An Investigation of the Relationship Between Perceived Stress Levels and Health Behaviours

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Abstract

Stress and its relationship with coping behaviours is often overlooked. The Lazarus theory explains that coping with stress can occur through many behaviours, but often maladaptive behaviours are more readily available to engage with. This current study seeks to examine the relationship between negative health behaviours and levels of perceived stress within an Irish third-level student population. Cross-sectional convenience sampling acquired a population of 84 participants who completed an online survey of their perceived stress levels along with various health behaviours. Behaviours including binge eating, alcohol consumption, cigarette smoking, and exercise were investigated through methods of statistical analysis. The results found that stress was positively correlated with binge eating yet the other behaviours including alcohol consumption, cigarette smoking, and exercise did not show a significant relationship. Analysis of gender, employment status, age and stress as predictive factors for engagement with negative health behaviours were carried out yet no statistically significant result was present. Future research is necessary to understand the relationship between smoking and stress due to the lack of smokers within this population. Further research within this area can lead to developments in creating appropriate stress interventions for student populations.

Contents

Literature Review

Stress is conceptualised as a state of both psychological and physiological arousal resulting from environmental and emotional factors inducing behavioural attributes (Schuler, 1980). Understood as construct that is difficult to define, stress is known to have a direct impact on the human experience amongst the average individual (Lupien, McEwen, Gunnar & Heim, 2009). This state of arousal influences cognitions that can lead to various results (Freedy & Hobfoll, 2017) which occur from both emotional and environmental stimuli (Lykkegaard, Rosendal, Brask, Brandt, & Prior, 2018). Overall, stress is a response to external stimuli both behaviourally and physiologically stemming from the innate system of "fight or flight" response (Taylor et al., 2000). Individual response often differs yet allowance for cognitive development regarding coping cognitions is evidence within the literature (Monroe, 2008).

Often expressed through self-report studies, physiological response from stress evokes experiences of heightened heart rate, perspiration, respiration and cognitive factors (Norvell, Belles, & Hills, 1988). Similarly, stress exhibits psychological elements such as frustration and agitations whilst feeling overwhelmed (Erbas et al., 2018). Both responses to stress occur simultaneously and many mechanisms process information biologically and cognitively when exposure occurs.

Understanding of the biological factors reflecting stress is often reviewed to compile a complete evaluation delving into correlates that occur concurrent of a dose-response relationship (Calabrese et al., 2007). Seo et al. (2014) examined neural response to acute stressors and investigated core stimulation relayed in stress activation displaying increased activity in hippocampal area and decreased activity within the prefrontal cortex. Cortisol plays a vital role within the biological system of stress due to the relationship with the hypothalamic pituitary

adrenal axis (HPA) (Jackson, Knight, & Rafferty, 2010). The HPA axis works in conjunction with the autonomic nervous system (ANS) to respond to stressors exhibited (Ulrich-Lai, & Herman, 2009) however the HPA axis is slower to respond (Dickerson, & Kemeny, 2004) and cortisol over-load leads to undesired psychological inferences such as depression and anxiety (Lucas-Thompson, McKernan, & Henry, 2018).

Despite the biological response to stressors and heightened arousal, theories of psychological response to stress help complete an understanding of the mechanisms at play habitually. The Lazarus Theory (Lazarus & Folkman, 1986) examines appraisals of stress and relationships with the individual and their environment. Krohne (2002) specifies that two processes of importance are cognitive appraisal and coping skills. Appraisal is a concept that was developed by Lazarus (1966) to define processes that allow for understanding of the transactions between the emotional disposition including goals, values and expectancies and the external stimulus exhibited. Coping is thus defined as the emotional and psychological response to stress-individual interactions including that of tolerating and managing one's own internal arousal (Lazarus & Folkman, 1968). The overall coping of the individual affects the cognitive appraisal of stressors experienced in future occurrences dealing with instances causing heightened stress arousal (Ritter, Reifers, Klein, & Schoelles, 2007).

Recently literature has examined these theories regarding different approaches especially that reflecting biological and physiological activations described within the embodied approach examined by Francis (2018). Overall psychological perceptions of stress are hard to come by yet through examination of the Lazarus Theory of cognitive appraisals, Francis (2018) was able to conceptualise stress and develop a biopsychological model to allow for development of stress examination within a biological matter. This theory explains the emotional content experienced

when stress is at play yet also allows for underlying mechanisms from natural reflexes to also be accounted for.

Overtime, levels of stress can become a burden dependant on frequency of exposure and duration. This becomes a burden on the biological aspects from the allostasis load (McEwen, 2007). Dysregulation of the HPA axis leads to allostasis overload in turn activating a negative feedback response within the hippocampus and amygdala (Sinha, 2008). On a neurobiological level, heightened stress levels can result in incessant homeostatic dysregulation (Levine, 2005). Dopamine and opioids elicit similar regulatory pathways to cortisol exhibits in stress maintenance (Sinha, & Jastreboff, 2013). Reduction of the affects concurrent from the HPA axis results from oxytocinergic system reducing corticoid production (Hostinar, Sullivan, & Gunnar, 2014). Dopamine and opioids have a direct impact on the oxytocinergic system (Baskerville, & Douglas, 2010) inducing the desire for behaviours that induce such neurotransmitter (Stults-Kolehmainen, & Sinha, 2014).

Coping with excess stress is difficult and prevalence negative coping styles are obviously examined and show evidence that stress evokes making use of negative health behaviours to alleviate pressure (Naquin & Gilbert, 1996). Maladaptive behaviours have been examined in conjunction to the neurobiological reward system as a means of mimicking the stress release corticoid response (Maniam, & Morris, 2012) which is induced through the amygdala. Stress regulation encouraged from such response develops in the hippocampus and medial prefrontal cortex (McEwen, 2007). Further research suggests that such maladaptive behaviours trigger a neurological response encouraging reward mechanisms as a response to stress (Koob, & Le Moal, 2001). Buffering of stress occurs due to activation of neural circuits that occur frequently

from reward inducing behaviours (Ulrich-Lai et al., 2010) increasing likelihood of developing

maladaptive habits (Philips, Chamberland, Heckler, Abrams, & Eisenberg, 2016).

Certain behaviours are attentive at satisfying reward circuitry linking to satisfaction from

obtaining pleasure through consumption (Pool, Brosch, Delplanque, & Sander 2015). Selective

wanting increases drive for pursuit of stress reduction mediators (Herman et al., 2003).

Specifically, literature suggests that stress increases the likelihood of cigarette smoking and

alcohol consumption (Steptoe, Wardle, Pollard, Canaan, & Davies, 1996) alongside higher

calorific ingestion (O'Connor & Conner, 2011). These behaviours exhibit patterns neurologically

that influence mechanism activation like natural stress response (Wiggert, Wilhelm, Nakajima, &

al'Absi, 2016). Despite this not all reward behaviours are maladaptive, there is support that

exercise has significant stress-buffering stimulation (Olafsdottir, Cloke, & Vögele, 2017).

Growth of examination of stress regarding regular smoking is evident in the recent

reviews. Stressors influence both emotional and behavioural aspects leading to stimulation

seeking intentions to reduce sensation which often is expressed through smoking (Kosten &

Ambrosio, 2002). Links between nicotine and biological response mechanisms are apparent

leading to allostatic adaptations resulting in significant constituents of smoking affecting stress

response (Wiggert et al., 2016). Smoking has a high association with the release of stress drawn

from nicotine craving from instances of arousal (Todd, 2004). The need for an instant

physiological release with impulsive bursts reflects in smoking habits regarding stress due to the

instant effect stress has and nicotine craving heightening the impact stressors emit (Schepis,

Tapscott & Krishnan-Sarin, 2016). Stress exposure has an interaction with smoking on a level

that reward gained from the nicotine bust influences perception of stress relief (Buchmann et al.,

2010). Examination of perceived stress levels in association with smoking habits demonstrates a

significant positive relationship with higher stress levels and nicotine withdrawal symptomology (Lawless, Harrison, Grandits, Eberly, & Allen, 2015).

