Burnout, Eating Behaviour Traits and Dietary Patterns

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Abstract

Purpose: This exploratory research investigated whether burnout and eating behaviour traits were associated with food intake.

Design: Participants (N=109) 78% female, mean age 39 years, were recruited from various occupations within a United Kingdom (UK) university to complete an on-line survey. Dietary habits were measured using Food Frequency Questionnaire (FFQ), burnout using the Maslach Burnout Inventory (MBI) and eating behaviour traits using the Three Factor Eating Questionnaire R18 (TFEQ).

Findings: Principal Component Analyses of FFQ responses revealed four dietary patterns: 1. Fast/Junk Food (+ chicken and low fruit/vegetables); 2. Meat/Fish; 3. Dairy/Grains; 4. Beans/Nuts. Dietary patterns were examined using multiple regression analysis as outcome variables with age, gender, burnout and eating behaviour traits as explanatory variables. More frequent consumption of 'junk/fast food' was associated with lower TFEQ-Cognitive Restraint, higher TFEQ-Uncontrolled Eating, lower MBI-Emotional Exhaustion and higher MBI-Depersonalisation. More frequent consumption of beans/nuts was associated with higher TFEQ-Uncontrolled Eating and higher MBI-Emotional Exhaustion. Models for meat/fish and grains/dairy dietary patterns were not significant.

Limitations/Implications: Burnout may need to be considered to reduce junk food consumption in higher education employees. Causality between burnout, eating behaviour traits and food consumption requires further investigation on larger samples.

Originality: This appears the first study to have explored associations between burnout, eating behaviour traits and dietary patterns.

Paper type: Research article.

Keywords: Burnout; Eating Traits; Food Choice; Dietary Patterns; Survey.

Burnout, Eating Behaviour Traits and Food Choice

Introduction

Occupation-related factors contribute substantially to health and well-being (Shuck *et al.,* 2017) and this is reflected in rising incidence of chronic illness among academics (Brown and Leigh, 2018). University staff experience relatively high workload demands (Ahsan *et al.,* 2009) which may adversely affect job performance and produce *burnout* (Maslach and Leiter, 2014). Burnout is "a syndrome of emotional exhaustion, depersonalisation and reduced accomplishment which is a special risk for individuals who work with other people in some capacity" (Leiter and Maslach, 1998: pp 347). The Job Demand Resources Model (Demerouti *et al.,* 2001) holds that greater effort is required to do a job where demands are high (eg. time constraints; role conflict; workload etc), leading to exhaustion and if resources are scarce, leading to disengagement. Occupational burnout occurs, therefore, when job demands exceed employees' resources for managing tasks (Schaufeli, 2017) and is common in occupations involving numerous direct interactions with people, such as those who work in education (Schaufeli and Salanova, 2014; Childs and Stoeber, 2012). Whereas resources are associated with greater commitment to the job and less burnout (Bakker *et al.,* 2003), high job demands lead to burnout and associated detriment to health (Schaufeli, 2017). Recent meta-analysis (Lesener *et al.,* 2018) has implied that the relationship between job demands or resources and burnout is reciprocal. Whist job demands lead to reduced work engagement, which increases job demands, resources improve well-being, which leads to further investment into work. Burnout may encourage less healthy eating behaviours (Alexandrova-Karamanova *et al.,* 2016;

Stewart-Knox, 2014; Gorter *et al.,* 2000) and has been linked to overeating (Mikalauskas *et al.,* 2018; Armenta-Hernandez *et al.,* 2018; Warren *et al.,* 2013).

