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Smoking, Wellbeing and Academic Attainment

Andrew P. Smith

1 School of Psychology, Cardiff University

Corresponding Author: Andrew Smith, Centre for Occupational and Health Psychology, School of Psychology, Cardiff University, 63 Park Place, Cardiff CF10 3AS, UK. Tel: +442920874757. E-mail: smithap@cardiff.ac.uk

Abstract
The research described here examined associations between smoking, wellbeing and academic attainment of university students. Wellbeing was investigated using the Student Wellbeing Process Questionnaire (WPQ) and academic attainment was assessed using Grade Point Average (GPA) and perceptions of work efficiency. 923 university students (94 males, 829 females; approximately 10% smokers) participated in the study. Univariate analyses showed that smokers were less conscientious, had lower positive wellbeing and lower attainment scores. Smokers also reported greater exposure to stressors, more negative coping and higher negative outcome scores. When established predictors of wellbeing (positive personality; social support; exposure to stressors and negative coping) and attainment (being conscientious) were co-varied, smoking still had a significant effect on academic attainment but not the wellbeing outcomes.

Keywords: Smoking, Wellbeing, Academic Attainment

1. Introduction

Recent research on wellbeing has considered it as a process and measured it using the Wellbeing Process Questionnaire (WPQ - Williams & Smith 2012, 2016, 2018a, 2018b; Williams, Pendlebury & Smith 2017; Williams, Thomas & Smith 2017) or the Smith Wellbeing Questionnaire (SWELL – Smith & Smith 2017a, 2017b, 2017c; Fan & Smith 2017a, 2017b, 2018). Versions of these questionnaires have been developed for research with students (Williams, Pendlebury, Thomas & Smith, 2017; Alharbi & Smith, 2019; Nor & Smith, 2019) and a key feature of these measures has been that they consist of short scales which have been shown to be correlated with longer established measuring instruments. These short questionnaires have been shown to have good reliability and validity. They have been used extensively in cross-sectional research and the WPQ has also been used in longitudinal studies which provide a better indication of causality (Galvin 2016; Nelson 2017). The underlying model of wellbeing was based on occupational stress research and the development of the Demands-Resources-Individual Effects (DRIVE) model (Mark & Smith 2008, 2011, 2012, 2018a, 2018b). This model emphasised the importance of measuring potential negative characteristics such as exposure to stressors, resources that help one deal with challenges, such as control and support, and individual differences in coping style and personality. An important feature of the model was that it is relatively easy to add new variables. This has led to the study of 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 to wellbeing has been to include both positive and negative characteristics (e.g. demands, control and support), appraisals (perceived stress and life satisfaction), individual differences (e.g. positive personality and negative coping) and outcomes (anxiety/depression and happiness). Other variables that have been included in the model relate to burnout and work-life balance (Omosehin & Smith 2019), psychological contract fulfilment (Ahmad et al., 2018a, 2018b), ethnicity (Capasso et al., 2016a, 2016b, 2018; Zurlo et al., 2018), resilience, and training attitudes (Nor & Smith 2018).

One important area that needs to be included in the model relates to health-related behaviours. Sleep has been shown to be important, with day-time sleepiness predicting wellbeing and academic attainment (Howells & Smith, 2019). The aim of the present study was to examine whether smoking was associated with wellbeing and attainment outcomes when the established predictor variables were statistically controlled. There is a large literature showing that smoking is associated with lower academic attainment (e.g. Busch et al., 2017; Sabado et al., 2017; Orpinas et al., 2016; Reingle-Gonzalez et al., 2016; & Stiby et al., 2015), although it should be noted that some studies have not found this result (e.g. Radovanovic, Dimitrijevic & Jamborcic, 1983; Warburton, Wesnes & Revell, 1984). Much of the literature on smoking and wellbeing has examined mental health, with studies showing that smoking is associated with more mental health problems (e.g. Fidalgo et al., 2018; Lovell et al., 2018). Other research has focused on specific aspects of wellbeing (e.g. happiness – Stickley et al., 2015; life satisfaction – Rissanen et al., 2013) and the general conclusion has been that smoking is associated with reduced wellbeing. Indeed, low levels of wellbeing may be a factor that maintains smoking behaviour (Brook et al., 2011). A major problem with most of the previous research is that correlated attributes of wellbeing and smoking 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 and wellbeing and attainment. Following this the established predictors were co-varied to determine whether any associations with smoking were still significant.

