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Relationship between work-family conflict and unhealthy eating: Does eating style matter?

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Abstract

There is increasing evidence to suggest that work–family conflict is implicated in poor eating patterns. Yet, the underlying mechanism remains unexplored. The objectives of the present study were to demonstrate the interplay between work–family conflict, eating style, and unhealthy eating, and to test whether body mass index (BMI) and its interactions further explicate the relationships. In this study, 586 Malaysian adults (normal weight n = 437, overweight n = 149) completed a questionnaire, which included demographic variables, work–family scales, eating style measures, namely, restrained, emotional or external eating and reported food intake. As hypothesized, results showed that family-to-work conflict (FWC), emotional eating and external eating were positively related to unhealthy food consumption. In addition, emotional eating was found to moderate the impact of FCW on eating. These findings are consistent with research that has revealed emotional eating can indeed increase the positive association between stress such as conflict and unhealthy food choices. However, we found no clear support for the interactive effects of BMI. Our research builds on the findings of existing research as it demonstrates the role of eating style in explaining the association between work–family conflict and unhealthy eating. This conclusion has potential implications for appropriate interventions and calls for the enhancement of various policies to tackle obesity and other health problems.

Keywords: work–family conflict, eating style, unhealthy eating, body mass index (BMI)

Introduction

Epidemiological studies (Ng et al., 2014; NCD Risk Factor Collaboration, 2016) have identified obesity as among the most serious health challenges worldwide. While obesity has been viewed as a multifactorial disease (Morris et al., 2015), evidence suggests that the rise of the obesity pandemic is the result of lifestyles changes rather than genetic influences (Swinburn, Sacks, & Rvussin, 2009). For this reason, research on stress-induced eating (Greeno & Wing, 1994; Torres & Nowson, 2007) has received significant attention and has been used to explain obesity.

In recent years, people have shown a tendency to be concerned about work–family conflict as an important source of stress because of the changing natures of workplace and family patterns (O'Driscoll, Brough, & Kalliath, 2004). Work–family conflict 'represents a source of stress at the interface of work and family life, in that it reflects a lack of overall fit between work and family life' (Frone, 2000, p.888). The conceptualization of work–family conflict, rooted in the scarcity hypothesis (Marks, 1977), assumes that participating in multiple roles will inevitably drain substantial time and energy resources and accordingly, cause strain symptoms (Greenhaus & Beutell, 1985). Within this perspective, increasing indulgence in a less healthy diet, for example, may help to alleviate psychological arousal such as anxiety and irritability that result from role conflicts and help regulate mood state, at least temporarily (Umberson, Liu, & Rezcek, 2008). Across the variety of measures utilized

to assess eating, specifically, the amounts eaten and the types of food consumed, existing research (Allen & Armstrong, 2006; Lallukka et al., 2010; Roos, Sarlio-Lahteenkorva, Lallukka, & Lahelma, 2007) has suggested that overall work–family conflict has a significant direct impact on eating. Studies have also provided evidence that the specific directions of the conflicts; work-to-family conflict (WFC; the extent to which work interferes with family life) and family-to-work conflict (FWC; the extent to which family life interferes with work (Frone, Russell, & Cooper, 1992), have been associated with poor dietary patterns. However, studies have not always been consistent with regard to the direction of the conflicts. For example, Allen and Armstrong (2006) found that FWC was associated with eating more high fat foods while WFC was associated with eating less healthy food. Roos et al. (2007) found that women with strong WFC were more likely to follow recommended food habits while those who reported more FWC were less likely to report following recommended food habits. Because of this lack of clarity, it is of interest to investigate bidirectional interference, namely, both WFC and FWC on unhealthy dietary patterns. It is of particular concern that other health behaviour studies found that FWC, not WFC, was related to physical inactivity (Allen & Armstrong, 2006; Roos et al., 2007) and increased smoking (Nelson, Li, Sorenson, & Berkman, 2012).

While there is increasing evidence to suggest that work–family conflict is implicated in poor eating patterns, the underlying mechanism remains unexplored. With the assumption

that not everyone is inclined to change his or her eating behaviour during a stressful situation (Baicom & Aiken, 1981), a number of studies have proposed the role of eating style to explain the link between stress and eating. Currently, this issue has not been addressed in work–family conflict research. The aim of the present study was to extend the previous studies, primarily by exploring the potential influence of eating style to understand the relationships between work–family conflict and unhealthy eating.

