anxiety, and stress within students at university level. Much of the research suggests that being female is a risk factor for experiencing depression, anxiety, and stress. Additionally, depression, anxiety and stress are variables which have been associated with negative effects on a perceived student's academic performance. A gap which has been identified within the existing research is the lack of attention to an Irish university student population, as much of the research occurred in other parts of the world and focused on samples of other nationalities.

Rationale

The rationale for the current study is that there is no existing research which addresses all of the variables within the current study, which are depression, anxiety, stress, perceived academic performance and gender, within an Irish university level population. Previous research suggests that future research on these topics addressing different nationalities would be beneficial (Lu et al., 2018). The current research will focus on the population of individuals attending an Irish college or university to address this gap within the existing research.

An implication of the current research is that by understanding the stress and mental health difficulties which are arising within the Irish university student population the universities can provide helpful health education programs to support their students (Wyatt, & Oswalt, 2013). Further implications are by understanding a potential gender difference priority support provided for those categorised as at risk may be beneficial (Özdin & Bayrak Özdin, 2020).

Aims, Questions and Hypothesis

The current research aims to investigate if there is a relationship between the prevalence of stress, anxiety and depression symptoms experienced by university students and their perceived academic performance, and to determine if there is a gender difference within these relationships. Additionally, the current research aims to determine if there is a gender difference in reported levels of self-reported stress, anxiety, and depression.

The research questions and hypothesises for the current study are as follows: RQ1: Is there a relationship between levels of stress, anxiety and depression symptoms and perceived academic performance?

H1: There will be a relationship between levels of stress, anxiety and depression symptoms and perceived academic performance.

RQ2: Is there a gender difference in the reporting of higher levels of stress, anxiety, and depression?

H2: There will be a gender difference in the reported levels of self-reported stress, anxiety, and depression.

RQ3: Does perceived academic performance have a greater association with depression, anxiety, and stress symptoms in females?

H3: There will be a greater association between perceived academic performance and depression, anxiety and stress symptoms reported by females when compared to males.

Operational Definitions

Depression, anxiety, and stress symptoms were measured using a questionnaire called the DASS-21, which is a condensed version of the DASS-42. This questionnaire addresses each of these subgroups simultaneously. A score is generated for each subgroup. A higher score indicates higher levels of depression, anxiety, or stress accordingly. Perceived academic performance was measured using a questionnaire, which was made up of five questions called the perceived academic performance scale. A higher score indicates higher levels of positively perceived academic performance.

Age, gender, and student status were measured through self-reported responses.

Method

Participants

The total number of participants recruited for the current study was 237 participants, 137 of which were female, while 100 were male, however, due to excessive missing values one of the participants had to be excluded from data analysis. Therefore, the research sample within the current study comprised of 236 participants, 136 of which were female, while 100 were male, all of these participants were included in the data analysis. Participants were aged between 18 and 50, with a mean age of 20.88. All participants were students attending third level education in Ireland at time of data collection. Initially participants were recruited through convenience sampling via the researcher's social media accounts (Instagram, Snapchat, and Facebook). Due to a difficulty with recruiting a similar ratio of males to females, the questionnaire was closed to females after a number of weeks and the additional male participants were recruited through snowball sampling and self-selection. In accordance to ethics participants must be over eighteen and must provide informed consent, following completion of reading the study information sheet and the consent form (see appendix A, B and C for full details). In order to address the current research question, participants must also be currently enrolled in a college or university course. Additionally, participants demographic information was also collected to gather data in relation to the participants age, gender, and student status (see appendix D for full details).

