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Smoking, Alcohol, Wellbeing and Academic Attainment

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Abstract
Three studies examined associations between smoking, alcohol consumption, wellbeing and academic attainment of university students. Wellbeing was measured using the Student Wellbeing Process Questionnaire (WPQ) and academic attainment measured by the Grade Point Average (GPA) and perceived work efficiency. In the first study frequency of consuming alcohol, alcohol units, consumers versus non-consumers and drinking more than the recommended safe level were examined. 895 university students (95 males, 797 females; 6 % smokers) participated in the study. When established predictors of wellbeing were co-varied, smoking still had significant effect on academic attainment but not wellbeing. There were no significant effects of frequency of alcohol consumption or high/low alcohol units, and no significant interaction between smoking and alcohol group. Non-consumers of alcohol reported higher negative outcomes but greater work efficiency. Those who consumed more alcohol than the recommended safe limit had lower scores for positive well-being, work efficiency and course stress. A second smaller study examined effects of binge drinking. There was only one significant effect. Regular binge drinkers reported lower work efficiency than the less frequent binge drinkers, who in turn reported lower work efficiency than those who never engaged in binge drinking. A final study examined associations between frequency of hangovers, well-being and attainment. The only significant effect was again on work efficiency, with those who regularly had a hangover being less efficient than those who sometimes had a hangover who were less efficient than those who never had a hangover.

Keywords: Smoking, Alcohol, Binge Drinking, Hangover, Wellbeing, Academic Attainment

1. Introduction

Smith (2019) examined the effects of smoking on well-being and academic attainment. Univariate analyses showed that smoking was associated with greater negative well-being and lower attainment. When established predictors of well-being were co-varied, smoking still had a significant effect on attainment but not well-being. The studies reported here continued this line of research and also considered various parameters of alcohol consumption. The next section provides a brief overview of the approach to well-being adopted here.

The model of wellbeing used in our research has been based on the Demands-Resources-Individual Effects (DRIVE) model (Mark & Smith 2008, 2011, 2012, 2018a, 2018b). This model includes negative characteristics such as exposure to stressors, resources such as control and support, and individual differences reflecting coping style and personality. Negative outcomes such as anxiety and depression are also measured. A more recent development has been to add positive outcomes, such as life satisfaction, positive affect and happiness (Smith 2011a, 2011b; Smith & Wadsworth 2011; Smith et al., 2011; Wadsworth et al., 2010). These positive outcomes

are generally referred to as wellbeing but our approach has considered a wellbeing process that include both positive (e.g. control, support) and negative (e.g. stressors) characteristics, appraisals (life satisfaction and perceived stress), individual differences (e.g. negative coping and positive personality) and outcomes (happiness and anxiety/depression). Other variables can also be included in the model (e.g. resilience, and training attitudes - Nor & Smith 2018; psychological contract fulfilment - Ahmad et al., 2018a, 2018b; ethnicity - Capasso et al., 2016a, 2016b, 2018; Zurlo et al., 2018; work-life balance and burnout - Omosehin & Smith 2019). Health-related behaviours such as sleep also have significant effects, with day-time sleepiness predicting academic attainment and wellbeing (Howells & Smith, 2019).

The Wellbeing Process Questionnaire (WPQ - Williams & Smith 2012, 2016, 2018a, 2018b; Williams, Pendlebury & Smith 2017; Williams, Thomas & Smith 2017) and the Smith Wellbeing Questionnaire (SWELL – Smith & Smith 2017a, 2017b, 2017c; Fan & Smith 2017a, 2017b, 2018) were developed to investigate the well-being process. These questionnaires consist of short scales that have been shown to be correlated with established longer measures. Most of the research has been cross-sectional but longitudinal studies, which provide a better indication of causality, have confirmed the early results (Galvin 2016; Nelson 2017). This approach has also been used with students (Williams, Pendlebury, Thomas & Smith, 2017; Alharbi & Smith, 2019; Nor & Smith, 2019).