Three common psychological types of eating style that have been widely assessed in the stress-eating domain are restrained eating, emotional eating and external eating (van Strien et al. 1986). Emotional eating refers to the tendency to eat when anxious or emotionally aroused by negative emotions such as stress, depression, loneliness, and anger. External eating describes those people who are more sensitive to external food cues than others and eat in response to those stimuli regardless of their state of hunger. Finally, restrained eating refers to the eating style characterized by conscious determination and efforts to restrict food intake and calories in order to control body weight through a self-control process.

A key developing area of research is concerned with whether eating styles affect the eating of particular types of food to explain their effect on health through the consumption of either a healthy or unhealthy diet. In particular, studies have observed the association of both emotional eating and external eating with unhealthy eating patterns including eating candy and sweet soft drinks (Elfhag & Morey, 2008; Elfhag, Tynelius, & Rasmusse, 2007),

unhealthy snacks (Snoek, van Strien, Janssens, & Engels, 2007) and comfort foods (Macht, 2008). On the other hand, previous literature has provided evidence of the mixed effects of restrained eating. In particular, several studies have found the beneficial effect of restrained eating in that it has been associated with healthier food choices (Elfhag & Morey, 2008) including the intake of fruit and vegetables (Elfhag, Tholin, & Rasmussen, 2008) and fewer snacks (Snoek et al., 2007). Other studies have found an unhealthy pattern indicating that restrained eaters are more likely to consume more fat and fatty foods (Habhab, Sheldon, & Loed, 2009) and show a greater hyperphagic response (Wardle, Steptoe, Oliver, Lipsey, 2000) and increased snacking (Roemich, Wright, & Eipstein, 2002) than unrestrained eaters. In a large nationally representative sample of UK adults, Olea López and Johnson (2016) found that restrained eating was associated with a smaller intake and slightly more frequent eating, but not snack frequency.

Furthermore, it has been proposed that the effect of stress on eating may operate through different mechanisms for emotional, external, and restrained eaters. Emotional eating is explained by the Psychosomatic Model (Kaplan & Kaplan, 1957), which proposed eating as a maladaptive coping method to reduce stress; this usually predisposes a person to comfort foods whose consumption evokes a psychologically comfortable and pleasurable state (Wansink, Cheney, & Chan, 2003). Support for the model was obtained from a few studies (O'Connor, Jones, Conner, McMillan, & Ferguson, 2008; Oliver et al., 2000; van Strien et al.,

2012; Wallis & Hetherington, 2009), which found that emotional eating significantly moderated the relation between distress and eating. In general, research of this kind has found that a negative influence of stress on eating patterns among vulnerable emotional eaters exists.

With regards to external eating, Heatherton and Baumester (1991) argued that stress causes changes in attentional bias towards the environment, in other words, it increases awareness about the presence of comfort food, among external eaters in order to shift attention from an unpleasant emotional state. A daily study (Conner, Fitter, & Fletcher, 1999), for instance, showed that more hassles were related to increase snacking behaviour only in those high on external eating, while no effect was found in those low on external eating.

In line with Restraint theory (Herman & Polivy, 1975), it is generally found that stress produces devastating effects among restrained eaters (Adam & Epel, 2007). Many of the earlier studies assumed stress disrupts self-control processes and subsequently, results in counter-regulatory eating (Conner et al., 1999; Herman & Polivy, 1975; Polivy & Herman, 1985). Research has found significant roles for restrained eating (Wallis & Hetherington, 2004, Wardle et al., 2000) in stress-eating relations. For instance, in both cross-sectional and longitudinal designs, Wardle et al. (2000) found a significant moderating effect of restrained eating, with a hyperphagic response to work stress in restrained eaters, compared with no effect in unrestrained eaters. However, a further laboratory study (Habhab et al., 2009)

reported no interaction between stress and restraint level in relation to food preferences.