Eating behaviour traits can modulate food intake and could influence how individuals' eating patterns respond to burnout. Eating behaviour traits are individual differences assumed to be associated with appetite control (Drapeau *et al.,* 2019). Disinhibition is an eating trait associated with poor appetite control characterized by 'Uncontrolled Eating' (UE) and Emotional Eating (EE). UE refers to the tendency to overeat in response to external food cues and food palatability while EE refers to the tendency to overeat in response to mood. Both EE and UE can be associated with weight gain (Bryant *et al.*, 2008). Cognitive Restraint in contrast, is characterized by controlled eating, cognitively restricting food intake to control body weight (Bryant *et al.,* 2008). Emotional Eating, Uncontrolled Eating and Cognitive Restraint are measured by the Three Factor Eating Questionnaire (Stunkard and Messick, 1985). Emotional states can increase food intake in restrained/emotional eaters and decrease in non-restrained/non-emotional eaters (Kristanto *et al.,* 2016; Aldao and Nolen-Hoeksema, 2010). One form of Disinhibition is Emotional Eating (EE) and is measured by the TFEQ revised TFEQr18 (Cappelleri *et al.,* 2009; Karlsson *et al.,* 2000). Individuals with a high level of Disinhibition (uncontrolled eating) and Restraint (controlled eating) may be vulnerable to overeating in response to negative emotion (Kozak *et al.,* 2017; Järvelä-Reijonen *et al.,* 2016; Bryant *et al.,* 2010; and, 2008). Evidence for the impact of Cognitive Restraint on food intake, however, is mixed. On the one hand, Cognitive Restraint has been related to increased consumption of more healthful, and lower fat, low energy foods (e.g. Aguirre *et al.,* 2017; Bernstein *et al.,* 2015; French *et al.,* 2014;

Cornelis *et al.,* 2014), supporting a behavioural profile which favours weight regulation. Whilst on the other hand, high Cognitive Restraint has been associated with poorer diet quality, poor dietary regulation and larger portion size (e.g. Guillocheau *et al.,* 2018; Lewis *et al.,* 2015; Jones *et al.,* 2013). The disparate response of those with high Restraint, could at least in part, be a consequence of other eating behaviours an individual processes, along with their emotional response (Bryant *et al.,* in press). More consistently, individuals who score highly on EE, show a tendency to consume high-fat and sweet foods (Järvelä-Reijonen *et al.,* 2016; Camilleri *et al.,* 2014). Emotional eaters, therefore, may be more likely to seek solace from food in the presence of burnout (Bond *et al.,* 2001). In keeping with this theory, periods of high workloads have been associated with greater energy and fat intake (Wang and Le, 2015; Ng and Jeffery, 2003), particularly in people with high Disinhibition (Habhab *et al.,* 2009; Wardle *et al.,* 2000). Evidence for an association between burnout (MBI) and EE (TFEQr18) (Kristanto *et al.,* 2016; Nevanperä *et al.,* 2012) and uncontrolled eating (Nevanperä *et al.,* 2012), suggests Disinhibition and Cognitive Restraint could be important when explaining eating patterns under conditions of burnout.

Research on burnout and health has mainly focussed upon health professionals (Mikalauskas *et al.,* 2018; Alexandrova-Karamanova *et al.,* 2016; Cecil *et al.,* 2014; Warren *et al.,* 2013; Gorter *et al.,* 2000). Most existing studies on burnout and eating have not assessed actual dietary habits and/or dietary patterns (eg. Mikalauskas *et al.,* 2018; Kristanto *et al.,* 2016; Nevanpera *et al.,* 2012; Gorter *et al.,* 2000). This exploratory study, therefore, has explored associations between burnout, eating traits and dietary patterns in employees within higher education with a view to intervention. It

was hypothesized that burnout, emotional eating, uncontrolled eating and Cognitive Restraint would be associated with eating patterns.

Method

Sampling

Recruitment was via email and newsletter from among University employee groups (academic; administrative; ancillary) and all grades. Those with a dietary-related health condition (eg. Diabetes; Coeliac's disease; food allergy) or on a prescribed diet (eg. low cholesterol; gluten free) were excluded. Otherwise any employee was free to volunteer and be included. Respondents (N=109) were 78% female, average age 39.50 years, 79% of whom had a degree and/or higher degree. A majority (64.5%) were in administrative roles, one third (34%) held academic posts and a small proportion (1.5%) unclassified.