2. 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 923 university students (94 males, 829 females; mean age: 19.25 years s.d. 2.2 years; approximately 50% in year 1 and year 2) of whom 90 were smokers. The smokers smoked an average of 3.6 cigarettes a day (range = 1-30).

2.2 Measures

The following 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 and the predictors of wellbeing as well as the wellbeing outcomes. Subsequent analyses examined smoking and the wellbeing and attainment outcomes while
controlling for the established predictors (positive personality, exposure to stressors, social support and negative coping).

3. Results

The initial analyses used a t-test to compare smokers on the wellbeing predictors and outcomes. The results are shown in Table 1 and there were significant effects with smokers being less conscientious, having lower positive outcome scores, lower attainment scores but higher stress, negative coping and negative outcome scores.

Table 1. Significant effects of smoking (scores are the means and s.e.s)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Smokers</th>
<th>Non-smokers</th>
<th>Significance (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>6.03 (0.18)</td>
<td>6.76 (0.06)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Positive personality</td>
<td>18.37 (0.43)</td>
<td>19.06 (0.15)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Negative coping</td>
<td>19.25 (0.50)</td>
<td>17.10 (0.16)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Social support</td>
<td>32.90 (0.69)</td>
<td>33.75 (0.19)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Stressors</td>
<td>38.20 (1.05)</td>
<td>34.95 (0.33)</td>
<td>p &lt; 0.005</td>
</tr>
<tr>
<td>Negative outcomes</td>
<td>21.9 (0.71)</td>
<td>19.73 (0.23)</td>
<td>p &lt; 0.005</td>
</tr>
<tr>
<td>Positive outcomes</td>
<td>18.75 (0.38)</td>
<td>19.70 (0.12)</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Course stress</td>
<td>7.00 (0.17)</td>
<td>7.00 (0.06)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Work efficiency</td>
<td>5.10 (0.21)</td>
<td>6.17 (0.06)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>GPA (%)</td>
<td>60.40 (1.03)</td>
<td>63.10 (0.24)</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

The next analysis involved a MANOVA with smoking as the independent variable, positive personality, social support, stressors, negative coping and conscientiousness as the covariates, and negative outcomes, positive outcomes, course stress, work efficiency and GPA as the dependent variables. The only significant effects of smoking were for GPA and work efficiency (see Table 2).

Table 2. Significant effects of smoking after adjustment of established predictors (adjusted means and s.e.s)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Smokers</th>
<th>Non-smokers</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA (%)</td>
<td>61.14 (0.76)</td>
<td>63.02 (0.25)</td>
<td>p&lt; 0.02</td>
</tr>
<tr>
<td>Work efficiency</td>
<td>5.43 (0.19)</td>
<td>6.13 (0.06)</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>

4. Discussion

The univariate results from the present study showed that smoking was associated with reduced wellbeing and poorer academic performance. However, smoking was also associated with established predictors of negative wellbeing (exposure to stressors and negative coping) and attainment (conscientiousness). When these variables were co-varied the effects of smoking on wellbeing were no longer significant. However, the association between smoking and GPA and working efficiency were still significant. These results demonstrate the importance of conducting multi-variate analyses and controlling for confounders. One limitation of the study was that it was cross-sectional and future research should be longitudinal, preferably with a smoking cessation intervention. Another limitation is that the present study does not inform on the underlying mechanisms linking smoking and poorer academic attainment. These mechanisms could take several forms. First, there are toxicological mechanisms related to inhalation of tobacco smoke that could influence the brain and behaviour. Nicotine withdrawal during periods of assessment may also reduce performance. Finally, there may other characteristics of smoking that have not been measured here that can account for the poor academic performance. Future research should address the underlying mechanisms and use a multi-variate longitudinal approach to assess the benefits of smoking cessation. There is also a need to examine other health-related behaviours as negative ones rarely occur in isolation and there is a need to examine combined effects of risk factors.
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