The Influence of Office Employees' Eating Behaviour Due to Stress: The Case of Universiti Malaysia Sabah Office Employees

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ARTICLE INFO	ABSTRACT
	It is common for stressful people to seek relief through eating their favourite foods or comfort foods. However, these foods can be unhealthy if taken too frequently. The study focuses on determining the university office employees' choice of comfort foods and investigating the influence of stress on their eating behaviours. Among all of Universiti Malaysia Sabah office employees, 337 were selected through stratified sampling. Self-administered questionnaires were used to collect data. Descriptive and one-way ANOVA analysis were used. Findings showed most respondents were within medium level of stress. Based on the findings of IES, the differences on stress levels on respondents' comfort food intake were significant ($F_{(2, 334)} = 8.71$, p lower than 0.05). However, respondents are found to enjoy consuming comfort foods regardless of stress levels and will choose comfort foods to satisfy hunger. This highlights the importance of diet intervention to be included as a component in stress management as to aid the prevention of diet-related diseases among the university office employees.

I. Introduction

Besides as sustenance, food is also regarded as a common source of comfort, relief and even as a reward (Dalton et.al, 2013; Sublette & Martin, 2016). The simple act of consuming familiar foods influences the emotional state of a person such as providing the sense of security, calmness and nostalgia. In the perspective of science, specific chemical components in foods effect on the release of hormones in the human body and influence on the person's mood. Foods with dark chocolate able to increase the production of serotonin, a hormone that elevates the feeling of happiness and content (Locher et.al, 2005; Mannur, 2007).

Occupational stress has become an issue as it is seen as a negative outcome on labour health and mental problems, organization productivity and country's economy (Bruce, 2016). Work hours have become longer in Asian countries due to the challenges and rapid development in the post globalization and postindustrial era (Klatzkin et.al, 2018). This pushes most Asian employees to extend their work hours in order to keep up with the increase workload and current organization goals.

It is natural for stressful individuals to seek instant satisfaction and alleviation through the consumption of their comfort foods (Sublette & Martin, 2016). However, reference (Scaccia, 2017) added that stress able to increase food intake and alter a person's food choices. Most of comfort foods are known to be unhealthy and high in calories. According to reference (Camilleri, 2017), comfort foods are commonly in the categories of junk foods, convenient foods, sugary and oily foods. Comfort foods come into existence in America in 1977 as foods that fulfil the human emotional needs (Mackenbach, 2019). Comfort food vary around the world and it is influenced by the cultures exist in a country (Bucher, 2016). Therefore, foods that are regarded to be comforting in the Western countries may not be the same in Asia. For instance, it is mentioned that Miso soup

is preferred by Japanese as comfort food whereas the Americans are more towards burgers and meat pies (Bucher, 2016). There are four categories of comfort foods, which are nostalgia foods, indulgence foods, convenience foods and physical comfort foods.

Aside for emotional relieve, comfort foods also trigger nostalgia through familiarity and have positive meaning and memory (Hamburg, 2014). It is commonly related to the reminiscence of ones' childhood or an eventful experience in the eater's life. Nostalgia foods are comfort foods that evoke the memory of happiness from the eater's past experiences through sensory inputs (taste, sound, touch and smell) (Troisi & Gabriel, 2011; Gibbons, 2019). Reference (Suzuki, 2016) added most nostalgic foods are sweet foods like cakes, candies, cookies and jams, whereas traditional and heritage foods are also included in this category as it associates the eater with his or her home country, festivities, family and ethnic backgrounds (Mannur, 2017; Nordin & Ahin, 2016).

Indulgence foods are foods that people crave for and high in calories, fat and sugar (Troisi & Gabriel, 2011; Jones & Long, 2017). This food is usually consumed to soothe emotional distress by giving the person a sense of self-rewarding and pleasure (Soffin & Batsell, 2019). The element of convenience has become one of the main factors in influencing consumers' food choice. Convenience foods are food products which easy to prepare, cook or eaten instantly, and easy access foods (Spence, 2017; Omar & Omar, 2018; Cohen & Williamson, 1988). Despite of its advantages in preparation, convenience food is deemed unhealthy as it contains high sugar, salt, fats and artificial additives. Tylka and Kroon (2013) stated that low and middle-income families tend to purchase convenience foods because the foods require less preparation time with taste that is well-received among children. Besides differences of income class, age is also a significant determinant in preferences of convenience foods. Younger consumers choose these products as meal replacements meanwhile older consumers prefer it as a diet replacement (Tylka & Kroon, 2013).