Measures

Perceived academic performance scale

The perceived academic performance scale measures an individual's perception of their academic performance through the following questions; "I meet the official performance requirements expected out of a student", "I adequately complete assigned duties", "I fulfil responsibilities specified in the course outline", "I perform tasks that are expected of me" and "My performance is beyond demands" (Verner-Filion & Vallerand, 2016). Each question was measured on a seven-point Likert scale ranging from 1 "do not agree at all" to 7 "very strongly agree" (see appendix E for full details). The maximum score possible to attain using this scale is 35 and the minimum score is 5. Higher scores reflect a higher level of positively perceived academic performance. The perceived academic performance scale has been reported to be a valid measure of the construct; perceived academic performance, with a confirmatory factor analysis showing support for the model (Verner-Filion & Vallerand, 2016). The internal reliability of the scale was studied twice and was found to acceptable in both studies with a Cronbach's Alpha of 0.83 in the first study and 0.87 in the second study (Verner-Filion & Vallerand, 2016). Both of these figures are above the acceptable Cronbach's alpha level of 0.7 which indicates that the perceived academic performance scale has good internal consistency. Within the current sample, a Cronbach's alpha of 0.839 was generated for the perceived academic stress scale, this indicates a high level of internal consistency for this scale with the current sample.

Depression anxiety and stress scale (DASS-21)

The condensed depression anxiety and stress scale consists of twenty-one questions, each addressing either depression, anxiety, or stress (Lovibond & Lovibond, 1995). Each item was measured on a four-point Likert scale ranging from 0 "did not apply to me at all" to 3 "applied to me very much or most of the time" (see appendix F for full details). Scores are then multiplied by two in order to calculate the final scores for each subgroup. The maximum total score of each subscale is 21 and the minimum score is 0. Higher scores indicate higher levels of depression, anxiety, or stress symptoms. The condensed depression anxiety and stress scale (DASS-21) is a well-established and valid measure. A number of studies which evaluate the validity of the DASS-21 have reported this measure to have sufficient construct validity, meaning it is a valid instrument to be used to measure depression, anxiety and stress (Alfonsson, Wallin & Maathz, 2017; Dahm, Wong & Ponsford, 2013; .Henry & Crawford, 2005; Lee, 2019; Ng et al., 2007). Imam (2008) found high internal consistency reliability figures the DASS-21, these values were 0.79 for the depression subscale, 0.70 for the anxiety subscale, 0.76 for the stress subscale, and 0.89 for the full scale. Similarly, Saricam (2018) found acceptable internal consistency with a Cronbach alpha of 0.87 for the depression subscale, 0.85 for the anxiety subscale, 0.81 for the stress subscale. All of these Cronbach's alphas reach or surpass the acceptable level of 0.7 indicating that the DASS-21 has good internal consistency. Within the current sample, a Cronbach's alpha of 0.935 was generated for the DASS-21 as a whole, with depression, anxiety, and stress subscales reporting Cronbach's alphas of 0.889, 0.846, 0.860 and respectively. These scores are all indicative a high level of internal consistency for this scale with the current sample.

Demographics

Demographics such as age, gender and student status were measured using selfreported responses to questions addressing these constructs.

Design

The current research takes the form of a quantitative research design as a questionnaire was used for data collection. The current study involved observational methods in the form of a cross-sectional research design. A cross-sectional design will be used to explore the relationships between the variables at a single time point. The cross-sectional design will feature multiple variables making it a multivariate design.

As the current study is a quantitative study statistical analysis is appropriate for the analysis of the data. SPSS will be used to analyse the data. Standard multiple regression was the analysis used for the first research question; is there a relationship between levels of stress, anxiety and depression symptoms and academic performance? Standard multiple regression was used in this case as this research question addresses relationships between variables and the criterion variable is continuous. The predictor variables are depression, anxiety, and stress. The criterion variable is perceived academic performance.

An independent samples t-test was used for the second research question; is there a gender difference in the reporting of higher levels of stress, anxiety, and depression? An independent samples t-test was used in this case as this research question addresses gender differences and because there are two groups that participants fall into: male or female. The independent variable is gender. The dependant variable is perceived academic performance.

Standard multiple regression was the analysis used for the third research question; does perceived academic performance have a greater association with depression, anxiety, and stress symptoms in females? Standard multiple regression was run after splitting the file by gender in order to find any gender differences. Standard multiple regression was used in this case as this research question addresses relationships between variables and the criterion variable is continuous. The predictor variables are depression, anxiety, and stress. The criterion variable is perceived academic performance.