Smith (2019) reviewed the literature on smoking, attainment and wellbeing. Results from his study showed that, after established predictors of the outcomes were co-varied, smoking was associated with lower attainment but had no significant effect on wellbeing. Alcohol related harm is a major public health problem (Bell & Britton, 2014; WHO, 2012). Studies in Europe, the USA and Australia have shown a high prevalence of alcohol use disorders, alcohol dependence, stress, anxiety, eating disorders and depression among university students (Kirsch, Doerfler & Truong, 2014; Said, Kypri & Bowman, 2013; Slutske, 2005; Stallman, 2010) compared to their non-university peers (Cvetkovski, Reavley & Jorm, 2012). Studies of the association between alcohol and mental health suggest that individuals with harmful alcohol consumption are more likely to report stress, depression, and anxiety (Pereira et al., 2013). Poor mental health has been associated with academic pressure and irregular sleep patterns (Said, Kypri & Bowman, 2013) and leads to lower academic performance (Cleary et al., 2011). Tembo, Burns and Kalembo (2017) found that a considerable proportion university student consume alcohol at hazardous levels, which was associated with poor academic performance and mental health outcomes.

The aim of the present study was to examine whether smoking and different aspects of alcohol consumption were associated with wellbeing and attainment outcomes when the established predictor variables were statistically controlled.

2. Study 1: Method

This study involved a survey of the well-being of university students using the Student WPQ. It was carried out with the informed consent of the volunteers and approval from the ethics committee, School of Psychology, Cardiff University. Students were asked to complete an online survey presented using Qualtrics software. They were given course credits for completing the survey.

2.1 Participants

The participants were 895 university students (95 males, 797 females; mean age: 19.5 years s.d. 2.2 years; approximately 50% in year 1 and year 2) of whom 6% were smokers. The smokers smoked an average of 3.8 cigarettes a day (range = 1-30). They consumed an average of 10.2 units of alcohol a week (1 unit = 0.5 pint beer; one glass of wine = 2 units; 25ml spirits = 1 unit) with a range of 0-80 units. 7.6% never consumed alcohol, 37.8% drank one day a week, 49.2% 2-3 days a week, 3.8% 4-5 days a week and 1.6% consumed alcohol on 6-7 days a week.

2.2 Measures

A major problem with most of the previous research is that correlated attributes of wellbeing, smoking and alcohol consumption have not been controlled for. Established predictors of wellbeing include exposure to

stressors, negative coping (wishful thinking, avoidance and self-blame), positive personality (self-efficacy, self-esteem and optimism) and social support. Conscientiousness is a well-established predictor of attainment. The present study initially examined univariate association between smoking, alcohol consumption and wellbeing and attainment. Following this the established predictors were co-varied to determine whether any associations with smoking and alcohol consumption were still significant. The following psychosocial measures were derived from the survey:

- Positive Personality (self-efficacy, self-esteem and optimism)
- Social Support
- Exposure to student stressors
- Negative coping
- Positive outcomes
- Negative outcomes
- Self-reported performance efficiency
- Self-reported course stress

Marks for coursework and exams were obtained and combined to give a grade point average (GPA).

2.3 Statistical analysis

Initial univariate analyses examined associations between smoking, alcohol consumption and the predictors of wellbeing as well as the wellbeing outcomes. Subsequent analyses examined smoking, alcohol consumption and the wellbeing and attainment outcomes while controlling for the established predictors (positive personality, exposure to stressors, social support and negative coping).

2.4. Results

The initial analyses used a t-test to compare smokers on the wellbeing predictors and outcomes. There were significant effects with smokers being less conscientious, having lower attainment and work efficiency scores but higher exposure to stressors, negative coping and negative outcome scores. These confirm the results of Smith (2019). Similar analyses were carried out for the alcohol variables (median split of alcohol units and alcohol frequency). Those in the high alcohol units category were less conscientious and report lower work efficiency and course stress, and lower negative outcomes than those in the low alcohol group. Those in the more frequent alcohol consumption group showed similar effects to the analysis based on units. Further analyses compare those who consumed no alcohol at all with consumers. Alcohol consumers reported greater social support. Non-consumers reported less course stress, greater work efficiency but more negative outcomes. A final analysis compared those who consumed more than the recommended safe level (14 units per week) with those with safe levels of consumption. Those who consumed more than the recommended maximum reported lower work efficiency and had a lower GPA. In contrast, they also reported lower course stress.