Similarly, alcohol has a relationship and association with stress reduction with consumption at a moderate rate (Schrieks, Joosten, Klöpping-Ketelaars, Witkamp, & Hendriks, 2016). Research suggests that modest alcohol consumption occurrent routinely has links to reduced cardiovascular responses when acute stressors are experienced (Jones et al., 2013). Self-report analyses of alcohol consumption showed a high correlation with heavy drinkers reporting higher levels of perceived stress (McCaul, Hutton, Stephens, Xu, & Wand, 2017). There are indicators that alcohol is perceived to be a stress reducer and means of modulating negative experiences giving way to justification of excess alcohol consumption (Cooper, Frone, Russell, & Modar, 1995). Other theories suggest that there are underlying factors directly impacting biological mediators of stress when examining the link with alcohol (Curtin & Lang, 2007) with recent studies indicating that stress-response dampening (SRD) has been seen to decrease negative responses to stressors (Armeli et al., 2003; Hefner, Moberg, Hachiya, & Curtin, 2013). Females tend to engage with alcohol consumption more than males as according to the findings of Wemm and colleagues (2013w).

Eating habits are directly affected by stress by encouraging high calorific food consumption when experiencing emotional stressors (Beukes, Walker, & Esterhuyse, 2010). There are significant indicators that stress has control in changing certain eating behaviours and choice of food (Tryon, DeCant, & Laugero, 2013). Concerns of stress are often expressed alongside problems of obesity which when under investigation show a significant correlation delving into psychological and biological factors occurrent from stress leading to the engagement of higher eating habits similar to the patterns observed from reward inducing behaviours (Adam

& Epel, 2007). Indulgent eating has been examined concerning the relationship with perceived stress concluding that there is a direct link between the two (Beukes et al., 2010) reflecting a manner of coping and elevating experienced stress. Emotional eating is often engaged with in instances of stress, especially within females, due to adverse stress exposure (Diggins, Woods-Giscombe, & Waters, 2015) resulting in stress having a direct effect on eating behaviours.

Overall, negative health behaviours such as smoking, alcohol consumption and eating habits have a direct impact on stress yet consideration of positive health behaviours such as exercise are equally interpretable regarding stress response. Exercise is highly associated with emotional wellbeing (Bernstein & McNally, 2018) with links to regulation of stress response apparent from even a singular session (Bernstein & McNally, 2018). Exercise is widely examined as an alleviator of physiological stress (Klaperski, von Dawans, Heinrichs & Fuchs, 2013) yet growth surrounding literature on psychological stress coping suggests that developing training that can affectively target cardiovascular health can help with stress related psychological disorders (Hsu et al., 2016). Stress resilience is visibly higher I those who actively engage in cardiovascular exercise due to self-reported resilience levels and how the individual views their own coping levels (Hegberg & Tone, 2015).

Health behaviours have a significant impact on the experience of stress, yet some populations are more vulnerable of the engagement in negative health behaviours than others. Students in third level education have susceptibility of frequently partaking in behaviours such as smoking, alcohol consumption and binge eating in times of higher stress (Magid et al., 2009). Stress is commonly used as a term describing pressures expressed often by students under academic pressure, yet other factors co-exist and have direct negative impacts on psychological and physiological health (MacGeorge, Samter, & Gillihan, 2005).

Third level students often experience various factors that heighten their experience of stress especially through the transitional period and settling which occurs within the first couple of months of the initial semester (Riordan & Carey, 2018). Many students move from home to on campus living although, plenty students commute to college daily (James, 1982) showing significant risk factors to stress in both groups. Students are inflicted with the responsibility of seeking employment to help provide funding for expenses ranging from commute costs through to affording necessity items alongside keeping up with peer social events (Vaughn, Drake, & Haydock, 2016). Employment can lead to struggles of keeping up with academic performance as explored by Logan, Hughes and Logan (2016) occurrent from less hours studying and completing assignments.

Students undergo many daily stressors and constant adjustments which reflects in the engagement of health behaviours engaged in during the period spent at college and has possibility of continuing into later adulthood (Riordan & Carey, 2018). Prominently there is evidence suggesting the use of alcohol, cigarette smoking and binge eating as habits of dealing with stressors within college populations (Boujut, 2013). Need for a quick fix stress relief is desired easily achieved through such negative health behaviours (Pritchard, Wilson, & Yamnitz, 2007) due to lack of time that is accessible by students affected. Many college students do not understand efficient coping strategies when faced with high levels of stress therefore resorting to taking up smoking, alcohol abuse and binge eating is prevalent (Bennion, Olpin, & DeBeliso, 2018). Overall, the college experience is a majorly social period and many events revolve around drinking alcohol leading to more exposure and engagement of such behaviours (Butler, Dodge, & Faurote., 2010).

Students are highly affected by stress and higher levels of stress from desire to complete a degree can lead to extra pressures to progress academically (Garriott & Nisle, 2017). Negative health behaviours are used as coping mechanisms due to the quick and easy nature of release (Bland, Melton, Bigham & Welle, 2014) yet positive mechanisms are available such as exercise however more effort and time is required to achieve feasible release (Bland et al., 2014). Overall, from review of the literature there is a clear understanding of the biological involvement of stress and behaviours engaged in to mitigate the experience of stress especially regarding alcohol consumption, smoking behaviours, eating habits and exercise (Jennings, Henderson, Erla, Abraham, & Gillum, 2018).

Rationale and Research Aims/Hypotheses

Despite evidence considered, there is a gap in the literature regarding the psychological relationship between perceived stress and negative health behaviours amongst third level students within an Irish context. High understanding has been examined on the biological response within the HPA axis response with direct research carried out on engagement of alcohol consumption, smoking cigarettes, fluctuating eating habits and exercise although further examination is required on coping strategies developed due to the perception of the stress experienced.

Prior literature presents evidence suggesting that stress levels can impact the engagement of both negative and positive health behaviours. Gender, employment status and age may all be related to behaviours of negative health affect. It is important to examine such constructs within an Irish third level student population to help further research within the area. Stress and the relationship with negative health behaviours is the main objective of this study. With consideration of prior research, this study included three main aims:

1) To investigate the relationship between perceived stress levels and engagement of health behaviours including binge eating, alcohol consumption, cigarette smoking and exercise.

2) To understand if engagement in negative health behaviour can be predicted by stress, employment status, gender and age.

3) To determine whether there are gender differences between perceived stress levels

From examination of previous literature, it is hypothesized that: (1) third-level students who have higher levels of stress will engage in higher levels of negative health behaviours; (2) students with part-time employment will engage with negative health behaviours more than those who are unemployed; (3) stress will predict the engagement of smoking, alcohol consumption and binge eating; (4) females will have higher levels of stress and will engage with alcohol consumption as a coping behaviour more than males.

Methods

Participants

The total number of participants received for this study was 84. The sample comprised of male (27.4%, $n = 23$) and female (72.6%, $n = 61$) students studying within the republic of Ireland. All participants were between the age of 18 and 32 years of age (M = 20.4, SD = 2.019). All participants study currently in third level education. There was a higher participant rate from students within the National College of Ireland. 7 (8.3%) participants had sufficient full-time employment, whilst 52 (61.9%) participants were employed part-time and 25 (29.8) were unemployed. Further distributions of demographic variables are contained below in Table 1.