Procedure

Data was collected through an online google forms questionnaire. The survey was shared with participants through the researcher's social media accounts (Instagram, Facebook, and Snapchat) and by a link to the survey shared either by the researcher directly or other participants. When the participants decided to access the link to take part in the study, they first had to read the study information sheet explaining the nature of the study and read the consent form (see appendix A and B for full details). Then the participants had to tick two boxes in order to be allowed to proceed with the survey, one to ensure that they are over eighteen and another to provide informed consent to take part in the current study (see appendix C for full details). The whole process took the participants an estimated five minutes to complete. Participants were not be offered breaks as the survey is short, however the survey is taken at the participants own pace, with no time limit put on the participant whilst completing this questionnaire.

The questionnaire was made up of three sections. The first section was demographic questions which were collected as some of the demographic questions provided necessary information to address the research questions and in order to allow for generalizability of the results. The second section was the perceived academic performance scale, this scale measures the participants perception about their own performance in relation to their college workload (Verner-Filion & Vallerand, 2016). The third section of the survey involved completion of the condensed depression anxiety and stress scale (DASS-21), this scale is a combination of three subscales; depression, anxiety and stress subscales which provide an independent score for each subscale that represents the severity of depression, anxiety and stress symptoms which have been experienced by the participant within the previous week (Lovibond & Lovibond, 1995). Within each of these questionnaire's participants had to select the answer within the google form survey which they felt most reflected their own recent experiences. Once the participant had completed all of the questions within the survey and they felt comfortable to submit their responses, they then had to click the submit button in order for their responses to be collected. By doing so, this would then have brought them to a debrief page, providing them with a summary of the intentions of the study and a number of places to get support should they experience distress as a result of completing the questionnaire (see appendix G for full details).

Ethical considerations

The data was collected in accordance with NCI ethical guidelines. The research was deemed ethically sound by the ethics committee within NCI prior to data collection. All risks associated with engaging in the study were clearly highlighted within the information sheet and no incentive was provided to take part (see appendix A for full details). All participants had to provide informed consent in order to proceed with the questionnaire, this was communicated to the participants within the consent form (see appendix B and C for full details). Sources of support, such as Mental Health Ireland, the Samaritans and aware, were provided within the debriefing form in the form of contact details to these services for those that experienced distress as a result of taking part in the study (see appendix G for full details).

Results

Descriptive Statistics

The sample consisted of 236 participants (n=236), made up of 136 (57.6%) females and 100 (42.4%) males, all of which were currently enrolled in a university or college course in Ireland at the time when they completed the questionnaire. Further descriptive statistics can be found in the table below (table 1).

Table 1

Descriptive statistics for age, perceived academic performance, depression, anxiety, and

Variable	п	M [95% CI]	SD	Range
Age	236	20.88 [20.43-21.42]	4.23	18-50
Academic performance	235	26.00 [25.35-26.66]	5.10	9-35
Depression	234	8.18 [7.50-8.87]	5.32	0-21
Anxiety	235	6.81 [6.19-7.44]	4.88	0-21
Stress	234	9.87 [9.23-10.51]	4.96	0-21

Inferential Statistics

Multiple regression analysis was performed to determine how well academic performance levels could be explained by three variables including depression, anxiety, and stress. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable included in the study were examined (see Table 2 for full details). Three of the three predictor variables were significantly correlated with the criterion variable, and these significant effects ranged from r = -.15 (stress) to r = -.24 (depression). The correlations between the predictor variables were also assessed with r values ranging from .65 to .72. Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis.

Table 2

Correlations between variables included in the model

Variable	1	2	3	4
1. Perceived AP	-			
2. Depression	24***	-		
3. Anxiety	16**	.65***	-	
4. Stress	15*	.70***	.72***	-

Note: **p* < .05; ***p* < .01; ****p* < .001

Since no a priori hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the analysis. The three predictor variables explained 5.9% of variance in perceived academic performance levels (F(2, 228) = 4.80, p = .003). One of the three variables were found to uniquely predict perceived academic performance levels to a statistically significantly level: depression (β = -.24, p = .007) (see Table 3 for full details).