The next set of analyses involved a MANOVA with smoking and alcohol consumption as the independent variables; conscientiousness, social support, positive personality, exposure to stressors and negative coping were the covariates; and GPA, work efficiency, course stress and positive and negative wellbeing outcomes being the dependent variables. Separate analyses considered alcohol consumption as: low v high alcohol units; low v high frequency of consumption; non-consumers versus consumers; and below or above recommended threshold for safe consumption. The effect of smoking was significant in all analyses and reflected the lower GPA scores obtained by smokers (smoker mean: 60.20 s.e. 1.34; non-smoker mean: 64.23 s.e. 0.22; $p < 0.001$). There were no significant effects of alcohol in the low/high units or frequency analyses. There were also no significant interactions between smoking and alcohol consumption.

The analysis of the non-consumers versus consumers showed that the non-consumers reported significantly higher negative outcome scores but had greater work efficiency (Negative outcomes: Non-consumer mean: 21.63 s.e. 0.60 ; consumer mean: 20.48 s.e 0.33 $p < 0.05$; Work efficiency: Non-consumer mean: 6.41 s.e. 0.22; consumer mean: 5.87 s.e. 0.12 $p < 0.01$). The analysis comparing those who consumed more alcohol than the recommended safe limit also revealed significant effects. Those who consumed more than the

recommended safe limit reported lower positive wellbeing (Positive wellbeing: below limit: mean: 19.41 s.e. 0.14 ; above limit: mean: 19.27 s.e. 0.35 $p < 0.05$), lower work efficiency (Work efficiency: : below limit: mean: 5.73 s.e. 0.10 ; above limit: mean: 5.66 s.e. 0.24 $p < 0.001$) and lower course stress (Course stress: : below limit: mean: 6.93 s.e. 0.09 ; above limit: mean: 6.58 s.e. 0.21 $p < 0.05$).

Overall, the present findings confirm that smoking is associated with lower academic attainment but not reduced wellbeing. This effect was not modified by alcohol consumption. The effect of alcohol consumption depended on how it was categorised. Comparison of low versus high consumption, or frequent versus less frequent, based on median splits showed little effect. It was only when the tail of the distributions were examined that significant effects became apparent. Non-consumers reported more negative wellbeing but greater work efficiency. Those who consumed more alcohol than the recommended limit reported lower positive wellbeing and lower work efficiency but less course stress.

The next study examined a specific type of alcohol consumption, binge drinking, to determine whether this is related to academic attainment and wellbeing. Binge drinking (also called heavy episodic drinking, risky single-occasion drinking etc.) is a major public health problem. Mostly occurring among young people at weekends, binge drinking increases the risk of stress, anxiety, traumatic events and depression (Kuntsche et al., 2017).

3. Study 2: Binge drinking methodology

This study involved a survey of the well-being and attainment of university students using the Student WPQ. It was carried out with the informed consent of the volunteers and approval from the ethics committee, School of Psychology, Cardiff University. Students were asked to complete an online survey presented using Qualtrics software. They were given course credits for completing the survey.

3.1 Participants

The participants were 352 university students (43 males, 309 females; mean age: 19.1 years, range 17-46 years; approximately 50% in year 1 and year 2) of whom 12.2% were smokers. The smokers smoked an average of 4.0 cigarettes a day (range = 1-30). They consumed an average of 9.1 units of alcohol a week with a range of 0-80 units. 12.5% never consumed alcohol, 36.4% drank one day a week, 46.0% 2-3 days a week, 4.5% 4-5 days a week and 0.3% consumed alcohol on 6-7 days a week. 22.7% never engaged in binge drinking (drinking rapidly over a short period of time), 16.2% rarely carried out binge drinking, 27.3% were binge drinkers every few weeks and 33.8% carried out binge drinking every week.