Materials

The design was cross-sectional using self-administered questionnaire. Questions were on demographics, Perceived Stress, Emotion Regulation, Burnout, Eating Behaviour Traits and dietary habits. Emotion Regulation data were omitted as incomplete. Perceived Stress was removed from this analysis because of its low Cronbach's alpha (0.547).

The Maslach Burnout Inventory (MBI) (Maslach and Leiter, 2014; Maslach and Jackson, 1986) is a 22-item scale that assesses burnout on three subscales: 1) Emotional

exhaustion (EE) (9 items) - feelings of being emotionally overextended and exhausted by work eg. 'I feel emotionally drained/used up/fatigued at the end of the day'; 2) Depersonalisation (DP) (5 items) - an unfeeling and impersonal response toward recipients of services eg. 'I can easily understand how my recipients feel about things/I feel I treat some recipients as if they were impersonal objects'/'working with people all day is a strain for me'; 3) Personal accomplishment (PA) (8 items) competence and achievement in one's work eg. 'I feel I am positively influencing other people's lives through my work'/'I feel exhilarated after working closely with my recipients'/'I have accomplished many worthwhile things in this job'. Responses were on a 7-point Likert scale ranging from "never" (= 0) to "daily" (= 6). Scores, one for each subscale, were entered separately into analyses as independent variables. The MBI has been shown to have good validity across different studies (Lesener *et al.,* 2019) and high internal consistency for the EE and DP scales across EU countries (Alexandrova-Karamanova *et al.,* 2016). Internal consistency of the reported data was high. Cronbach's α = 0.91 (EE); 0.78 (DP); 0.83 (PA).

Three Factor Eating Questionnaire Revised 18 (TFEQr18) (Karlsson, *et al.,* 2000) measures eating traits and is a shortened and revised version of the 51-item original (Stunkard and Messick, 1985).. Responses were on a four-point scale (1-4), with higher values indicating greater levels of the eating behaviour trait. Item scores were summated into scale scores for three factors: "Cognitive Restraint" (CR) 6 items; "Uncontrolled Eating" (UE) 9 items; "Emotional Eating" (EE) 3 items. Raw scores were transformed to a 0–100 scale [(lowest possible raw score/possible raw score range) x 100]. Scores, one for each subscale, were entered separately into the analyses as

independent variables. Internal consistency of the subscales was good. Cronbach's α = 0.83 (CR); 0.89 (UE); 0.89 (EE).

Food Frequency Questionnaire (FFQ) (Adapted from Tresserra-Rimbau, *et al.,* 2013**)** was employed to measure how often 19 food groups (Table 1) were consumed during the previous three months. Responses were on a Likert scale: never; less than 1 time per week; 1-6 times per week; 1-3 times per day; 4 or more times per day.

Procedure

Ethical approval was granted by the University ethical committee. Volunteers were given an information sheet and required to give prior, written consent. Data were collected on-line during April–August 2015.

Data analysis

Data were analysed using Jamovi (version 0.9.5.12) and R (version 3.5.1). Principal Component Analysis (PCA) with Varimax rotation using R library "psych" (Revelle, 2018) was used to determine dietary patterns from FFQ data. Taking factor loadings of 0.5 or above and Eigenvalues >1, initial results indicated 6 components. Given two components that explained the least variances were not interpretable, the PCA was re-run assuming 4 components which together accounted for 55.7 % of the total variance in frequency of consumption. Taking factor loadings of 0.5 as cut-off, there were 4 factors (Table 1), each representing a distinct dietary pattern: 1. Junk/Fast Food +

Chicken and Low Fruit/Vegetables; 2. Meat/Fish; 3. Grains/Dairy; 4. Beans/Nuts. Neither eggs nor sweets loaded onto any factor. The 4 component scores (dietary patterns) were entered into multiple regression analyses as dependent variables. Multiple linear regression analyses were then undertaken to determine associations between gender, age, burnout (MBI) and eating behaviour traits (TFEQ) (independent variables) and the four dietary patterns dependent variables). Significance was assumed at $p<0.05$. See Table 2 for the descriptive statistics of the independent variables.