Table 3

Variable	R ²	В	SE	β	t	р
Model	.059**					
Depression		24	.09	25	-2.70	.007
Anxiety		04	.10	04	38	.705
Stress		.05	.11	.05	.51	.611

Multiple regression model predicting perceived academic performance scores

Note: **p* < .05; ***p* < .01; ****p* < .001

An independent samples t-test was conducted to compare levels of depression, anxiety and stress between males and females. There was a significant difference in scores for anxiety, with males (M = 5.75, SD = 4.40) scoring significantly lower than females (M = 7.60, SD = 5,09), t(233) = 2.92, p =.004, two-tailed. The magnitude of the differences in the means was small (Cohen's d = .39). There was a significant difference in scores for stress, with males (M = 8.70, SD = 5.09) scoring significantly lower than females (M = 10.71, SD = 4.71), t(232) = 3.11, p =.002, two-tailed. The magnitude of the differences in the means was small (Cohen's d = .41). There were no significant differences between groups for depression scores (p=0.25) (see table 4 for full details).

Table 4

Group differences between males and females for depression, anxiety, and stress symptoms

		Male		Fe	emale						
	М	SD	п	М	SD	n	t	df	р	95% CI	Cohens d
Depression	7.71	5.53	98	8.52	5.15	136	1.15	232	.252	58-2.19	•
Anxiety	5.75	4.40	100	7.60	5.09	135	2.92	233	.004	.60-3.10	0.39
Stress	8.70	5.09	98	10.71	4.71	136	3.11	232	.002	.74-3.28	0.41

There was no statistically significant difference in mean depression symptom scores between males and females. There was a statistically significant difference in mean anxiety and stress symptom scores between males and females. Results show that males tend to have lower stress and anxiety scores than females.

Multiple regression analysis was performed to determine how well perceived academic performance levels could be explained by three variables including depression, anxiety, and stress levels within female participants. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable included in the study were examined (see Table 5 for full details). All of the three predictor variables were significantly correlated with the criterion variable, and these significant effects ranged from r = -.17 (anxiety) to r = -.25 (depression). The correlations between the predictor variables were also assessed with r values ranging from .65 to .71. Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis.

Table 5

Variable	1.	2.	3.	4.
1. Academic performance	-			
2. Depression	25**	-		
3. Anxiety	17*	.65***	-	
4. Stress	23**	.67***	.71***	-

Correlations between variables included in the model within females

Note: **p* < .05; ***p* < .01; ****p* < .001

Since no a priori hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the analysis. The three predictor variables explained 7.2 % of variance in perceived academic performance levels (F(3, 131) = 3.39, p = .02). None of the three variables were found to uniquely predict perceived academic performance levels to a statistically significantly level (see Table 6 for full details).

Table 6

Multiple regression model predicting perceived academic performance scores within females

Variable	R ²	В	SE	β	t	р
Model	.072*					
Depression		20	.13	19	-1.58	.117
Anxiety		.06	.14	.06	.47	.642
Stress		17	.15	15	-1.13	.261

Note: **p* < .05

Multiple regression analysis was performed to determine how well perceived academic performance levels could be explained by three variables including depression, anxiety, and stress levels within male participants. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable included in the study were examined (see Table 7 for full details). One of the three predictor variables were significantly correlated with the criterion variable, r = -.23 (depression). The correlations between the predictor variables were also assessed with *r* values ranging from .65 to .74. Tests for multicollinearity also indicated that all Tolerance and VIF values were in an acceptable range. These results indicate that there was no violation of the assumption of

multicollinearity and that the data was suitable for examination through multiple linear regression analysis.