Table 1. Frequencies for the current sample displaying each demographic variable (N = 84)

Variable	Frequency	Valid Percentage
Gender		
Male	23	27.4
Female	61	72.6
Employment Status		
Full-time	7	8.3
Part-time	52	61.9
Unemployed	25	29.8
College Institution		
National College of Ireland	45	53.6
Trinity College	7	8.3
Dublin Institute of Technology	5	6.0
Dublin City University	3	3.6

Maynooth	4	4.8
University College of Dublin	3	3.6
Other	17	20.2
Age (in years)		
18-20	48	57.2
21-23	31	36.9
24-26	4	4.8
27+	1	1.2

Participants were attained through convenience sampling combined with snowball sampling. The study was posted on social media platforms such as Facebook and Instagram to encourage the desired population of young adults who are currently in third level education. Through these mediums, sharing of the study within peer groups was highly encouraged. This study is cross-sectional completed through online survey software. No incentives were used to encourage participation. All participants were over the ages of 18 and informed consent was achieved before the individual began participation. Ethical approval was received from the Ethical Review Board of the National College of Ireland.

Materials

This study utilized three surveys developed to serve the purpose of examining the concepts of interest. The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1994) was used to examine stress. The European Health Behaviour Survey (Wardle & Steptoe, 1991) along with the Adolescent Illicit Drug Use, Cigarette Smoking and Alcohol Drinking Behaviour

Questionnaire (Madu & Malta, 2003) were used in conjunction to comprehensively examine

health behaviours engagement. Variables within each individual questionnaire or scale were

excluded due to their unethical products of examination or nonrelevance to this study.

Demographics including gender, age and institution of college attending were collected

prior to exposure of the questionnaires. This is to ensure that all participants involved are that of

the target population. Employment status featured within the demographics section as within

analysis, it is important to explore different factors that can impact on the levels of engagement

in negative health behaviours.

The Perceived Stress Scale

The Perceived Stress Scale is composed of a set of 10 questions and is proven to have

high rates of validity and is frequently used when assessing rates of stress levels on a self-rate

scale. Scoring within the scale contains four reversibly scored items (4, 5, 7 & 8). Summing of

all responses is then permissible. Higher scores indicate higher levels of perceived stress. The

reliability score achieved from Cronbach Alpha was .862. This scale is commonly used and is

known highly for suitably assessing stress without violating assumptions of reliability. Schlotz

and colleagues (2011) utilised this scale on a student population and achieved an internal

reliability of .86 leading to appropriate level of reliability within a sample similar to that of the

current study.

The European Health Behaviour Survey

The European Health Behaviour Survey (Wardle & Steptoe, 1991) featured a series of

questions of which assess different health related behaviours. Within the series of questions,

exclusion of *driving behaviours, preventive health care*, *beliefs about the importance of*

behaviours for health and *knowledge of factors related to illness* variables were implemented

due to their irrelevant constructs to this study. Featured was a set of 5 questions understanding

positive health behaviours alongside 10 items seeking to understand the individuals eating habits.

Within this scale are 3 items related to smoking and 4 related to alcohol consumption. These two

variables will be considered separately. Due to variables being excluded within the scale, it will

not be totalled up. Each score will indicate the induvial engagement of said health behaviours

and necessary recoding was applied to ensure that the higher the score received leads to higher

engagement in the negative aspects of the health behaviour.

The Adolescent Illicit Drug Use, Cigarette Smoking and Alcohol Drinking Behaviour Questionnaire

The last questionnaire used within this study was the Adolescent Illicit Drug Use,

Cigarette Smoking and Alcohol Drinking Behaviours Questionnaire. This questionnaire includes

questions investigating the influence negative health behaviours has on an adolescent population.

For ethical reasons and irrelevance to this study, questions relating to drug usage will be

excluded. In combination with the European health behaviours scale, alcohol usage along with

cigarette smoking is assessed. A Cronbach's Alpha test was done on the combination of the two

questionnaires receiving a high reliability score of .711. Recoding of items *Have you ever*

smoked a cigarette?, *Have you ever consumed alcohol?* and *Were you ever drunk or irritable*

after drinking alcohol? to ensure the variables match the same coding as the European Health

Behaviour Survey. The higher the score, the more the individual engages with negative health

behaviours.

The three questionnaires will be input into the Google Docs survey engine and once

completion of data collection is reached, the data will be transferred into a Microsoft Excel

spreadsheet and edited so a smooth transfer of the data set to the Statistical Package for Social

Science (SPSS) software to allow for appropriate statistical analysis.

Design

This study is a quantitative assessment of the relationship between stress levels and

engagement of negative health behaviours such as alcohol consumption, cigarette smoking and

binge eating. Alongside this, the assessment of the relationship between positive health

behaviours and stress levels is also applicable. The independent variable (IV) is stress levels

whilst the dependant variables (DV) are both negative and positive health behaviours. Similarly,

the criterion variable (CV) being assessed is negative health behaviours with predictor variables

(PV) of stress, employment and gender.

Statistical analysis will include descriptive statistics of demographics along with stress

scores and scores relating to negative and positive health behaviour engagement. Inferential

statistics will be performed subsequently. A Pearson correlational analysis will be performed to

investigate the relationship between alcohol consumption, binge eating and exercise (IV) with

stress levels (DV). An independent samples T-test will be performed on gender (IV) and stress

totals (DV) investigating correlations. A multiple regression model will be applied with stress,

age. employment and gender (PVs) predicting influence on engagement of negative health

behaviours (CV). An ANOVA will be carried out to assess the levels of smoking (IV) against

levels of perceived stress (DV).

Procedure

The questionnaires including the Perceived Stress Scale, European Health Behaviour

Scale and Adolescent Illicit Drug Use, Cigarette Smoking and Alcohol Drinking Behaviour

Questionnaire with criteria previously explained along with a singular question relating to binge

eating habits were utilised within this study. All questions were input into a Google Docs survey engine. Psychological wellbeing was emphasised throughout the duration of the study therefor within the Google Docs engine, a paragraph explaining the nature of this survey along with the risk factors and explanation of the anonymity of the individual's data was input at the start, so each participant was made aware about the study's components. The participant was also made aware of their right to withdraw whilst taking part in this study yet due to anonymization of all data, they cannot withdraw their data after completion of the study. To ensure all participants agree with the briefing paragraph, a check box was included stating the individual has read the information and is above the age of 18.

The study thus commences once the individual agrees to the conditions. Each of the scales and questionnaires were presented individually and in order of the Perceived Stress Scale; Adolescent Illicit Drug Use, Cigarette Smoking and Alcohol Behaviour Questionnaire; and then the European Health Behaviour Survey with addition of a singular question enquiring about binge eating frequencies. Not all questions were compulsory therefore if a participant felt uncomfortable about answering they were not forced to answer to complete the survey. The survey took approximately took between 6-8 minutes to fully complete.

Once completion of the survey was achieved, the participant was exposed to a conclusion paragraph reminding them of their participation nature and completely debriefing the individual. A reminder of the anonymity of the study was also given. Helplines and websites were also included in the debriefing element for those who felt any distress. This is the ensure optimal physiological wellbeing throughout participation. All dissemination information is also provided for those who show interest and the study including an email to access results after completion of

the study. All scales, briefing information and debriefing information will be provided within the appendix.

Ethical considerations were highly considered whilst reviewing the study before sharing on social media platforms. Participants must be above the age 18 to participate. Overall, the topics covered within the study are not of serious physiological harm yet exclusion of certain criteria within scales was important due to their unethical constructs such as drug usage. Overall this study exhibits little to no ethical harm.

Results

Descriptive Statistics

Descriptive statistics were performed on the data including Means (M), Standard

Deviations (SD), Medians (MD), Standard Errors and Range along with tests of normality.

Preliminary tests were performed on the data set and indicate that all continuous variables follow

the tests of normality. The results of the continuous variables are displayed below in Table 2.