3.2 Measures

The psychosocial measures were identical to the previous study.

3.2 Results

The multi-variate analyses comparing those who never engaged in binge drinking with those who were frequent and less frequent binge drinkers only revealed one significant effect. Regular binge drinkers reported lower work efficiency than the less frequent binge drinkers, who in turn reported lower work efficiency than those who never engaged in binge drinking (Work efficiency: Never binge: mean: 6.26 s.e. 0.24; Rarely binge: mean: 5.67 s.e. 0.27; Every few weeks binge drinkers: mean: 5.55 s.e. 0.22; Frequent binge drinkers: mean: 5.52 s.e. 0.19 $p < 0.05$).

The next study examined the effects of hangovers on wellbeing and attainment. Alcohol-induced hangover, defined by a series of symptoms, is the most commonly reported consequence of excessive alcohol consumption. Alcohol hangovers contribute to reduced wellbeing and poor academic achievement. They may also compromise potentially dangerous daily activities such as driving a car (Verster et al., 2010).

4. Study 3: Hangovers after drinking alcohol

This study involved a survey of the well-being of university students using the Student WPQ. It was carried out with the informed consent of the volunteers and approval from the ethics committee, School of Psychology,

Cardiff University. Students were asked to complete an online survey presented using Qualtrics software. They were given course credits for completing the survey.

4.1 Participants

The participants were 277 university students (32 males, 245 females; mean age: 19.4 years, range 18-45 years; approximately 50% in year 1 and year 2) of whom 10.5% were smokers. The smokers smoked an average of 3.5 cigarettes a day (range = 1-20). They consumed an average of 9.1 units of alcohol a week with a range of 0-50 units. 13% never consumed alcohol, 37.5% drank one day a week, 43.3% 2-3 days a week, 1.1% 4-5 days a week and 0.4% consumed alcohol on 6-7 days a week. 21.7% never suffered from hangovers, 52.3% sometimes had a hangover and 20.6% always had a hangover

4.2 Measures

The psychosocial measures were identical to the previous studies.

4.3 Results

The multi-variate analyses showed that the only effect of frequency of having a hangover was on work efficiency. Those who regularly had a hangover were less efficient than those who sometimes had a hangover who were less efficient than those who never had a hangover (Never: mean 6.44 s.e. 0.30; sometimes: mean: 6.01 s.e. 0.21; always: mean: 5.41 s.e. 0.27 $p < 0.05$).

5. Discussion

The present results confirmed that when established predictors of attainment and wellbeing were included in multivariate analyses, smoking was associated with poorer academic performance but not reduced wellbeing. These findings confirm the importance of conducting multi-variate analyses and controlling for confounders. The effects of alcohol consumption were less obvious. Analyses splitting the sample into high/low groups relating to frequency and amount of consumption revealed no significant effects. It was only when the tail of the distribution was examined that effects of the different alcohol groups emerged. When those who consumed no alcohol were compared with consumers, the non-consumers were found to have greater negative wellbeing but worked more efficiently. Similarly, binge drinking and having hangovers were related to work efficiency but no other variables. Only 10% of the sample consumed more alcohol than the recommended safe limit and this may explain the differences from studies with much higher levels of harmful consumption (e.g. Tembo, Burns & Kalembo, 2017)

One limitation of the studies was that they were cross-sectional and further longitudinal studies, preferably with appropriate interventions, are required. The samples used in the present study were young adults (university students) and future research should investigate older working adults who may have been smoking and drinking for longer periods of time. Another limitation is that the present study does not inform on the underlying mechanisms linking smoking and poorer academic attainment and alcohol consumption and poorer work efficiency. Future research should address the underlying mechanisms and use a multi-variate longitudinal approach to assess the benefits of smoking cessation and education about alcohol consumption. There is also a need to examine other health-related behaviours, such as drug use, as negative habits rarely occur in isolation and there is a need to examine combined effects of the different behaviours.

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