Table 7

Correlations between variables included in the model within males

Variable	1.	2.	3.	4.
1. Academic performance	-			
2. Depression	23*	-		
3. Anxiety	16	.65***	-	
4. Stress	03	.74***	.73***	-

Note: p < .05; p < .01; p < .01

Since no a priori hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the analysis. The three predictor variables explained 11.1 % of variance in perceived academic performance levels (F(3, 92) = 3.81, p =.013). Two of the three variables were found to uniquely predict perceived academic performance levels to a statistically significantly level: depression (β = -.40, p =.009), and stress (β = .41, p = .017) (see Table 8 for full details).

Table 8

Variable	R ²	В	SE	β	t	р
Model	.111*					
Depression		33	.12	40	-2.68	.009
Anxiety		21	.16	20	-1.33	.188
Stress		.37	.15	.41	2.44	.017

Multiple regression model predicting perceived academic performance scores within males

A comparison of the results of the correlational and regression analyses provides insight into the differential effects of depression, anxiety, and stress on the of academic performance of males and females. For females, perceived academic performance is significantly negatively associated with anxiety (.025), stress (.003) and depression (.002); with the relationship with depression being the most significant. For males, perceived academic performance is only significantly negatively correlated with depression (.012) and the relationship is not as strong as it is for females.

Discussion

The aim of the current study was to provide a greater understanding of the relationships between perceived academic performance, depression, anxiety, and stress within the population of students who are attending an Irish college or university. The current research also sought to gain an awareness of the gender differences that exist within these relationships as well as to gain an insight into the gender differences that occur within the reporting of experiencing depression, anxiety, and stress.

In support of the first hypothesis, results show that all three of the predictor variables, depression, anxiety, and stress were found to be significantly correlated with the criterion variable, perceived academic performance. The second hypothesis was somewhat supported, with results showing that there was a statistically significant difference in mean anxiety and stress symptom scores between males and females with males tending to report lower stress and anxiety scores than females. However, results also found that there was no statistically significant difference in mean depression symptom scores between males and females. In support of the third hypothesis, results show that for females, perceived academic performance is significantly negatively associated with depression, anxiety, and stress; with the relationship with depression being the most significant. However, for males, perceived academic performance is only significantly negatively correlated with depression and this relationship is not as strong as it is for females.

Findings addressing gender differences within the reporting of depression, anxiety, and stress are somewhat consistent with existing research however there are discrepancies. A number of studies suggest that being female is a relatively consistent risk factor developing depression, anxiety, and stress (Wahed & Hassan, 2017; Shamsuddin et al., 2013; Iqbal, Gupta & Venkatarao, 2015; Kulsoom & Afsar, 2015; Desouky & Allam, 2017), however in light of the current findings it could be suggested that while this may be true for anxiety and stress there were no differences in the reporting of experiencing depression between males and females, this would indicate that the female risk factor concept may not be applicable for depression. Similarly, Soysa and Wilcomb (2015) found that within a sample of university students females reported having higher levels of stress, anxiety, and depression, the current findings provide support for the first two constructs. However, simultaneously the current findings do not provide support for this gender difference within the reporting of depression. Interesting an alternative study found contradictory evidence to the previous studies, finding that within their sample the prevalence of depression was greater in males than females, however this study does not provide support to these findings either (Gao, Ping and Liu, 2020). The current study concurs with much of the research indicating that there is a difference in anxiety, stress levels experienced between males and females with males experiencing lesser levels than females, however simultaneously contradicts existing research which suggests that males experience higher or lower levels of depression than women. Further research would be beneficial, perhaps with larger sample sizes, to address this inconsistency with the prior research, larger sample sizes allow for more accurate effect size estimation, greater representation of the sample and greater ability to generalise the results.