Within the data set 62 (73.8%) were non-smokers, 13 (15.5%) were smokers and 9 (10.7%) were

ex-smokers (SD=.67).

Table 2. Descriptive statistics of all continuous variables

	Mean (95% Confidence Intervals)	Std. Error Mean	Median	SD	Range
Perceived Stress	23.86 (22.21-25.40)	.78	24	7.08	6-40
Alcohol Consumption	12.40 (11.24-13.56)	.58	12	4.69	3-29
Diet Total	14.90 (14.10-15.70)	.40	15	3.67	7-27

Inferential Statistics

Independent Samples T-test:

An independent samples t-test was conducted to compare levels of stress between males

and females. There was a significant difference in scores (t (31.41) = 2.54, p = .016) with

females (M = 25.20, SD = 6.09) scoring higher than males (M = 20.35, SD = 8.35). The

magnitude of the differences in the means (mean difference = 4.9, 95% CI: 8.75 - .96) was

moderate (Cohen's d = .66).

A separate independent samples t-test was conducted to compare levels of smoking between males and females. There was no significant difference in scores (t (82) = 1.08, p = .29) with females (M = .51, SD = 1.45) scoring slightly higher than males (M = .17, SD = .58). The magnitude of the differences in the means (mean difference = .34, 95% CI: .95 - .29) was small (Cohen's d = .31).

Pearson Correlation:

The relationship between levels of perceived stress, binge eating, alcohol consumption and exercise was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a moderate, positive correlation between the two variables of perceived stress and binge eating (r = .29 [95% CI = .06 - .52], n = 82, p < .008). This indicates that the two variables share approximately 8.5% of variance in common. Results indicate that higher levels of stress are associated with higher levels of engagement in binge eating. There were no significant relationships between the other variables. Results are displayed below in Table 3.

Table 3. Correlations between all continuous variables.

Variables	1	2	3	4
1. Stress	1			
2. Alcohol Consumption	.039	1		
3. Exercise	.018	.037	1	
4. Binge Eating	.291**	.164	.116	1

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

One-Way Between Groups ANOVA:

A one-way between groups ANOVA was conducted to determine if there were differences in levels of perceived stress among three tiers of smoking habits. Participants were divided into three groups; smoker, non-smoker and ex-smoker.

There was no statistically significant difference in levels of perceived stress scores within the three groups $F (2, 80) = .36$, $p = .7$. The effect size indicated a very small difference in stress scores (eta squared $= .008$).

Post-hoc comparisons using the Tukey HSD test indicated that the mean score for smokers ($M = 25.23$, $SD = 6.66$) was not significantly higher ($p = .70$) than non-smokers ($M = 23.48$, $SD = 7.33$) or ex-smokers ($p = .96$; $M = 24.44$, $SD = 6.37$). There was no statistically significant difference in mean scores between non-smokers and ex-smokers ($p = .94$).

Multiple Regression:

Multiple regression analysis was performed to determine how well alcohol consumption could be explained by three variables including age, gender, employment status and levels of perceived 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 4 for full details). Five of the seven predictor variables were significantly correlated with the criterion variable, and these significant effects ranged from $r = .11$ (perceived stress) to $r = .30$ (employment status). 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.

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 four predictor variables

explained 17.9% of variance in negative health behaviours ($F_{(4, 41)} = 2.02$, $p = .112$). No

variables were found to predict levels of negative health behaviours significantly. Employment

was found to have the most significant result ($\beta = -.351$, $p = .026$). The other variables presented

results of: stress ($\beta = .192$, $p = .214$), gender ($\beta = -.014$, $p = .933$), and age ($\beta = -.264$, $p = .098$)

(see Table 5 for full details).

Table 4**.** Correlations for regression model

Variables	1	2	3	4	5
1. Negative Health Behaviours	1				
2. Stress	.11	1			
3. Employment	-.30	.12	1		
4. Gender	.10	.31	-.003	1	
5. Age	-.20	.12	-.12	-.18	1

Note. Statistical significance: *$p < .05$; **$p < .01$; ***$p < .001$

Table 5. Multiple regression model predicting engagement with negative health behaviours

	R^2	β	B	SE	CI 95% (B)
Model	.17				
Stress		.19	.20	.16	.14 / .53
Employment		-.35	-4.33	1.87	8.12 / .535
Gender		-.01	-.23	2.59	5.46 / 5.02
Age		-.26	-.94	.55	2.06 / .18

Note. R^2 = R-squared; Ajd R^2 = Adjusted R-squared; β = standardized beta value; B = unstandardized beta value; SE = Standard errors of B; CI 95% (B) = 95% confidence interval for B; N = 398; Statistical significance: *p < .05; **p < .01; ***p < .001

Discussion

Overall, results achieved from this study came out insignificant. The main hypothesis of the study was that those who have higher levels of perceived stress will engage more with negative health behaviours such as binge eating, cigarette smoking and alcohol consumption. A Pearson correlation was conducted to assess the relationship between perceived stress, binge eating, alcohol consumption and exercise. Alcohol consumption (p = .982) and exercise (p = .875) had no significant relationship with stress levels. Binge eating (p = .008) had a positive correlation with stress levels meaning that higher stress levels lead to higher frequency of binge eating.

The relationship of stress levels with smoking habits was assessed through an ANOVA. There were three groupings of which the participants were separated into (smoker, non-smoker and ex-smoker). Between the three groups there were no statistically significant difference between the groups and perceived stress levels although the mean value for smokers (M = 25.23) was slightly higher than non-smokers (M = 23.48) and ex-smokers (M = 24.44) meaning that there could be a possible effect at play but not visible within the data collected for this study.

A multiple regression was conducted to investigate gender differences, employment status, age and stress levels as predictors for engagement of negative health behaviours yet no significant results were evident. No individual variable shared enough variance to allow for prediction of the engagement in negative health behaviours among the data set. Despite this, employment status (p = .026) had a very small predictive element in comparison to the other variables within the model showing that employment could possibly predict engagement in negative health behaviours if examined within further studies.

Stress levels were assessed looking at gender differences through an independent samples t-test. This found that females (M = 25.20) have significantly higher levels of perceived stress in comparison to males (M = 20.35). This evidently concurs with the hypothesis predicted within the literature review. Although due the higher number of female participants within this current study, there could be a possible bias at play.

The main aim of this study was to investigate the relationship between health behaviours and levels of stress within an Irish student population. The hypotheses presented did not correspond with results found within this data set. The population did not engage higher with health behaviours such as alcohol consumption, cigarette smoking and exercise when stress is experienced although the results show that there was a relationship between binge eating and stress levels.

The results found from this study have support from other studies showing that similar results are expected to occur from different populations. Despite having no statistical significance in most results, this is reflected in other studies that have been conducted surrounding similar concepts and hypotheses.

Rosenbaum and White (2015) examined binge eating as a coping behaviour for stress and anxiety. Their results concluded stress was a high risk-factor for developing a clinical diagnosis of binge eating disorder leading to obesity. Although the current study did not investigate the clinical version of binge eating, the prevalence of stress and its relationship with such behaviour parallels the findings of the study examining similar concepts. Along with this, gender differences with engagement of such eating behaviours were evident in other studies, similar to that of the current study. Despite not having a major difference, females within this study had

higher levels of stress yet investigation of levels of binge eating between the genders was insignificant.

Individual differences are apparent within studies of this nature especially involving stress response and behaviours involved with coping. Differences gender specified differences are of interest especially regarding coping with stress arousal. Often occurrent that perceived stress is higher within females than males (Seo, Ahluwalia, Potenza, & Sinha, 2017). Gender differences are seen within all constructs and are important to acknowledge due to the biological differences between males and females (Bollinger, Burns, & Wellman, 2016) which leads to different methods of coping with states of arousal such as stress (Bonneville-Roussy, Evans, Verner-Filion, Vallerand, & Bouffard, 2017).

