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Starting university with high eating self-regulatory skills protects students against unhealthy dietary intake and substantial weight gain over 6 months

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ABSTRACT

Background: There is consistent evidence that suggests first year students are at risk of weight gain, but the reasons for this vulnerability are still unclear. This study aimed to explore whether the ability to regulate eating behaviours is a predictor of weight and dietary changes in first year undergraduate students.

Methods: First year undergraduate students from universities situated in London were invited to complete a survey at the beginning of the academic year and at 6-month follow-up. Each survey included the Self-Regulation of Eating Behaviour Questionnaire, food frequency questions, socio-demographic questions and anthropometric questions. Linear and logistic regressions were performed to explore the associations between baseline eating self-regulatory skills and weight and dietary changes.

Results: 481 first year undergraduate students took part in the study. Students who entered university with higher eating self-regulatory skills were more likely to maintain or achieve a higher fruit and vegetable (OR = 1.8, $p = 0.007$) and a lower sweet and salty snack (OR = 1.9, $p = 0.001$) intake over the course of the first 6 months in university. Higher baseline eating self-regulatory skills were also related to lower weight changes ($\beta = -0.15$, $p = 0.018$) and lower likelihood of gaining 5% initial body weight (OR = 0.52, $p = 0.006$) at 6-month. Additionally, self-regulatory skills moderated the relationship between baseline BMI and weight changes ($\beta = -0.25$, $p \leq 0.001$) and between baseline BMI and 5% weight gain (OR = 0.82, $p = 0.008$).

Conclusions: Starting university with higher eating self-regulatory skills may help students to maintain or achieve a healthy diet and protect them against substantial weight gain, especially among students with overweight.

1. Introduction

The transition to university is a period characterised by changes in lifestyle, environment and responsibilities. In the late 1990's, a belief that this period leads to dramatic weight gain, identified as the 'Freshman 15 pounds (6.8kg)' was widely spread by newspapers and academic articles (Brown, 2008; Graham & Jones, 2002). More recent studies have indicated a lower, but still significant, weight gain among students starting university (Crombie, Ilich, Dutton, Panton, & Abood, 2009; Morrow et al., 2006). A review and meta-analysis (Vella-Zarb & Elgar, 2009) found students gain on average 1.75 kg (95%CI 1.73; 1.77) over the course of their first year.

However, the reasons for this vulnerability to weight gain and individual differences in the experience are still unclear. Reviews suggest weight gain in first year undergraduate students is associated with high baseline weight, dietary changes, decreases in physical activity, living in residential halls, level of stress, and dietary restraint (Crombie et al., 2009; Vella-Zarb & Elgar, 2009). Genetic influences may also play a role (Meisel, Beeken, van Jaarsveld, & Wardle, 2015). However, higher baseline weight is not always a predictor of weight gain. A study conducted with 120 first year students from the UK found that students with a lower baseline weight actually gained the most weight over a 12-month period (Finlayson, Cecil, Higgs, Hill, & Hetherington, 2012). Regarding the relationship between dietary changes and weight gain, a study with first year students from the United States found that weight gain in male students (N = 140) was predicted by an increase in alcohol consumption whereas in female students (N = 256) it was predicted by lower fruit and vegetable intake (Economos, Hildebrandt, & Hyatt, 2008). In contrast, some studies have found that dietary behaviours neither change nor predict weight gain in first year undergraduate students (Boyce & Kuijer, 2015; Nikolaou, Hankey, & Lean, 2015). These inconsistencies may be due to a lack of power to detect changes

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or due to the use of different measures to assess weight, physical activity and dietary behaviours.

However, it is important to note that weight gain over the first year at university may not always represent a concerning change. Small weight gains may represent natural daily weight fluctuation (Orsama et al., 2014) or even be a positive change for people who had a very low body mass index (BMI). There is also evidence that some students may experience weight loss during this transition (Gillen & Lefkowitz, 2011; Vadeboncoeur, Foster, & Townsend, 2016). Thus, further research into the mechanisms of weight change (as opposed to just the drivers of weight gain) during the transition to university is warranted.

It has been suggested that stress may increase both risk of weight loss and weight gain (Serlachius, Hamer, & Wardle, 2007). According to Boyce and Kuijer (2015) people who enter university with higher levels of stress and lower BMI may lose weight, while those with higher BMI may gain weight. Studies have also shown that increased social support may be a possible buffer of the negative effect of stress on weight gain over the freshman year, especially among men (Darling, Fahrenkamp, Wilson, Karazsia, & Sato, 2017). Increases in physical activity and decreases in calorie intake may also lead to weight loss during the transition to university (Hootman, Guertin, & Cassano, 2017). However, the transition to university has also been linked to an increased risk of developing eating disorders (Delinsky & Wilson, 2008; Striegel-Moore, Silberstein, & Rodin, 1986). Delinsky and Wilson (2008) found that women with higher dietary restraint and concerns about their weight during the first year at university were more likely to lose weight and show disordered eating symptoms.