Findings addressing the correlations between depression, anxiety, stress, and perceived academic performance are consistent with existing research. The findings of the current study provide support to prior research which similarly found depression, anxiety and stress to be negatively correlated with academic performance as well as research which found poor academic performance to be associated with high stress, anxiety, depression levels (Jahan, Siddiqui, Mitwally, Al Zubidi, & Al Zubidi, 2016; Vitasari, Wahab, Othman, Herawan & Sinnadurai, 2010; Eisenberg, Golberstein & Hunt, 2009; Khan, Altaf & Kausar, 2013; Wyatt, & Oswalt, 2013). Future studies could build upon the consistent correlations found within existing research by investigating the casual relationships that exist between these constructs through the use of a longitudinal research design.

Implications

Findings obtained within the current research have significant practical implications. The current findings highlight that perceived academic performance is negatively correlated with depression, anxiety, and stress within the population as a whole, this corelation was seen for depression, anxiety, and stress within women but only for depression within males. Other gender differences were also identified with males reporting less anxiety and stress than women.

These findings should inform student support services within third level institutes of the need to provide additional support for students struggling with depression, anxiety, and stress symptoms during their time at the third level institute. Individualised support services, such as counselling, should be available to all students, fitting with their individual needs. As well as individual supports, in order to reach the entire student population within the college simultaneously free, accessible workshops and skills training programmes could be run with the aim of providing students with the appropriate coping strategies to deal with their symptoms of depression, anxiety and stress should they arise. Perhaps to address the gender discrepancies additional non-discriminatory supports tailored to women could be introduced such as generating new clubs and societies for women, for example creating a new female sports team could help to relieve their symptoms (Guarin, 2018).

Additionally, as the results show that for women experiences of depression, anxiety, and stress symptoms are correlated with negative perceived academic performance, which is also seen within males experiencing depression symptoms, it would be beneficial for colleges to provide additional academic support for students who are experiencing these symptoms in order to help these students to achieve their maximum potential despite their symptoms. The psychological implications that students have reported experiencing should not be ignored, as it is evident that student's experiences of negative mental health experiences are negatively associated with perceived academic performance. Students attend a course in order to attain a qualification, therefore positive academic performance is central to the student's achievement. Consequently, this negative association between perceived academic performance and depression, anxiety, and stress highlights the disadvantage the students that are experiencing these symptoms are facing. Hence, students who are suffering with depression, anxiety, and stress supported both psychologically and academically in order to alleviate this disadvantage.

The current study is a good foundation for further research. Further research exploring the causal relationship between academic performance and depression, stress, and anxiety symptoms would be beneficial. Longitudinal research might be needed in order to investigate the direction of this relationship; depression, anxiety and stress may impact academic performance however academic performance may also impact depression, anxiety, and stress.

Strengths and Limitations

A strength of the current study is that it attempts to build upon existing research in a novel way. To the researcher's knowledge, there are no existing studies, which address depression, anxiety, stress, perceived academic performance and gender differences within an Irish University population. The current study found somewhat similar results within the population of individuals attending Irish third level institutes to results found within similar populations across the globe.

A number of limitations exist within the present study. Firstly, the scale used to measure perceived academic performance may not have measured this variable as accurately as possible. Despite this scale having an acceptable Cronbach's Alpha indicating satisfactory reliability, the scale only consisted of 5 items (Verner-Filion & Vallerand, 2016). It could be argued that this scale was not comprehensive enough to accurately generate a realistic score for perceived academic performance. Future studies may benefit by using an alternative scale with a greater number of items to address every feature of this construct in order to attain more accurate results.

Secondly, the current study depended entirely on self-reported measures. Despite participants being anonymous, self-reported measures can still be vulnerable to social desirability bias, which causes individuals to select the answer they feel will cause them to be viewed more favourably by others rather than the actual most applicable answer to them. Perhaps further research could use a longitudinal research design in order to generate more reliable measures and to investigate causal relationships which may exist between the variables.

An additional limitation of the current study is that as the study involved a cross sectional research design to obtain the results causality cannot be inferred. However, understanding causality is not necessary within the current study, as the aim of the current study was to determine whether or not the relationships of interest exist, not to determine causal factors. To progress further from the current study, future research could focus on utilising a longitudinal research design in order to have the ability to infer causation between these variables of interest.