Previous studies have been criticized for relying on laboratory methods (Habhab et al., 2009; van Strien et al., 2012) from which it is difficult to discern the extent to which such stressors are generalizable to everyday stress (O' Connor & Conner, 2011) including work–family conflict. One of the few non-laboratory studies by Wardle et al. (2000) advised that prolonged or frequent stress could result in adverse dietary changes. In particular, findings have advocated that chronic stress such as work–family conflict could result in increased cortisol (Goldstein, Shapiro, Chicz-DeMet, & Guthrie, 1999), which increases the tendency to consume hedonic, energy-dense foods and potentially lead to weight gain (Torres & Nowson, 2007). By building on these streams of research, the inclusion of three eating styles as potential moderators could help explain how work–family conflict influences dietary patterns.

Earlier reports predicted stress would be more likely to disrupt eating patterns in obese than lean individuals (Kaplan & Kaplan, 1957; Stunkard, 1959). However, several studies have focused on the relationship between stress and body mass index (BMI) and yielded inexplicable results. For instance, Kouvonen et al. (2005) reported a weak association between work stress and BMI among 45,810 employees, while a longitudinal study (Fowler-Brown et al., 2009) observed a prospective relationship between psychosocial stress and BMI change only among women. Torres and Nowson (2007) reviewed research

examining stress-induced eating in obese versus normal weight subjects and found that only one study of the five reported, demonstrated a significant increase in food intake in response to stress in obese individuals. While studies on the relationship between work–family conflict and BMI are limited, Grzywacz (2000) found that WFC was associated with obesity. In relation to eating style, research has generally indicated a significant relationship between emotional eating (Bailly et al., 2012; van Strien, Herman, & Verheijden, 2009), external eating (van Strien et al., 2009) and restrained eating (Lluch, Herbeth, Mejean, & Siest, 2000), and being overweight. Nevertheless, reverse effects have been found in other studies (Boschi, Iorio, Margiotta, D'Orsi, & Falconi, 2001; Snoek et al., 2007). The above findings highlight the further issue of the extent to which the relationship between work–family conflict and eating style varies across BMI level.

Of the research cited above, none focused on non-Western countries. While the prevalence of overweight and obesity has been reported to be lowest in Asian countries worldwide (Ng et al., 2014), studies (Wen et al., 2009) have indicated that Asian populations have different associations between BMI, percentage of body fat, and health risks than Western populations. In particular, Wen et al. (2009) found that overweight Asians showed an increase in all causes of mortality risk compared with overweight Caucasians. Malaysia has been categorized as a successful developing country characterized by a rapid phase of industrialization and urbanization. Accompanying this progression is a major change in

dietary pattern (Jamal et al., 2015), which in turn has led to a rising trend in major health problems. Statistics showed that Malaysia has the highest prevalence of obesity in the Asian region (Ng et al., 2014). In particular, while the Second National Health Morbidity Survey (NHMS II) reported a prevalence of 17% and 4% of adults being overweight and obese, respectively, in 1996 (Institute of Public Health, 1998), the NHMS report in 2015 reported an increase to 30% and 17.7%, respectively; the latter statistics indicate that one in two adult Malaysians are either overweight or obese (Institute of Public Health, 2015). Norris et al. (2014) stated that a stressful lifestyle resulting from social and economic changes has been identified as a pivotal barrier to healthier lifestyles among Malaysian adults. Working conditions in Malaysia are similar to those in Western countries in terms of high workloads, increased shiftwork and low payment rates. However, as opposed to westerners, Malaysian working organizations are often characterized by lack of initiatives to tackle work–life balance issues (Hassan & Dolard, 2007). Therefore, the objectives of the present study were to demonstrate the interplay between work–family conflict (WFC, FWC), eating style and unhealthy eating patterns, and possible interaction effects of BMI in a Malaysian sample. Based on the literature review outlined above, the following hypotheses were proposed.

Hypothesis 1: WFC and FWC are positively associated with unhealthy eating.

Hypothesis 2: Emotional eating and external eating are positively associated with unhealthy eating while restrained eating is negatively related to unhealthy eating.

Hypothesis 3: Eating style moderates the relationship between WFC and FWC on unhealthy eating.

Hypothesis 4: The relationship between eating style and unhealthy eating varies across BMI.

Hypothesis 5: BMI moderates the relationship between WFC and FWC, and eating style in relation to unhealthy eating, such that the effects are stronger in overweight samples compared with normal weight samples.