Physical comfort foods provide physical relieve or satisfaction to the consumer through sensory stimulation like sound, touch, taste and smell. Troisi and Gabriel (2011) defines physical comfort as foods that bring comfort via the foods' physical properties or changes on physical properties which the foods provide to the consumer. The temperature of food, textures, digestibility and flavours are factors contribute to physical comfort of foods. Despite the need of a nutritious and balance diet, individuals under stress tend to choose less nutritious comforting foods to eat (Locher et.al, 2005). The chemical changes trigger by stress increase the intake of both fatty and sugary foods as to dampen the body responses to flight or fight. Parveen (2016) has grouped eating behavior into three categories which are emotional, external and binge eating, flexible and rigid control eating behaviour, eating self-efficacy. The two of these dimensions are associated closely to the psychopathological distress, and these are controlled food consumption and emotional and binge-eating.

According to Rahkovsky and Snyder (2015) people who are aware of their negative emotions tend to allow themselves to indulge on unhealthy but tasty foods. Therefore, prolong state of stress and emotional distress has the potential to lead to various health problems like obesity, diabetes and cardiovascular diseases, due to lack of self-control on eating indulgence foods (Poínhos, 2018). However, Troisi and Gabriel (2011) has argued that not all comfort foods are unhealthy. Nostalgia foods include home cooked and traditional foods which are healthier options than foods in indulgence and convenience comfort food categories. These negative emotions are referred to social and emotional distress, and stress. Office jobs are also seen as a sedentary activity as it involves less strenuous movements and prolong sitting position. Therefore, it increases the risk of diet-related and non-infectious diseases such as obesity, cardiovascular disease and diabetes. This study aims to investigate the influence of stress on office employees' food choices and to investigate their eating behaviour during stress.

II. Method

This study wants to investigate the preferences of comfort foods and the eating habits under the influence of stress among office employees. Quantitative method was used to obtain the required information for this study. The study's target population was the administrative employees who are currently working in Universiti Malaysia Sabah. These employees are from 52 general offices which include all the main campus's faculties, research institutes, units and departments. A total of 337 respondents had been chosen through stratified sampling method.

Self-administered questionnaire was distributed to the respondents. Both English and Malay language were used in the construction of the questionnaire. Vignolles and Pichon (2014) is adapted in constructing the study's instrument. The first section is focused on the respondents' demography information. The second section is to determine the food choice under stress by using four categories of comfort food; Nostalgic food, Indulgence food, Convenience food and Physical comfort food (Troisi & Gabriel, 2011; Patterson & Goodfriend, 2009). A 5-point Likert scale is used to measure the respondents' response (1= very unlikely to 5= very likely). The addition of modified *Intuitive Eating Scale* (IES-2) (Rogus, 2018) to determine eating habits and the *Perceived Stress Scale 10 item scale* (PSS-10) [38] to measure the respondents' current stress levels. The instrument is tested for its reliability and validity using Cronbach Alpha before distribution. Descriptive and one-way ANOVA analysis were used to analyse the collected data.

III. Results and Discussion

The respondent's demographic profile is analysed through frequency and descriptive analysis. Table 1 shows the results of the study's analysis. The respondents are mostly female (n=202, 59.9%) and as for male, there are 135 respondents (40.1%) participated this study. Majority of the respondents are within the age range of 31 to 40 years old (n=175, 51.9%). Respondents of the age range of 51 to 60 years old (n=8, 2.4%) represent the smallest number from the total participated respondents. The ethnicity of Bumiputera Sabah represents the majority from the respondents with 252 (74.8%) people and there are 8 respondents who are Chinese. Majority of the respondents have qualification level of SPM (n=121, 35.9%). Meanwhile, others own a diploma certification (n=105, 31.2%), whereas 107 respondents hold a degree certification (31.8%) and there are only 8 respondents have a master's degree (1.2%). Most of them are married (n=223, 66.2%). This is followed by 'Single' with 109 (32.3%) respondents and the 'Divorced' (n=5, 1.5%).