Another limitation of the current study is that there were fewer male participants recruited than females. The current sample was made up of 136 females and 100 males. However, to address this gap a Levene's Test was run in order to determine if the two groups had equal variances. Despite the difference in participant group numbers the Levene's Test indicated that the variance between the two groups was not significantly different. This indicates that it was an appropriate and reflective sample to run data analysis with. The final limitation of the current study was the lack of probability sampling, while trying to attain a more even ratio of males to females as indicated above the sampling method was changed from convenience sampling to snowball sampling in order to recruit more male participants and to prevent any more female participants engaging with the questionnaire. This made the current study vulnerable to selection bias as appropriate randomization could not be achieved, indicating that the sample may not be representative of intended the population.

Conclusion

Overall, prior research consistently indicates that depression, anxiety, and stress are negatively associated with perceived academic performance, and the results of the current study provide further support to the existing literature, strengthening the findings of prior research. The current study adds to previous literature by focusing on a novel population; students attending Irish third level institutions. Future studies could benefit from using an alternative measure for the student's academic performance rather than the scale used within the current research which measured the student's perception of their academic performance as this perception is not always necessarily reflective of the student's actual academic achievements. Additionally, further studies using longitudinal research would be beneficial in order to allow for causality within relationships to be inferred. The current study has established that there is a negative correlation between depression, anxiety, stress, and perceived academic performance. Therefore, an investigation into the direction of this relationship would be of interest for progression within this area. These findings have practical implications for student support services within third level institutions, they highlight the need for both psychological support and academic support for those experiencing depression, anxiety, or stress symptoms.

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Appendices

Participant Information Sheet

The relationship between depression, anxiety, stress and perceived academic performance

INVITATION

You are being asked to take part in a research study investigating levels of stress, anxiety and depression symptoms and their relationship with academic performance, and gender differences in the reporting of higher levels of stress, anxiety and depression. My name is Megan Cunningham and I am an undergraduate final year psychology student of The National College of Ireland. The project is has been approved by the Psychology Research Ethics Committee.

WHAT WILL HAPPEN

In this study, you will be asked to answer basic demographic questions, provide a grade average which most accurately represents your overall grade in percentage format, and complete a the depression anxiety and stress scale.

TIME COMMITMENT

The study typically takes five minutes to complete.

PARTICIPANTS' RIGHTS

You have the right to request that any data you have supplied be withdrawn until the point of submission. After this point it is not possible to withdraw from the study as your data is unidentifiable from the other participants. You have the right to refuse to answer any question that is asked of you. You have the right to have your questions about the procedures answered. If you have any questions as a result of reading this information sheet, you should ask the researcher before completing the study.

BENEFITS AND RISKS

Potential unlikely psychological harm could arise during completion of the current study. This questionnaire will address sensitive topics such as depression, anxiety and stress and will include questions like "I couldn't seem to experience any positive feeling at all". Participants who feel that completing the DASS-21 may be distressing for them are advised not to complete the study.

COST, REIMBURSEMENT AND COMPENSATION

Your participation in this study is voluntary. There is no reward offered in return for your participation.

CONFIDENTIALITY/ANONYMITY

The data we collect does not contain any personal information about you. The data will solely be used within the current dissertation. No individual participants will be identifiable. The data will be retained for five years in accordance with the NCI data retention policy.

FOR FURTHER INFORMATION

My supervisor will be glad to answer your questions about this study at any time. You may contact him at fearghal.obrien@ncirl.ie

If you want to find out about the final results of this study, you should contact myself at x18422714@student.ncirl.ie

Appendix A. Participant Information Sheet

Consent Form

In agreeing to participate in this research I understand the following:

This research is being conducted by Megan Cunningham, an undergraduate student at the School of Business, National College of Ireland.

The method proposed for this research project has been approved in principle by the Departmental Ethics Committee, which means that the Committee does not have concerns about the procedure itself as detailed by the student. It is, however Megan's responsibility to adhere to ethical guidelines in their dealings with participants and the collection and handling of data.