Materials and Methods

Participants and procedure

The demographic characteristics of the participants are reported in Table 1. The participants included 586 adults who volunteered to take part in the study; males = 230 (39.3%) and females = 356 (60.7 %). Convenience sampling was employed; the sample was recruited from multiple working organizations such as human services, industry, and medium- and small-sized businesses in the area of Kuala Terengganu, Malaysia. The distribution according to occupational sector was 75.2% public and 24.8 % private. The age of the sample ranged from 19 to 64 years (36.0 ± 10.2). The participants were recruited at their workplaces after informative meetings with representatives of the managements. They were informed about the purpose of the voluntary and confidential nature of participation.

Insert Table 1

Measures[1]

Work–family Conflict

Two directions of work–family conflict were assessed with a ten-item scale derived from Netemeyer, McMurrian, and Boles (1996). WFC was measured by 5 items; e.g. "The demands of my work interfere with my home and family life" and FWC by 5 items; e.g. "The demands of my family or spouse/partner interfere with work-related activities". α reliabilities were .90 for WFC and .91 for FWC. The participants responded to these items on 5-point scales; strongly disagree (1) to strongly agree (5). The work–family conflict measure has been translated and validated in another study using a Malaysian sample (Panatik et al., 2012), which revealed that both factors had high reliability (α = .96 for WFC scale and α = .95 for FWC scale).

Eating style

Eating style was measured with a short version of the Dutch Eating Behaviour Questionnaire (DEBQ, Bailly et al., 2012), which is frequently used for measuring psychological dimensions of eating behaviours in different countries (Elfhag et al., 2007). This measure consists of 16 items answered on a 5-point Likert scale, ranging from (1) never to (5) often; a

[1] All measures were in Malay language.

score for each scale is calculated as the sum of appropriate items. The measure represents three eating behaviour patterns: restrained eating (5 items), external eating (5 items), and emotional eating (6 items). The English version of DEBQ was translated into the Malay language. Back translation was conducted by two proficient linguists in both English and Malay. As part of the content validation procedure, consultation with experts to determine the representativeness, specificity and clarity of the questionnaire was used. The reliability of this translated measure is good, with $\alpha = .82$ for restrained eating, $\alpha = .90$ for emotional eating, and $\alpha = .81$ for external eating.

Unhealthy eating

There are particular types of food identified in the literature (e.g., O'Connor & Conner, 2011) that are implicated in obesity and health outcomes: more palatable or easily consumed foods such as processed and junk foods; foods with particular sensory or health characteristics like sweet foods and fried foods; and high energy foods consumed between meals, namely, snacking. The eating measure employed in the study was specifically developed to measure unhealthy eating and somewhat adapted from Groesz et al. (2012). Two experts in nutritional sciences reviewed the food group lists, which included foods typically consumed by Malaysian adults. The food items consisted of four food groupings: processed foods such as burgers, sausages and nuggets; junk food, for example, salty snacks, potato chips and instant noodles; fried food like fried rice, fried noodles and other fried Malaysian cuisine; and sweet

food, for instance, ice-cream, cakes, sugared traditional Malaysian dessert or kuih, sweets and chocolate. The participants were presented with these food categories and asked how many times they usually ate those types of food on a daily basis every week. Snacking frequency was measured by asking how often they snacked every day (Conner et al., 1999). The frequency scale had the following response format: less than 1 serving per day; 2–3 servings per day; 4–5 servings per day; and more than 6 servings per day. These options as were coded as 1, 2, 3, and 4, respectively. To compute an overall measure of unhealthy eating, each measure was standardized and a sum computed.

BMI

BMI was calculated from height and weight measurements. Participants with scores above 25 were considered overweight or obese (Cole et al, 2000). Because only a small number of participants were obese (n = 32), we grouped them with those classified as overweight in a single category. A total of 437 (74.6%) and 149 (25.4%) of the participants were classified as having normal weight and being overweight, respectively.

Statistical analyzes

Statistical analyses were performed by employing SPSS version 21.0. We first conducted Chi-square and t-tests to examine the differences in participants' characteristics (normal vs overweight). We then conducted bivariate correlation analyses to test the associations between variables. Multiple regressions were performed to examine the predictive effects of

predictor variables and interaction terms. Using a stepwise procedure, we entered the two-way interaction terms involving BMI x WFC or FWC; BMI x emotional or external or restrained eating; WFC or FWC x emotional or external or restrained eating and the three way-interactions involving BMI x WFC or FWC x emotional or external or restrained eating. It is important to note that only interactions that had significant betas for entry into the equation are reported.