For all four models, the assumptions of linearity, homoscedasticity, and normality were acceptable based on results of normal Q-Q plots, residual plots, the score test for non-constant error variance (Cook and Weisberg, 1983), and the global validation of linear model assumption test (Peña and Slate, 2006). Independence was assumed by design. Results of VIF indicated no problem of multicollinearity (< 10). Outliers and influential cases were examined using Cook's distance, hat statistic, added-variable plots, and influence plots. Although there were outliers based on Cook's distance, these data points were included in the analyses because the largest absolute studentised residual test showed that these outliers were not significant using the Bonferroni $p < .05$ criterion. The added-variable plots and influence plots indicated these outliers did not have a disproportionate impact on the model parameters.

Insert Table 1 and 2

Results

Determinants of dietary patterns

1. Fast/Junk Food

More frequent consumption of the 'junk/fast food' (+ chicken and less-frequent fruit and veg) pattern was associated with lower TFEQ-Restrained Eating (b = -0.012; SE = 0.004; t = -2.975; p = 0.004), higher TFEQ-Uncontrolled Eating (b = 0.014; SE = 0.005; t = 2.656; p = 0.010), lower MBI-Exhaustion (b = -0.024; SE = 0.010; t = -2.516; p = 0.014) and higher MBI-Depersonalisation (b = 0.049; SE = 0.020; t = 2.437; p = 0.017) (Table 3). This model explained 44.1% of variance (adjusted R^2 = 0.38) in junk/fast food consumption (F(8, 77) = 7.597; SE = 0.80, $p < 0.001$).

2. Meat/Fish

More frequent consumption of the meat/fish dietary pattern was associated with being male (b = -0.665; SE = 0.269; t = -2.475; p = 0.016) (Table 3). This model explained 11% of variance (adjusted R^2 = 0.03) in meat consumption and was not significant (F (8, 77) = 1.28; SE = 0.964; p = 0.266).

3. Grains/Dairy

More frequent consumption of the grains/dairy dietary pattern was associated with being male (b = -0.671; SE = 0.272; t = -2.468; p = 0.016) (Table 3). This model explained 9% of variance (adjusted R^2 = -0.001) in grains and dairy consumption and was not significant (F (8, 77) = 0.987; SE = 0.974; p=0.453).

4. Beans/Nuts

More frequent consumption of beans/nuts was associated with higher TFEQ-Uncontrolled Eating (b = 0.015; SE = 0.006; t = 2.463; p = 0.016) and higher MB-

Exhaustion (b = 0.027; SE = 0.011; t = 2.460; p = 0.016) (Table 3). This model was significant and predicted 22% of the variance (adjusted R^2 = 0.14) in the frequency of bean and nut consumption (F (8, 77) = 2.697; SE = 0.916; p=0.011).

Further analyses examined the Fast/Junk Food and Beans/Nuts dietary pattern models that indicated overall significance for relative importance of the significant predictors using relative weights (Groemping, 2006). Relative weight estimates the contribution each predictor makes to R^2. For the Fast/Junk Food model, TFEQ-Uncontrolled Eating had the highest relative weight (27.44%), followed by TFEQ-Cognitive Restraint (23.41%), MBI-Depersonalisation (15.24%), and MBI-Exhaustion (6.02%). For the Beans/Nuts model, TFEQ-Uncontrolled Eating again had the highest relative weight (31.94%), followed by MB-Exhaustion (29.31%).