If I have any concerns about participation, I understand that I may refuse to participate or withdraw at any stage.

I have been informed as to the general nature of the study and agree voluntarily to participate.

There are potential unlikely risks associated with participation.

All data from the study will be treated confidentially. The data from all participants will be compiled, analysed, and submitted in a report to the Psychology Department in the School of Business. No participant's data will be identified by name at any stage of the data analysis or in the final report.

At the conclusion of my participation, any questions or concerns I have will be fully addressed.

I may withdraw from this study at any time and may withdraw my data at the conclusion of my participation if I still have concerns.

Appendix B. Consent Form

Do you wish to take part in the current research? *
Are you eighteen or over? *

Appendix C. Informed Consent

	Are you currently a university/college student? *
(Yes
(No
Ņ	What age are you? *
-	Short answer text
,	What gender are you *
(Male
(Female

Appendix D. Demographic Questions

PsycTESTS[®]

doi: http://dx.doi.org/10.1037/t58631-000

Perceived Academic Performance Scale

I meet the official performance requirements expected out of a student.

I adequately complete assigned duties.

I fulfill responsibilities specified (e.g., study, homework, readings, papers) in the course outline.

I perform tasks that are expected of me.

My performance is beyond demands.

Note. Items are rated on a 7-point scale, ranging from 1 (do not agree at all) to 7 (very strongly agree).

Appendix E. Perceived Academic Performance Scale

DASS21

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply 1	to me at all
-------------------	--------------

- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree or a good part of time
- 3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

DASS-21 Scoring Instructions

The DASS-21 should not be used to replace a face to face clinical interview. If you are experiencing significant emotional difficulties you should contact your GP for a referral to a qualified professional.

Depression, Anxiety and Stress Scale - 21 Items (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The assumption on which the DASS-21 development was based (and which was confirmed by the research data) is that the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. The DASS-21 therefore has no direct implications for the allocation of patients to discrete diagnostic categories postulated in classificatory systems such as the DSM and ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are as follows:

	Depression	Anxiety	Stress		
Normal	0-9	0-7	0-14		
Mild	10-13	8-9	15-18		
Moderate	14-20	10-14	19-25		
Severe	21-27	15-19	26-33		
Extremely Severe	28+	20+	34+		

<u>NB</u> Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.)Sydney: Psychology Foundation.

Appendix F. DASS-21 Questionnaire and Scoring Instructions

Debrief

Thank you very much for taking the time to participate in the current research.

The purpose of this study is to evaluate if there are relationships between depression, anxiety, stress and perceived academic performance as well as determining if there are gender differences in the levels of depression anxiety and stress is reported within an Irish university population.

Should anyone have experienced distress as a result of participation in the current study the following supports are available:

Mental Health Ireland: https://www.mentalhealthireland.ie Samaritans: https://www.samaritans.org/ireland/samaritans-ireland or Freephone 116 123 Aware: https://www.aware.ie or Freephone 1800 80 48 48

Again thank you for your participation.

Appendix G. Debrief

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📲 Independent Sam		Male (2)	98	7.71	5.533		.559						
	Anxiety	Female (1)	135	7.60	5.089		.438						
		Male (2)	100	5.75	4.398		.440						
	Stress	Female (1)	136	10.71	4.709		.404						
		Male (2)	98	8.70	5.087		.514						
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	Depression	Equal variances assumed		.240	.625	1.148	232	.252	.808	.704	579	2.194	
		Equal variances not assumed				1.134	199.834	.258	.808.	.712	597	2.212	
	Anxiety	Equal variances assumed		1.677	.197	2.917	233	.004	1.850	.634	.600	3.100	
		Equal variances not assumed				2.981	227.461	.003	1.850	.621	.627	3.073	
	Stress	Equal variances assumed		1.962	.163	3.113	232	.002	2.009	.645	.738	3.281	
		Equal variances not assumed				3.074	199.200	.002	2.009	.654	.720	3.298	
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Appendix H. SPSS Output Example