Results

Descriptive statistics

In Table 1, the characteristics of the sample, scores on unhealthy eating and eating style split by BMI status are shown. In general, the respondents reported slightly higher WFC than FWC. In comparison to the normal weight sample, the overweight sample reported a slightly lower level of unhealthy eating (t (584) =1.16, n.s). In Table 2, the inter-correlations for all measures are displayed. Unhealthy eating was positively correlated with WFC, FWC, emotional eating and external eating. In relation to BMI status, only restrained eating was significantly correlated, indicating that the overweight sample had significantly higher scores for restrained eating compared to normal weight individuals, while no significant correlations were found for scores on emotional and external eating across all BMI groups[2].

[2]Because of the lack of difference in correlations for BMI as continuous vs. dichotomous measure, dichotomous measure in the regressions.

Insert Table 1 & 2 here

Regression analysis: Predictors of unhealthy eating

We conducted moderated hierarchical multiple regression analyzes to test the hypotheses (Table 3). The demographic background variables were entered in step 1. The demographic variables accounted for a statistically significant proportion of the variance, $R^2 = .03$; F (5, 578) = 4.13, p <.001. Child status emerged as a significant predictor in that those with children (M = .96, SD=4.24) were more likely to report an unhealthy dietary intake compared to those without children (M = .31, SD = 3.30). In step 2, we entered the main effects of the eating styles variables plus WFC and FWC. Their inclusion contributed to the unique variance explained in the outcome variable, $\Delta R^2 = .09$; F (5, 573) = 13.12, p < .001. FWC, emotional eating and external eating were significant predictors at this step. The results are partially consistent with Hypothesis 1 and Hypothesis 2. Stepwise method identified a significant interaction between FWC and emotional eating (β =.48, p <.001), accounting for significant incremental variance in eating ($\Delta R^2 = .03$; F (1, 552) = 17.43, p < .001), thus, providing support for Hypothesis 3. The significant increment in the amount of variance explained in unhealthy eating indicated that emotional eating significantly moderates the impact of FWC on unhealthy eating. In order to interpret the interaction, simple slope

analyses were performed using the procedures of Dawson (2014). As predicted, simple slope tests showed that FWC was a significant predictor of unhealthy eating for high levels of emotional eating (1 SD above the mean)(β =1.05, p <.001), but not for lower levels emotional eating (1 SD below the mean)(β = .11, n.s.). The moderation effect is depicted in Figure 1. It is worth noting that the other 2-way interactions and 3-way interactions did not enter into the equation, indicating that moderator-predictor interaction terms were all non-significant, thereby proving no support for moderating role of BMI on the relationships. Hence, hypothesis 4 and hypothesis 5 were not supported.

Insert Figure 1

Discussion

This is the first study to test the associations between work–family conflict, eating style, and unhealthy eating using a non-Western sample. We found a positive association between FWC and less healthy eating. Our findings point in a direction similar to that of other studies (Allen & Armstrong, 2006; Nelson et al., 2012; Roos et al., 2007), suggesting that FWC is a potent variable in explaining maladaptive outcomes including unhealthy eating, despite the fact that FWC was less commonly reported than WFC. As Allen and Armstrong (2006) noted, compared to WFC, FWC may elicit a greater stress-induced response that prompts

individuals to eat less healthy food as a comfort mechanism. While the psychological mechanisms behind the findings remain to be explored, other authors (Nelson et al., 2012) explained that it is plausible that dealing with FWC may involve experiencing greater emotional engagement (e.g. the burden of elder care, looking after sick children), as compared to WFC. The rationale is that such emotional demands are more likely to be disturbing (that is, provoke negative emotions) than work stressors, which in turn leads to individuals using more maladaptive coping mechanisms including unhealthy eating. Reports suggest that unhealthy food types are typically perceived as psychologically and physiologically rewarding (Ng & Jeffery, 2003), and offer inexpensive resources for short-term relief from discomfort that has resulted from stressful situations (Groesz et al., 2012). Furthermore, although there are some inconsistencies in the literature, research indicates that negative emotions such as anxiety, depression (Frone, 2000) and guilt (Livingston & Judge, 2008) bear stronger relationships to FWC than WFC. Future research should test this explanation to further elucidate whether specific emotional responses may be yet another factor accounting for the differences in the interaction between WFC and FWC on eating behaviour. Alternatively, because having higher conflict is linked to insufficient time, our results could also be partly explained by Malaysian cultural values, which view immediate and extended family as more salient (Hassan, Dollard, & Winefield (2010) compared to work-related issues. Consequently, with more family obligations needing to be