Insert Table 3

Discussion

As predicted, given previous research which has identified associations between burnout and less healthy eating (Alexandrova-Karamanova *et al.,* 2016; Lallukka *et al.,* 2008; Gorter *et al.,* 2000) burnout (depersonalisation) was associated with more frequent fast/junk (+ chicken and less-frequent fruit and veg) food consumption. Contrary to expectation, more frequent consumption of fast food was associated with less burnout (exhaustion). This variable explained a relatively small proportion (6%) of the model. A possible explanation for this finding is that the relationship between

burnout (exhaustion) and fast-food intake is circular. Exhaustion leads to fast-food consumption which serves to counter exhaustion and in doing so, reinforces further intake of fast-food and so on. Contrary to previous research which has found that males consume more fast-food than females (Daniuseviciute-Brazaite and Abromaitiene, 2018; Jansen *et al.,* 2017; Saquib *et al.,* 2016; Black and Billette, 2015; Morse and Driskell, 2009), our data showed no sex differences in the fast food intake pattern. That our sample was 78% female, however, may have rendered this null finding less reliable.

Frequent 'junk/fast food' (+ chicken and less-frequent fruit and veg) consumption pattern was strongly associated with lower restrained eating and higher uncontrolled eating. This finding agrees with previous studies that have linked emotional eating to with job stress (Okumus *et al.,* 2019) or uncontrolled eating to intake of high-energy-containing foods (Camilleri *et al.,* 2014) and implies that such individuals may be less able to change eating behaviour. The result, however, contradicts other studies that have found no association between eating traits and food intake (Brogan and Hevey, 2013; Adriaanse *et al.,* 2011; Anschutz *et al.,* 2009) suggesting that further research is required.

That more frequent consumption of beans/nuts was also associated with higher uncontrolled eating in the presence of burnout (exhaustion), suggests that some uncontrolled eaters target urges at healthier food, which could be a result of individual differences that moderate the relationship between burnout and eating and could explain inconsistencies in results between studies. Uncontrolled eaters may eat more regardless of healthiness. There may have been an interaction amongst eating behaviour traits, whereby level of Cognitive Restraint may have affected the expression of Uncontrolled

Eating (Bryant *et al.,* 2010). Where there is high Uncontrolled Eating with high Cognitive Restraint, a more disturbed eating style can develop with overeating of less healthy foods. Those with low Cognitive Restraint and high Uncontrolled Eating, however, may overeat all food, healthy or otherwise.

Among limitations inherent in this study is that the workplace context may have rendered work-related matters salient and biased responses toward burnout (Schaufeli *et al.,* 2009). The sample, although adequate for an exploratory study, was small and biased toward females. Although all are contracted to a 37-hour working week, academics can work longer. Future research on larger and more representative samples, therefore, should be conducted in order for findings to be generalised to other higher education employees. Future research may compare burnout and food intake between academics and administrative staff and different job roles as well as between full and part-time workers and taking the wider context into account.

The FFQ will have contained inaccuracies common to any self-reported, recall approach to dietary assessment (MacDiarmid and Blundell, 1998). The FFQ used in the current study did not distinguish between fresh and processed foods which would have strengthened extraction of the dietary patterns. Given previous studies have reported overeating in response to burnout (Armenta-Hernandez *et al.,* 2018; Mikalauskas *et al.,* 2018; Warren *et al.,* 2013), it would have been useful to have assessed portion size and included anthropometric measures. That the FFQ covered a reference period of three months, rendered it difficult to assess portion size, however, this is not a problem given the focus of the current study was on dietary quality not quantity. A strength of the current analysis is that unlike previous studies of burnout and eating (Okumus *et al.*,

2019; Alexandrova-Karamanova *et al.,* 2016; Kristanto *et al.,* 2016; Nevanpera *et al.,* 2012), the present study measured intake and has analysed dietary patterns.

Another omission given previous research which has found associations between burnout and higher alcohol intake (Mikalauskas *et al.,* 2018; Alexandrova-Karamanova *et al.,* 2016; Cecil *et al.,* 2016; Gorter *et al.,* 2000; Nowack and Pentkowski, 1994), is that the questionnaire did not enquire of alcohol intake. Assessment of physical activity may also have strengthened the models.