There is plenty of evidence within prior literature suggesting that students within undergraduate education have tendencies to engage with behaviours such as cigarette smoking and alcohol consumption to alleviate the stress experiences (Pelletier, Lytle, & Laska, 2016) yet the study at hand did not succumb such results therefor possibly suggesting within an Irish context, such may not be applicable. The results found in this study are not generalizable due to the small population size therefore there could still be an effect at play.

Females often have smoking habits that are more correlated with stress than males (Torres & O'dell, 2016) yet the current study did not see a gender difference overall. Investigation of the response to stress through the likes of cigarette smoking has been profoundly examined yet within an Irish population, not enough support is occurrent to support that the context allows for generalisable results. Due to a population that has low levels of smokers, the findings cannot be applied to other groups within similar circumstances.

Employment was seen to have a small relationship with engagement in negative health behaviours and this is supported by a study examining the effect job stress has on levels of cigarette smoking and alcohol consumption (Azagba & Sharaf, 2011). This study concluded that higher levels of stress are positively correlated with the two health behaviours. The current study may not have achieved such substantial results yet there is a small indication that further research with larger samples could achieve similar outcomes.

Reflecting on the Lazarus Theory (Lazarus & Folkman, 1968), coping is dependent on the individual especially regarding stress and their own experience. Coping manifests in behaviours leading to maladaptive behaviour engagement yet exercise is also noted to be of significance (Holton, Barry, & Chaney, 2016) but findings from the current study suggest the relationship is not as strong as literature states. Overall, exercise is seen to be a healthy coping strategy with stress within the biological system (Gerber et al., 2015) but this study saw no significant relationship between lower stress levels in association with higher exercise sessions.

Limitations

Overall, the results found from this study were not of statistical significance. This can be due to many limitations occurrent from both methodology and participation within this study. Alongside the scales and questionnaires used in the survey, these elements lead to problematic flaws that could account for not achieving results desired and explored within the literature review.

Firstly, the participation levels were low for a survey examining the relationship between negative health behaviours and perceived stress levels among students (n = 84). This can lead to a lower effect size and possible insignificance in results due to both individual differences and different values of experience that can lead to conflict within the population.

There was a large difference of participation between genders. In total there was 61 females and 23 males who engaged with this study. With such a large gap between genders, this could indicate a bias within the results that state there is a significant difference between males and females and stress levels. Similarly, this difference could allow for other insignificant findings within the study as the distribution is highly female rather than having equality.

Smoking was one of the constructs assessed when investigating negative health behaviours. Most of the population were non-smokers (n = 62) with smokers (n = 13) and ex-smokers (n = 9) being a minority within the population. Having such a small group of smokers could indicate that there would be no significant result when examining smoking levels alongside perceived stress levels due to the small sample size within the whole population. A larger sample of smokers would be desired to fully examine the relationship between the two variables.

Despite the Perceived Stress Scale having high validity, the other two questionnaires did not achieve the same level of accuracy and validity to accurately assess constructs at hand. Due to no total values available to allow for totalling of values hence the total scores from both questionnaires would lack significant meaning. Within analysis the likes of alcohol were totalled up yet due to their non-significant totalling, the validity of the scores is doubtful.

The constructs of interest were not appropriately assessed such as exercise levels and alcohol consumption. Further exploration would be necessary with separate more standardised tests of such variables to get a complete assessment of the levels in which participants engage with such behaviours. Similarly, with smoking, this study only utilised where the individual was a smoker or not and for some testing frequency of smoking was also used yet it would be of

interest to find a scale in which levels of engagement are validly assessed to achieve greater depth into the scores alongside the overall perceived stress levels.

Overall the methodology of this study was not as valid and accurate as desired therefore further research is needed within the field examined to ensure that significance was not over looked due to the small sample size and undesirable construct examination occurrent within the current study.

Further Research

The area surrounding stress and its relationship with negative health behaviours is of interest to student populations to develop programmes and interventions to help deal with stress appropriately. Due to the insufficient results achieved from this study, further research is desired. Further development of the tests to assess constructs along with an equally distributed population including more participants to ensue optimal results are achieved.

Furthermore, there is an interesting relationship between negative coping behaviours with employment therefore development of a mediation study investigating the relationship between employment status regarding stress levels and in turn examining the overall engagement in negative health behaviours from higher stress levels. Within an Irish context, a study examining this could have interesting findings.

Such examination of the likes of alcohol consumption and cigarette smoking with its relationship to stress levels is important especially within an Irish context to help develop interventions for such behaviours. Although this study was done with a student population, an interesting population to investigate constructs like this would be that of middle-aged population working within a business setting such as accountancy. This would help develop further the knowledge linking stress to negative health behaviours within a different population.

Further exploration with positive coping behaviours such as exercise along with the examination of dietary habits would be optimal as binge eating correlated positively with stress, yet exercise had no significant relationship therefore if possible it would be desired to further the exploration of such concepts.

This study examines how stress can impact on the individuals coping behaviours and how the population interacts with perceived stress relating to alcohol consumption, cigarette smoking and binge eating along with exercise. Although the study did not conclude to sufficient evidence supporting the hypotheses stated, more research is required surrounding the area of negative health behaviours and their relationship with stress. Although previous studies have shown evidence supporting engagement in negative health behaviours when stress is higher among college populations, within this population the results did not concur.

Conclusion

This study was designed to investigate the relationship between stress and negative health behaviours such as alcohol consumption, cigarette smoking and binge eating along with positive health behaviour exercise. Very little significant results came from the study especially regarding negative health behaviours. Binge eating had a significant positively correlated result with stress, yet other behaviours did not. As a complex state of arousal, stress is particularly interesting to investigate therefore need for furthering examination of such topics is essential. Although the hypotheses did not hold up, this body of research can contribute to further investigation of the constructs assessed.

References

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology &*
Behavior,91(4), 449-458. doi:10.1016/j.physbeh.2007.04.011

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology &*
Behavior,91(4), 449-458. doi:10.1016/j.physbeh.2007.04.011

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology &*
Behavior,91(4), 449-458. doi:10.1016/j.physbeh.2007.04.011

Baskerville, T. A., & Douglas, A. J. (2010). Dopamine and Oxytocin Interactions Underlying
Behaviors: Potential Contributions to Behavioral Disorders. *CNS Neuroscience &*
Therapeutics,16(3). doi:10.1111/j.1755-5949.2010.00154.x

Bennion, E., Olpin, M. N., & Debeliso, M. (2018). A comparison of four stress reduction
modalities on measures of stress among university students. *International Journal of*
Workplace Health Management,11(1), 45-55. doi:10.1108/ijwhm-11-2017-0090

Bernstein, E. E., & Mcnally, R. J. (2018). Exercise as a buffer against difficulties with emotion
regulation: A pathway to emotional wellbeing. *Behaviour Research and Therapy,109*, 29-
36. doi:10.1016/j.brat.2018.07.010

Beukes, M., Walker, S., & Esterhuyse, K. (2009). The role of coping responses in the
relationship between perceived stress and disordered eating in a cross-cultural sample of
female university students. *Stress and Health,26*(4), 280-291. doi:10.1002/smi.1296

Bollinger, J. L., Burns, C. M., & Wellman, C. L. (2016). Differential effects of stress on
microglial cell activation in male and female medial prefrontal cortex. *Brain, Behavior,*
and Immunity,52, 88-97. doi:10.1016/j.bbi.2015.10.003

Bonneville-Roussy, A., Evans, P., Verner-Filion, J., Vallerand, R. J., & Bouffard, T. (2017).