fulfilled, individuals may be less likely to take additional time to make sound dietary food choices. Taken together, the positive findings may be explained by the fact that the quality of most of the food items included in our study were hedonic, characterized as palatable, and easily purchased and prepared.

As hypothesized, our results found that individuals who scored high on emotional eating, reported a higher consumption of unhealthy food; this is in accordance with previous observations (De Lauzon et al., 2004; Elfhag et al., 2008; Konttinen, Mannisto, Sarlio-Lahteenkorva, Silventoinen, & Haukkala, 2010; Oliver et al., 2000; Snoek et al., 2007). Previous studies suggest that the associations of emotional eating with food consumption are stronger in relation to specific food choice (i.e. unhealthy food patterns) rather than the intake of nutrients (Konttinen et al., 2010). This is consistent with the notion that the palatability of the food content acts as a hedonic mechanism potentially to improve moods immediately (Macht & Muller, 2007; Macht, 2008) and/or temporarily shift attention away negative experiences (Heatherton & Baumeister, 1991). However, the interaction effect of BMI and emotional eating in relation to unhealthy eating was not confirmed in this study. This may suggest that there was a significant observation of the link between emotional eating and unhealthy eating regardless of body composition. This confirms reports (Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008) that have shown that emotional eating is not only an issue for overweight and obese individuals.

In agreement with Elfhag et al. (2008) and Kakoschke, Kemps, and Tiggemann (2017), our results also indicated that external eating was a significant predictor of unhealthy eating. The combination of great availability of unhealthy food that is cheaper and modern food marketing (Witkowski, 2007) in the environment might influence external eaters to consume these types of food as they are more susceptible to eating in response to external food cues (Elfhag et al. (2008). As noted by Khor (2012), Malaysia ranks among the top countries with regards to the availability of unhealthy food including sugar and sweeteners. Given this knowledge, intervention efforts should focus on implementing statutory regulations to restrict the marketing of unhealthy food. In the present study, there was no clear support for the moderating effect of BMI, suggesting that external eaters with both normal and overweight weight may be susceptible to unhealthy eating patterns. This supports the evolutionary adaptive response of external eating (van Strien et al., 2009) in that responsiveness to food cues may be a general characteristic and not specific to overweight people. Herman and Polivy (2008) postulated a distinction between normative cues, for example portion sizes, and sensory cues, for instance food palatability, to explain whether responsiveness to external food cues that affect eating may vary as a function of an individual's body weight. As such, examining the possible effects of these particular cues on eating may, therefore, be particularly important and worthy of further study.

Overall, whereas it was posited that emotional eating and external eating refer to

independent constructs (van Strien et al., 2016), in this study, the theory that negative emotional states and food cues could co-exist to elicit specific eating behaviours is supported (van Strien & Oosterveld, 2008). This may imply that individuals who experience stronger conflicts may eat a less healthy diet in response to emotional distress and at the same time, may also be more likely to consume an unhealthy diet because of their increasing awareness of external food cues.

This study hypothesized (hypothesis 3) that eating style moderates the effect of work–family conflict on unhealthy eating. We found that FWC leads to increased unhealthy eating in individuals in the high emotional eating group, whereas no effect was found in those in the lower group. Accumulating research has consistently found emotional eating has a moderating effect on stress-eating relationships (O'Connor et al., 2008; Oliver et al., 2000; van Strien et al., 2012; Wallis & Hetherington, 2009). While the underlying process of this moderation effect remains unclear, several possible mechanisms have been proposed. One such proposal focused on the activation of brain areas related to affective processes and food reward processes. An experimental study (Bohon, Stice, & Spoor, 2009) found that emotional eating was related to increased reward during negative mood. The findings suggest that emotional eaters find food more rewarding when they are in a state of negative mood compared to non-emotional eaters. Other evidence suggests that coping style may play a role in this regard. For example, Spoor, Bekker, van Strien, and Van Heck (2007) found that