Like much research into occupational wellbeing (Lesener *et al.,* 2019), our study has been cross-sectional, meaning further research on larger samples comprising a range of job roles is required to ascertain direction of causation between burnout, eating traits and food choice. Meanwhile, these results suggest that different types of burnout (Emotional Exhaustion and Depersonalisation) and eating behaviour traits (Uncontrolled Eating and Cognitive Restraint) are differentially associated with junk/fast food consumption. These results have implications on workplace wellbeing interventions to promote healthier food choices.

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Table 1.

Component Loadings for Principle Components Analysis for Dietary Patterns with Varimax Rotation

	Components			
FFQ	1. Junk/Fast food	2. Meat/Fish	3. Grains/Dairy	4. Beans/Nuts
Dairy	.04	.03	**.62**	.00
Fruit	**-.58**	-.15	.11	.30
Chicken	**.56**	.41	.07	-.07
F/Veg	**-.76**	-.03	.10	.25
Legumes	**-.63**	.17	.20	.17
Beans	-.16	.22	.14	**.65**
Nuts	-.05	.11	-.13	**.72**
Fish	.04	**.74**	.13	.17
Pork	-.01	**.80**	.06	.02
Beef	.12	**.83**	.13	.09
Other Meat	.17	**.72**	.07	.04
Grains	-.05	.09	**.76**	.21
Eggs	.30	.33	.48	.29
Bread	.26	.09	**.71**	-.05
Sweets	.48	-.21	.31	.43
Snacks	**.67**	-.02	.31	.20
Soft Drinks	**.54**	.19	.16	.07
Coffee/Tea	-.31	.19	**.68**	-.16
Fast/Food	**.63**	.36	.11	.17

Note. $N = 109$. Loadings > |.50| are in boldface. FFQ = Food Frequency Questionnaire. F/Veg = Fruit/Vegetables.

Table 2.

Summary of Intercorrelations, Means, and Standard Deviations for Scores on Burnout and Eating Behaviour Traits

	1	2	3	4	5	6	*M*	*SD*
1. Emotional Exhaustion	--	.59***	-.14	.01	.28**	.30**	19.9	11.8
2. Depersonalisation		--	-.18	-.06	.36***	.14	6.5	6.2
3. Personal Accomplishment			--	-.10	.03	-.06	32.7	9.2
4. Cognitive Restraint				--	-.03	.25*	41.8	23.0
5. Uncontrolled Eating					--	.48***	37.7	22.0
6. Emotional Eating						--	36.4	28.7

Note. $N = 109$. * $p < .5$. ** $p < .01$. *** $p < .001$.

Table 3.

Multiple Regression Analyses: Associations between Gender, Age, Burnout (MBI), Eating Traits, and Dietary Pattern

	Dietary patterns			
	Junk/Fast food	Meat/Fish	Dairy/Grains	Beans/Nuts
Variables	*B*	*B*	*B*	*B*
Intercept	.813	-.320	.202	-1.403*
Age	-.001	.009	.003	.006
Gender	-.381	-.665*	-.671*	-.443
MBI-EE	-.024*	.009	.004	.027*
MBI-DP	.049*	-.011	-.024	-.032
MBI-PA	-.001	.015	.002	.013
TFEQ-CR	-.012**	-.002	.005	.005
TFEQ-UE	.014**	.001	.003	.015*
TFEQ-EE	.002	-.001	-.002	-.002
R^2	.44	.12	.09	.22
Adjusted R^2	.38	.03	-.001	.14
F	7.597***	1.28	.987	2.697*

Note. $N = 86$. Gender was dummy-coded (Men = 0 and Women = 1). MBI = Maslach Burnout Inventory. TFEQ = Three Factor Eating Questionnaire. EE = Emotional Exhaustion. DP = Depersonalisation. PA = Personal Accomplishment. CR = Cognitive Restraint. UE = Uncontrolled Eating. EE = Emotional Eating.

* $p < .05$. ** $p < .01$. *** p .001.