    Motivation and coping with the stress of assessment: Gender differences in outcomes for

    university students. *Contemporary Educational Psychology,48*, 28-42.

    doi:10.1016/j.cedpsych.2016.08.003

Boujut, E. (2013). Development and validation of an exploratory measure to assess student

    coping: The student coping scale. *College student journal*, *47*(1), 12-23.

Buchmann, A., Laucht, M., Schmid, B., Wiedemann, K., Mann, K., & Zimmermann, U. (2008).

    Cigarette craving increases after a psychosocial stress test and is related to cortisol stress

    response but not to dependence scores in daily smokers. *Journal of*

    Psychopharmacology,24(2), 247-255. doi:10.1177/0269881108095716

Butler, A. B., Dodge, K. D., & Faurote, E. J. (2010). College student employment and drinking:

    A daily study of work stressors, alcohol expectancies, and alcohol consumption. *Journal*

    of Occupational Health Psychology,15(3), 291-303. doi:10.1037/a0019822

Calabrese, E. J., Bachmann, K. A., Bailer, A. J., Bolger, P. M., Borak, J., Cai, L., ... & Cook, R.

    R. (2007). Biological stress response terminology: integrating the concepts of adaptive

    response and preconditioning stress within a hormetic dose–response

    framework. *Toxicology and applied pharmacology*, *222*(1), 122-128.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). Perceived Stress Scale. *PsycTESTS Dataset*.

    doi:10.1037/t02889-000

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and

    negative emotions: A motivational model of alcohol use. *Journal of Personality and*

    Social Psychology,69(5), 990-1005. doi:10.1037//0022-3514.69.5.990

Curtin, J. J., & Lang, A. R. (2007). Alcohol and Emotion: Insights and Directives From

      Affective Science. *Emotion and Psychopathology: Bridging Affective and Clinical*

      *Science.,*191-213. doi:10.1037/11562-009

Diggins, A., Woods-Giscombe, C., & Waters, S. (2015). The association of perceived stress,

      contextualized stress, and emotional eating with body mass index in college-aged Black

      women. *Eating Behaviors,19*, 188-192. doi:10.1016/j.eatbeh.2015.09.006

Erbas, Y., Ceulemans, E., Kalokerinos, E. K., Houben, M., Koval, P., Pe, M. L., & Kuppens, P.

      (2018). Why I don't always know what I'm feeling: The role of stress in within-person

      fluctuations in emotion differentiation. *Journal of personality and social*

      psychology, *115*(2), 179.

Francis, A. L. (2018). The Embodied Theory of Stress: A Constructionist Perspective on the

      Experience of Stress. *Review of General Psychology,22*(4), 398-405.

      doi:10.1037/gpr0000164

Hobfoll, S. E., & Freedy, J. (2017). Conservation of Resources: A General Stress Theory

      Applied To Burnout. *Professional Burnout,*115-129. doi:10.4324/9781315227979-9

Garriott, P. O., & Nisle, S. (2018). Stress, coping, and perceived academic goal progress in first-

      generation college students: The role of institutional supports. *Journal of Diversity in*

      Higher Education,11(4), 436-450. doi:10.1037/dhe0000068

Gerber, M., Lindwall, M., Brand, S., Lang, C., Elliot, C., & Pühse, U. (2014). Longitudinal

      relationships between perceived stress, exercise self-regulation and exercise involvement

      among physically active adolescents. *Journal of Sports Sciences,33*(4), 369-380.

      doi:10.1080/02640414.2014.946072

Hefner, K. R., Moberg, C. A., Hachiya, L. Y., & Curtin, J. J. (2013). Alcohol stress response

      dampening during imminent versus distal, uncertain threat. *Journal of Abnormal*

      Psychology,122(3), 756-769. doi:10.1037/a0033407

Hegberg, N. J., & Tone, E. B. (2015). Physical activity and stress resilience: Considering those

      at-risk for developing mental health problems. *Mental Health and Physical Activity,8*, 1-

      7. doi:10.1016/j.mhpa.2014.10.001

Herman, J. P., Figueiredo, H., Mueller, N. K., Ulrich-Lai, Y., Ostrander, M. M., Choi, D. C., &

      Cullinan, W. E. (2003). Central mechanisms of stress integration: Hierarchical circuitry

      controlling hypothalamo–pituitary–adrenocortical responsiveness. *Frontiers in*

      Neuroendocrinology,24(3), 151-180. doi:10.1016/j.yfrne.2003.07.001

Holton, M. K., Barry, A. E., & Chaney, J. D. (2016). Employee stress management: An

      examination of adaptive and maladaptive coping strategies on employee

      health. *Work,53*(2), 299-305. doi:10.3233/wor-152145

Hostinar, C. E., Sullivan, R. M., & Gunnar, M. R. (2014). Psychobiological mechanisms

      underlying the social buffering of the hypothalamic–pituitary–adrenocortical axis: A

      review of animal models and human studies across development. *Psychological*

      Bulletin,140(1), 256-282. doi:10.1037/a0032671

Hsu, Y., Tsai, S., Yu, L., Chuang, J., Wu, F., Jen, C. J., & Kuo, Y. (2015). Long-term moderate

      exercise accelerates the recovery of stress-evoked cardiovascular responses. *Stress,19*(1),

      125-132. doi:10.3109/10253890.2015.1108305

Jackson, J. S., Knight, K. M., & Rafferty, J. A. (2010). Race and Unhealthy Behaviors: Chronic

      Stress, the HPA Axis, and Physical and Mental Health Disparities Over the Life

Course. *American Journal of Public Health,100*(5), 933-939.

doi:10.2105/ajph.2008.143446

James, A. (1982). A multivariate comparative analysis of work-related symptoms of distance and

campus undergraduates. *Research in Higher Education,16*(4), 303-322.

doi:10.1007/bf00973617

Jennings, R. A., Henderson, C. S., Erla, M. A., Abraham, S., & Gillum, D. (2018). Stress Coping

Behaviors of Faith–Based College Non-Student Athletes vs. Student-Athletes. *College

Student Journal*, *52*(2), 245-257.

Jones, A., Mcmillan, M. R., Jones, R. W., Kowalik, G. T., Steeden, J. A., Pruessner, J. C., . . .

Muthurangu, V. (2013). Habitual alcohol consumption is associated with lower

cardiovascular stress responses – a novel explanation for the known cardiovascular

benefits of alcohol? *Stress,16*(4), 369-376. doi:10.3109/10253890.2013.777833

Klaperski, S., Dawans, B. V., Heinrichs, M., & Fuchs, R. (2013). Does the level of physical

exercise affect physiological and psychological responses to psychosocial stress in

women? *Psychology of Sport and Exercise,14*(2), 266-274.

doi:10.1016/j.psychsport.2012.11.003

Koob, G. (2001). Drug Addiction, Dysregulation of Reward, and

Allostasis. *Neuropsychopharmacology,24*(2), 97-129. doi:10.1016/s0893-

133x(00)00195-0

Kosten, T. A., & Ambrosio, E. (2002). HPA axis function and drug addictive behaviors: Insights

from studies with Lewis and Fischer 344 inbred rats. *Psychoneuroendocrinology,27*(1-2),

35-69. doi:10.1016/s0306-4530(01)00035-x

Krohne, H. W. (2002). Stress and coping theories. *International Encyclopedia of the Social Behavioral Sceinces*, *22*, 15163-15170.