particular coping strategies, namely, emotional-oriented and avoidance distraction were related to emotional eating. If particular maladaptive coping styles are found to underlie emotional eating, one could argue that emotional eaters may have fewer emotional-regulation strategies to regulate negative emotions (Spoor et al., 2007) in comparison to non-emotional eaters. We found no evidence of an interaction effect of WFC or FWC and eating style as a function of BMI. It would be of interest to find out, in further longitudinal research, whether the moderating effects of FWC could contribute to subsequent weight gain and other health risks including diabetes, cardiovascular diseases and life expectancy.

As noted previously, our study is in accordance with previous research (Lluch et al., 2000; Snoek et al., 2007) that demonstrated the links between weight status and restrained eating. However, it should be noted that due to the cross-sectional nature of the present study, the positive relationship between restrained eating and being overweight is not necessarily causal. Furthermore, we found no evidence for main and interaction effects of restrained eating in relation to unhealthy eating. Lowe and Kral (2006) argued restrained eating is the consequence of an array of behavioural and physiological factors rather than a cause that precipitates behaviour such as unhealthy eating and therefore, may be considered to be a proxy risk factor for weight gain and obesity. As such, additional prospective research is needed to investigate the salient factors and underlying mechanisms to account for the negative outcomes of restrained eating on weight trajectory (Schaumberg, Anderson,

Anderson, Reilly, & Gorrell, 2016). In addition, the pattern of the findings could be partly attributable to the construct, restrained eating. In particular, a number of researchers (Duarte et al., 2017; Westenhoefer, 1991) stated that dietary restraint is a complex construct that is multi-faceted. There has been some variation in how the construct has been operationalized and measured in literature on eating (Burton, Smit, & Lightowler, 2007), ranging from cognitive restraint or intention to restrict intake, fasting/skipping meals to flexible dietary restraint or eating certain foods in limited amounts (Schaumberg et al., 2016). Accordingly, such conceptualizations, in turn, might be expected to influence a variety of eating outcomes. In a recent review, Schaumberg et al., (2016) expressed the opinion that, depending on contexts and conceptualizations, restrained eating may have either healthy, for example, successful weight management or damaging, for instance, eating pathology risk implications. Taking into account the conflicting findings in dietary restraint literature, it is evident more research is needed to draw firm conclusions about the effects of restrained eating.

The limitations of this study should be noted. Firstly, the measurement of food intake comprised of a relative small number of unhealthy food items and did not take account of nutritional content. Such limitations prevent us from drawing conclusion about nutrient intake and ascertaining the extent to which the psycho-physiological responses to stress (i.e. higher conflicts) result in changes in food choices (Devonport, Nicholls & Fullerton, 2017; Epel, Lapidus, McEwen, & Brownell, 2001; Groesz et al., 2012) from more to less healthy food.

Future research should include a broader range of food lists (i.e. healthier food choice) and use more detailed and precise dietary assessment. Secondly, this study was cross-sectional; therefore, no causal inferences can be drawn from the results. In addition, sampling bias, due to the nature of the non-probability sampling technique, may limit the generalizability of the findings. It may be beneficial for future studies to use larger scale, representative sampling procedures with more diverse populations. Finally, given that stress-induced eating is associated with physiological changes such as cortisol secretion (Torres & Nowson, 2007) future research should integrate physiological measurements of stress such as cortisol levels and blood pressure with the evaluations of changes in eating measures (Poms, Fleming & Jacobson, 2016).

Conclusions

Clearly, our research builds on existing literature as it revealed the role of eating style in explaining the association between work–family conflict and unhealthy eating. Our findings, thus, suggest that more attention should be paid to establishing employers' family-supportive policies to promote healthier lifestyles, and address the prevention and treatment of obesity. It also calls for the enhancement of various policies aimed at reducing work–family stress as well as promoting a healthy nutritional environment. Secondly, targeting emotional eating may offer appropriate targets to design family–work related interventions. Given that emotional eating is a learned behaviour employed to reduce a negative state (Kaplan &

Kaplan, 1957), understanding the earliest origins of emotional eating (Levitan & Davis, 2010) and developing appropriate interventions, which focus on teaching techniques to reduce emotional eating such as adaptive coping strategies, emotion regulation skills (Roosen, Safer, Adler, Cebolla, & van Strien, 2012) and mindfulness training (van Strien et al., 2016) are priorities in this regard.