However, with respect to dietary restraint, that is - the intention to eat less in order to stay in shape (Herman & Polivy, 1975), and its relationship with weight changes, other studies have shown conflicting results. For example, Provencher et al. (2009) found in a cohort of first year students (N = 2921) from Canada that high levels of dietary restraint were related to both weight loss and weight gain. Researchers have suggested that some restraint scales, such as the Restraint Scale (Herman & Polivy, 1975), assess a range of personality traits and eating tendencies (such as the susceptibility to overeat and weight fluctuation) rather than the intent to exercise dietary restraint, and that this may have contributed to mixed results (Hagan, Forbush, & Chen, 2017; Laessle, Tuschl, Kotthaus, & Pirke, 1989; Williamson et al., 2007). As a result, researchers have developed psychometric scales assessing just dietary restraint and no other traits, but this has not solved the issue of inconsistent results for the relationship with weight control (Johnson, Pratt, & Wardle, 2012; Williamson et al., 2007). Some authors have argued that inconsistent results may be because some restrained dieters have higher eating self-regulatory skills than others and may be more capable of maintaining or losing weight (Hays & Roberts, 2008; Johnson et al., 2012; Phelan et al., 2009).

Self-regulatory skills are often conceptualized as the individual's ability to alter their behaviour, thoughts, feelings and attention in the pursuit of their personal goals (Boekaerts, Maes, & Karoly, 2005; Carver & Scheier, 2001; De Vet et al., 2014; Moilanen, 2007), for example, the ability to inhibit a desire to have a sweet in order to stay healthy. Most theoretical models define self-regulatory skills as a continual and multilevel process involving self-monitoring; appraising progress and attempting to approach or maintain the desired goal; making adjustments to it when necessary or giving up (Bandura, 1991; Baumeister, Vohs, & Tice, 2007; Rasmussen, Wrosch, Scheier, & Carver, 2006; Schwarzer, 2008).

Given the dramatic changes in routine, environment and social life experienced by first year undergraduate students, some level of self-regulatory skills may be required to keep healthy habits and/or build new ones due to disruptions of old habitual behaviours. The new environment may also increase demands on self-regulation to inhibit impulses towards food temptations, since students can experience a high exposure to unhealthy food options at university (Grech, Hebden, Roy, & Allman-Farinelli, 2016).

A recent online study conducted with 923 adults in the UK showed that higher eating self-regulatory skills were related to higher fruit and vegetables intake and to lower unhealthy snack intake and sugary drinks intake, as well as lower BMI (Kliemann, Beeken, Wardle, & Johnson, 2016). Similar results were found in studies conducted specifically with undergraduate students (Price, Higgs, & Lee, 2017; Schroder, Ollis, & Davies, 2013; Tomasone, Meikle, & Bray, 2015). However, the majority of these studies had cross-sectional designs, which cannot indicate causality. Additionally, although the transition to university tends to promote weight gain and unhealthy dietary changes (Vella-Zarb & Elgar, 2009), no study has assessed the associations between self-regulatory skills and weight and dietary changes among first year undergraduate students.

Therefore, this study aimed to examine relationships between eating self-regulatory skills and changes in weight and dietary behaviours over 6 months in an online longitudinal cohort of undergraduate students from London, UK. This study hypothesised that high eating self-regulatory skills at baseline would prevent weight gain and be related to weight loss, as well as, help people to achieve or maintain healthier dietary behaviours over the first 6 months at university. People who worsened their dietary behaviours and those who maintained an unhealthy diet over the first 6 months at university would have lower eating self-regulatory skills at baseline.

2. Material and methods

2.1. Participants

Participants were first year undergraduate students from 13 universities within London, chosen based on convenience and having at least one university representing each of the seven regions of London. The Departments and/or Faculties within each university were individually contacted and invited to take part in the study. All interested students aged between 18 and 30 years able to give informed consent and willing to complete the online survey twice over a 6-month period were eligible. Participants who were 30 years old or over were excluded, as older students might not be as susceptible to weight gain as younger students (Hulanicka & Kotlarz, 1983). A criterion for height changes was established to allow for reporting errors (± 1 cm); participants with a height change ≤ -1 or ≥ 4 cm were excluded from the analyses.

2.2. Procedure

The Departments or Faculties that agreed to take part in the study invited all of their first year undergraduate students to complete the online survey at the beginning of the academic year (September/October 2015) through an email circular. Interested students who consented to participate were directed to the online survey on Survey Monkey (2015). At 6-month follow-up (March/April 2016), participants were invited to complete the online survey for the second time. As an incentive, participants had the chance to enter a draw to win a £20 high street voucher. Ethical approval was granted by the University College London Research Ethics Committee.

2.3. Measures

2.3.1. Predictor variable

Eating self-regulatory skills at baseline was assessed using the valid and reliable 5-item Self-Regulation of Eating Behaviour Questionnaire (SREBQ) (Kliemann et al., 2016). Response options ranged from 1 (never) to 5 (always). Total mean score was calculated. The SREBQ demonstrated good internal reliability at baseline (Cronbach's alpha = 0.73).