Lawless, M. H., Harrison, K. A., Grandits, G. A., Eberly, L. E., & Allen, S. S. (2015). Perceived stress and smoking-related behaviors and symptomatology in male and female smokers. *Addictive Behaviors,51*, 80-83. doi:10.1016/j.addbeh.2015.07.011

Lambert, W. W., & Lazarus, R. S. (1970). Psychological Stress and the Coping Process. *The American Journal of Psychology,83*(4), 634. doi:10.2307/1420698

Lazarus, R. S., & Folkman, S. (1986). Cognitive Theories of Stress and the Issue of Circularity. *Dynamics of Stress,*63-80. doi:10.1007/978-1-4684-5122-1_4

Levine, S. (2005). Developmental determinants of sensitivity and resistance to stress. *Psychoneuroendocrinology,30*(10), 939-946. doi:10.1016/j.psyneuen.2005.03.013

Logan, J., Hughes, T., & Logan, B. (2016). Overworked? An observation of the relationship between student employment and academic performance. *Journal of College Student Retention: Research, Theory & Practice*, *18*(3), 250-262.

Lucas-Thompson, R. G., McKernan, C. J., & Henry, K. L. (2018). Unraveling current and future adolescent depressive symptoms: The role of stress reactivity across physiological systems. *Developmental psychology*, *54*(9), 1650.

Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature reviews neuroscience*, *10*(6), 434.

Lykkegaard, J., Rosendal, M., Brask, K., Brandt, L., & Prior, A. (2018). Prevalence of persons contacting general practice for psychological stress in Denmark. *Scandinavian Journal of Primary Health Care,36*(3), 272-280. doi:10.1080/02813432.2018.1499494

MacGeorge, E. L., Samter, W., & Gillihan, S. J. (2005). Academic stress, supportive

communication, and health. *Communication Education*, *54*(4), 365-372.

Madu, S. N., & Matla, M.-Q. P. (2003). Adolescent Illicit Drug Use, Cigarette Smoking and

Alcohol Drinking Behaviour Questionnaire [Database record]. Retrieved from

PsycTESTS. doi: http://dx.doi.org/10.1037/t25774-000

Magid, V., Colder, C. R., Stroud, L. R., Nichter, M., & Nichter, M. (2009). Negative affect,

stress, and smoking in college students: Unique associations independent of alcohol and

marijuana use. *Addictive Behaviors,34*(11), 973-975. doi:10.1016/j.addbeh.2009.05.007

Maniam, J., & Morris, M. J. (2012). The link between stress and feeding

behaviour. *Neuropharmacology,63*(1), 97-110. doi:10.1016/j.neuropharm.2012.04.017

Mccaul, M. E., Hutton, H. E., Stephens, M. A., Xu, X., & Wand, G. S. (2017). Anxiety, Anxiety

Sensitivity, and Perceived Stress as Predictors of Recent Drinking, Alcohol Craving, and

Social Stress Response in Heavy Drinkers. *Alcoholism: Clinical and Experimental

Research,41*(4), 836-845. doi:10.1111/acer.13350

Mcewen, B. S. (2007). Physiology and Neurobiology of Stress and Adaptation: Central Role of

the Brain. *Physiological Reviews,87*(3), 873-904. doi:10.1152/physrev.00041.2006

Monroe, S. M. (2008). Modern Approaches to Conceptualizing and Measuring Human Life

Stress. *Annual Review of Clinical Psychology,4*(1), 33-52.

doi:10.1146/annurev.clinpsy.4.022007.141207

Naquin, M. R., & Gilbert, G. G. (1996). College Students Smoking Behavior, Perceived Stress,

and Coping Styles. *Journal of Drug Education,26*(4), 367-376. doi:10.2190/mtg0-dcce-

yr29-jlt3

Norvell, N., Belles, D., & Hills, H. (1988). Perceived stress levels and physical symptoms in

      supervisory law enforcement personnel. *Journal of Police Science & Administration*.

O'Connor, D. B., & Conner, M. (2011). Effects of stress on eating behavior. In R. J. Contrada &

      A. Baum (Eds.), The handbook of stress science: Biology, psychology, and health (pp.

      275–286). New York, NY: Springer.

Olafsdottir, G., Cloke, P., & Vögele, C. (2017). Place, green exercise and stress: An exploration

      of lived experience and restorative effects. *Health & Place,46*, 358-365.

      doi:10.1016/j.healthplace.2017.02.006

P Pelletier, J. E., Lytle, L. A., & Laska, M. N. (2015). Stress, Health Risk Behaviors, and Weight

      Status Among Community College Students. *Health Education & Behavior,43*(2), 139-

      144. doi:10.1177/1090198115598983

Phillips, L. A., Chamberland, P. É., Hekler, E. B., Abrams, J., & Eisenberg, M. H. (2016).

      Intrinsic rewards predict exercise via behavioral intentions for initiators but via habit

      strength for maintainers. *Sport, Exercise, and Performance Psychology*, *5*(4), 352.

Pool, E., Brosch, T., Delplanque, S., & Sander, D. (2015). Stress increases cue-triggered

      "wanting" for sweet reward in humans. *Journal of Experimental Psychology: Animal

      Learning and Cognition*, *41*(2), 128.

Pritchard, M. E., & Mcintosh, D. N. (2003). What Predicts Adjustment Among Law Students? A

      Longitudinal Panel Study. *The Journal of Social Psychology,143*(6), 727-745.

      doi:10.1080/00224540309600427

Riordan, B. C., & Carey, K. B. (2018). Wonderland and the rabbit hole: A commentary on

      university students' alcohol use during first year and the early transition to

      university. *Drug and Alcohol Review,38*(1), 34-41. doi:10.1111/dar.12877

Ritter, F. E., Reifers, A. L., Klein, L. C., & Schoelles, M. J. (2007). Lessons from Defining

      Theories of Stress for Cognitive Architectures. *Integrated Models of Cognitive*

      *Systems,*254-262. doi:10.1093/acprof:oso/9780195189193.003.0018

Rosenbaum, D. L., & White, K. S. (2015). The relation of anxiety, depression, and stress to

      binge eating behavior. *Journal of Health Psychology,20*(6), 887-898.

      doi:10.1177/1359105315580212

Schepis, T. S., Tapscott, B. E., & Krishnan-Sarin, S. (2016). Stress-related increases in risk

      taking and attentional failures predict earlier relapse to smoking in young adults: A pilot

      investigation. *Experimental and Clinical Psychopharmacology,24*(2), 110-119.

      doi:10.1037/pha0000066

Schlotz, W., Yim, I. S., Zoccola, P. M., Jansen, L., & Schulz, P. (2011). The perceived stress

      reactivity scale: Measurement invariance, stability, and validity in three

      countries. *Psychological assessment*, *23*(1), 80.

Schrieks, I., Joosten, M., Klöpping-Ketelaars, W., Witkamp, R., & Hendriks, H. (2016).

      Moderate alcohol consumption after a mental stressor attenuates the endocrine stress

      response. *Alcohol,57*, 29-34. doi:10.1016/j.alcohol.2016.10.006

Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organizational*

      Behavior and Human Performance,25(2), 184-215. doi:10.1016/0030-5073(80)90063-x

Seo, D., Ahluwalia, A., Potenza, M. N., & Sinha, R. (2016). Gender differences in neural

      correlates of stress-induced anxiety. *Journal of Neuroscience Research,95*(1-2), 115-125.

      doi:10.1002/jnr.23926

Seo, D., Tsou, K. A., Ansell, E. B., Potenza, M. N., & Sinha, R. (2013). Cumulative Adversity
 Sensitizes Neural Response to Acute Stress: Association with Health
 Symptoms. *Neuropsychopharmacology,39*(3), 670-680. doi:10.1038/npp.2013.250

Sinha, R. (2008). Chronic Stress, Drug Use, and Vulnerability to Addiction. *Annals of the New
 York Academy of Sciences,1141*(1), 105-130. doi:10.1196/annals.1441.030

Sinha, R., & Jastreboff, A. M. (2013). Stress as a Common Risk Factor for Obesity and
 Addiction. *Biological Psychiatry,73*(9), 827-835. doi:10.1016/j.biopsych.2013.01.032

Steptoe, A., Wardle, J., Pollard, T. M., Canaan, L., & Davies, G. (1996). Stress, social support
 and health-related behavior: A study of smoking, alcohol consumption and physical
 exercise. *Journal of Psychosomatic Research,41*(2), 171-180. doi:10.1016/0022-
 3999(96)00095-5

Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and
 exercise. *Sports medicine*, *44*(1), 81-121.

Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A., & Updegraff, J. A.
 (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-
 flight. *Psychological review*, *107*(3), 411.

Todd, M. (2004). Daily Processes in Stress and Smoking: Effects of Negative Events, Nicotine
 Dependence, and Gender. *Psychology of Addictive Behaviors,18*(1), 31-39.
 doi:10.1037/0893-164x.18.1.31

Torres, O. V., & Odell, L. E. (2016). Stress is a principal factor that promotes tobacco use in
 females. *Progress in Neuro-Psychopharmacology and Biological Psychiatry,65*, 260-
 268. doi:10.1016/j.pnpbp.2015.04.005

Tryon, M. S., DeCant, R., & Laugero, K. D. (2013). Having your cake and eating it too: a habit

      of comfort food may link chronic social stress exposure and acute stress-induced cortisol

      hyporesponsiveness. *Physiology & behavior*, *114*, 32-37.

Ulrich-Lai, Y. M., & Herman, J. P. (2009). Neural regulation of endocrine and autonomic stress

      responses. *Nature Reviews Neuroscience,10*(6), 397-409. doi:10.1038/nrn2647

Ulrich-Lai, Y. M., Christiansen, A. M., Ostrander, M. M., Jones, A. A., Jones, K. R., Choi, D.

      C., ... & Solomon, M. B. (2010). Pleasurable behaviors reduce stress via brain reward

      pathways. *Proceedings of the National Academy of Sciences*, 201007740.

Vaughn, A. A., Drake, R. R., & Haydock, S. (2015). College student mental health and quality of

      workplace relationships. *Journal of American College Health,64*(1), 26-37.

      doi:10.1080/07448481.2015.1064126

Wardle, J., & Steptoe, A. (1991). European Health and Behaviour Survey [Database record].

      Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t16932-000

Wemm, S., Fanean, A., Baker, A., Blough, E. R., Mewaldt, S., & Bardi, M. (2013). Problematic

      drinking and physiological responses among female college students. *Alcohol,47*(2), 149-

      157. doi:10.1016/j.alcohol.2012.12.006

Wiggert, N., Wilhelm, F. H., Nakajima, M., & Alabsi, M. (2016). Chronic Smoking, Trait

      Anxiety, and the Physiological Response to Stress. *Substance Use & Misuse,51*(12),

      1619-1628. doi:10.1080/10826084.2016.1191511

Appendix

Percieved Stress Scale

0 = Never   1 = Almost Never   2 = Sometimes   3 = Fairly Often   4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?

2. In the last month, how often have you felt that you were unable to control the important things in your life?

3. In the last month, how often have you felt nervous and "stressed"?

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

5. In the last month, how often have you felt that things were going your way?

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

7. In the last month, how often have you been able to control irritations in your life?

8. In the last month, how often have you felt that you were on top of things?

9. In the last month, how often have you been angered because of things that were outside of your control?

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

European Health and Behaviour Survey

Health behaviours

Substance use

Cigarette smoking (%)

  Non-smokers and ex-smokers

  < 1 per day (+ pipe, cigar)

  1—10 per day

  Desire to reduce smoking (%)

Alcohol consumption (%)

  None

  Special occasions only

  Occasional

  Regular

  Desire to reduce drinking (%)

  Over last 14 days

    Days drinking

    Number of drinks per day

Positive health practices

Exercise over last 14 days (%)

  Number of exercise sessions

  Desire to increase exercise (%)

Sleep time in hours

Sun protection (%)

  Yes

  No

  Never sunbathe

Tooth brushing (%)

  Twice or more per day

  About once a day

  Less than once a day

  Seldom or never

Diet and eating habits

Red meat Consumption (%)

  At least once a day

  Every 2—3 days

  About once a week

  Less than once a week

  Never

Fruit Consumption (%)
   At least once a day
   Every 2—3 days
   About once a week
   Less than once a week
   Never
Adding salt to meals (%)
   Usually
   Sometimes
   Very occasionally
   Never
Conscious effort to eat fibre (%)
Conscious effort to avoid fat and cholesterol (%)
Coffee consumption (%)
   More than 5 cups per day
   1—5 cups per day
   Fewer than 1 per day
   Never
Number of meals
Number of snacks per day
Breakfast (%)
   Almost every day
   Sometimes
   Rarely or never
Dieting (%)

Adolescent Illicit Drug Use, Cigarette Smoking and Alcohol Drinking Behaviour

Questionnaire

(1) Have you ever used an illicit drug? Yes / no

If yes, what is the name of the drug you used? (You can name more than one, if applicable.)

Under what circumstances did you normally use the drug in the last three months? when bored angry tired/stressed up when I had headaches in a party/entertainment mood on weekends any time ''other times'' (Multiple choice is possible.)

How frequent did you use the drug in the past three months? Less than once a day once a day twice a day thrice a day more than three times a day

At what age did you start using the drug?

(2) Have you ever smoked a cigarette? Yes / no

If yes, under what circumstances did you normally smoke cigarettes in the last three months? when bored angry tired/stressed up when I had headaches in a party/entertainment mood on weekends any time ''other times'' (Multiple choice is possible.)

How frequent did you smoke cigarettes in the past three months? Less than once a day once a day twice a day thrice a day more than three times a day

At what age did you start using the drug?

(3) Have you ever consumed alcohol? Yes / no

If yes, what is the name of the alcohol you drank? (You can name more than one, if applicable.)

Under what circumstances did you normally drink alcohol in the last three months? when bored angry tired/stressed up when I had headaches in a party/entertainment mood on weekends any time ''other times'' (Multiple choice is possible.)

How frequent did you drink alcohol in the past three months? Less than once a day once a day

twice a day thrice a day more than three times a day

At what age did you start drinking alcohol?

Were you ever drunk or irritable after drinking alcohol? Yes / no

Initial Briefing

The current study is a research study designed for a psychology undergraduate thesis under the institution National College of Ireland. This study aims to assess the relationship between employment status and negative health behaviours such as alcohol consumption, smoking cigarettes and binge eating in relation to third level students and stress levels. Participation in this study entails answering questions in relation to employment status, stress levels and engagement in negative health behaviours. If you have a diagnosis of substance abuse disorders, alcohol dependency disorders or any stress related illness, it is not recommended that you continue with this study. You are permissible to withdraw from this study if you feel uncomfortable or do not want to take part throughout the completion of the questionnaire however once you have completed the study your data will not be able to be withdraw from the study due to coding of data into anonymised information. All information collected throughout this study will not engage with your personal details apart from age, gender and employment status. Data collected will be completely anonymised for the safety of each participant.

If you are comfortable with the information provided above, you may continue participation in this study. Ticking the box gives the researcher permission to utilise information provided in the current study. Informed consent to use data is important but if you do not comply with this, you will not be able to proceed in participation of the study. Ticking the box also states that you are over the age of 18 before continuing.

Debriefing

Data collected will be used for the current study. Once all data is collected, a full report on the topic will be composed. If you have an interest in receiving a copy of this or have any general queries relating to the study, please email NCIstresshealthstudy@gmail.com.

In the instances of psychological wellbeing, it is advised that you consult the helpline or websites below if any discomfort relating to any of the topics mention within the study was experienced. Thank you for your time and participation.

Helplines/websites

Niteline: https://niteline.ie/

Samaritans helpline: 116 123

QUIT smoking helpline: 1800 201 203

Drink aware website: http://www.drinkaware.ie/