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Table 1

Sample characteristics

	Total sample	Normal weight sample	Overweight sample
Gender- N (%)	586	437 (74.6)	149 (25.4)
Males	230	160 (69.6)	70 (30.4)
Females	356	277 (77.8)	79(22.2)
Age N (%)			
19-30	360	291 (80.8)	69 (19.2)
31-64	226	146 (64.6)	80 (35.4)
Marital status N (%)			
Single	143	120 (83.9)	23 (16.1)
Married	443	317 (71.6)	126 (28.4)
Income N (%)			
Less than RM3499	388	301 (52.9)	87 (15.3)
RM 3500 or more	181	125 (22.0)	56 (9.8)
Children N (%)			
No children	319	241 (75.5)	78 (24.5)

With children	267	196 (73.4)	71 (26.6)
Snacking- mean (SD)	1.27 (.52)	1.29 (.54)	1.20 (.46)
Processed food- mean (SD)[a]	1.19 (.52)	1.22 (.55)	1.11 (.37)
Junk food- mean (SD)	1.21 (.53)	1.22 (.57)	1.15 (.41)
Fried food- mean (SD)	1.44 (.60)	1.46 (.62)	1.38 (.51)
Sweet food- mean (SD)	1.37 (.59)	1.37 (.61)	1.37 (.53)
Unhealthy eating- mean (SD)[b]	0.00	0.10 (3.80)	-0.29 (2.88)
Emotional eating- mean (SD)	2.18 (0.87)	2.16 (0.85)	2.23 (0.92)
External eating- mean (SD)	2.83 (0.71)	2.82 (0.73)	2.86 (0.66)
Restrained eating- mean (SD)[c]	3.02 (0.78)	2.96 (0.79)	3.20 (0.76)
WFC- mean (SD)	12.87 (4.25)	12.7 (4.24)	13.21 (4.27)
FWC- mean (SD)	11.53 (3.43)	11.53 (3.37)	11.53 (3.63)

[a]Significant difference between normal weight and overweight samples ($t(584) = 2.24$, $p<.05$); [b]Note that the eating index was reported in a z-score. [c]Significant difference between normal weight and overweight samples ($t(584) = -3.11$, $p<.01$.

Table 2

Intercorrelations among variables

variable	1	2	3	4	5	6	7
1.Unhealthy Eating	-						
2.WFC	.16**	-					
3.FWC	.21**	.56**	-				
4.Restrained	-.03	.10*	.04	-			
5.Emotional	.24**	.13**	.11*	.12**	-		
6.External	.19**	.14**	.11*	-.09*	.35**	-	
7.BMI[a]	-.06	.03	-.02	.15**	.04	-.02	-
8.BMI[b]	-.05	.04	.00	.13**	.03	.02	-

*p<.05.**p<.01.***p<.001; [a]continuous variable; [b]0 = normal weight, 1= overweight; WFC = work-to-family conflict, FWC = family-to-work conflict, FWC

Table 3

Hierarchical regression of unhealthy eating on demographic, eating style and WFC, FWC

	Step 1	**Step 2**	**Step 3**		
	β	***β***	***β***	**ΔR^2**	**Δ F**
Step 1: Control variables				.03	**4.13*** **
Gender	-.13	-.19	-.20		
Age	-.47	-.46	-.55		
Marital status	-.56	-.22	-.19		
Child	**-.80***	**-.98****	**-.98****		
BMI	-.22	-.34	-.24		
Step 2 Main effects of predictors				.09	**13.12*** **
Restrained		-.03	-.02		
Emotional		**.66*** **	**.62*** **		
External		**.32***	**.34***		
WFC		.14	.14		
FWC		**.57****	**.50****		
Step3 Interaction effects				.03	**17.43*** **
FWC x Emotional			**.48*** **		

*p<.05.**p<.01.***p<.001, WFC = work-to-family conflict, FWC = family-to-work conflict,

FWC

Fig. 1. Regression lines for relationship between FWC and unhealthy eating as moderated by emotional eating (low, high).