Table 1. Respondents demographic background

Demographic (n=337)	N	%
Gender		
Male	135	(40.1)
Female	202	(59.9)
Age		
18-30 years old	109	(32.3)
31-40 years old	175	(51.9)
41-50 years old	45	(13.4)
51-60 years old	8	(2.4)
Ethnicity		
Malay	79	(23.4)
Chinese	6	(1.8)
Bumiputera Sabah	252	(74.8)
Education Level		
SPM	121	35.9
Diploma	105	31.2
Bachelor	107	31.8
Master	4	1.2
Marital status		
Single	109	32.3
Married	223	66.2

Demographic (n=337)	N	%
Divorced	5	1.5

Based on result on *PSS-10* scale (refer Table 2), from 337 total participated population, 198 (58.8%) respondents were experiencing medium levels of stress and 121 (35.9%) of them experienced high stress levels. Female employees represented the most in moderate level with 126 people, whereas male employees with 72 people in the same level of stress.

Table 2. Respondents' stress levels

Stress level Gender	Low (n)	Moderate (n)	High (n)	Total (n)
Male	10	72	53	135
Female	18	126	68	202
Total n	**28**	**198**	**121**	**337**

Female employees, especially working mothers, tend to experience higher level of stress as they must juggle between work-related pressure as well as receiving less gain support in managing stress from their organization (Kate, 2017). The current global challenges and increase workload have also contributed to the increase levels of stress among women. With the expanding numbers of dual income families, women have to divide their time to taking care of their own families as well as managing long working hours in their organization at the same time.

A. *Respondents' comfort food of choice during stress*

Four comfort foods categories are analysed by using descriptive analysis. Based on Table 2, 'Physical comfort foods' has the highest overall mean of 3.52 (*SD*= 1.14). This is followed by 'Indulgence foods' (*M*=3.44, *SD*=1.17), 'Nostalgia foods' (*M*=3.36, *SD*= 1.22) and with the 'Convenience foods' being the lowest (*M*=3.02, *SD*= 1.20).

In the 'Nostalgia foods' category, 'Home cooked food' scores the highest (*M*= 3.96, *SD*=1.17) and 'Homemade cookies' has the lowest mean score (*M*=2.96, *SD*= 1.30). As for 'Indulgence foods', the item 'Fried chicken' receives the highest mean score (*M*=3.75, *SD*=1.10). The item scores smallest mean value in the same category is 'Deep fried pastries' (*M*=3.17, *SD*=1.13). Item 'Instant noodles' receives the most likely product consume for comfort among the respondents with mean value 3.44 (*SD*=1.19) in the 'Convenience food' category. 'Canned food' gains the smallest score of mean value 2.79 (*SD*= 1.18). In 'Indulgence foods' category, item 'Ice cream/frozen dessert' scores slightly higher than item 'Soup dishes' with mean value of 3.86 (*SD*=1.10). Item 'Sweet/dessert porridges 'obtains the smallest with mean value of 3.10 (*SD*=1.19).

Table 3. Respondents' preference of comfort food

Types of Comfort food		Mean (M)	Standard deviation (SD)
Nostalgic foods			
1.	Home cooked food	3.96	1.17
2.	Homemade cookies	2.96	1.30
3.	Fritters/Beignets	3.08	1.22
4.	Toast with spread (Kaya and Butter)	3.26	1.26
5.	Traditional food	3.55	1.18
Overall Mean		3.36	1.22
Indulgence foods			
1.	Fried chicken	3.75	1.09
2.	Cakes	3.46	1.21
3.	Banana fritters	3.36	1.16
4.	Pastry and confectionary products with cheese	3.40	1.16
5.	Deep-fried pastries	3.17	1.13
6.	Foreign cuisine	3.34	1.31
7.	Fast food	3.62	1.12
Overall Mean		3.44	1.17

Types of Comfort food	Mean (M)	Standard deviation (SD)
Convenience foods		
1. Instant soup in packets	2.88	1.27
2. Frozen food	2.97	1.15
3. Canned food	2.79	1.19
4. Instant noodles	3.44	1.19
Overall Mean	3.02	1.20
Physical comfort foods		
1. Soup dishes (Noodle soup/Soto/Laksa)	3.85	1.05
2. Ice cream/Frozen desserts	3.86	1.10
3. Pudding/Jelly	3.42	1.22
4. Sweet/dessert porridges	3.10	1.19
5. Curry	3.36	1.10
6. Nasi lemak with condiments	3.37	1.13
7. Cendol/Shaved ice (ABC)	3.66	1.20
Overall Mean	3.52	1.14

Home cooked and traditional foods can provide a sense of familiarity and security. Most of the respondents have family members who prepare food at home for them. As for traditional food, this food is prized as the nation identity, can be made from local staple ingredients, and is usually prepared as daily dishes (Nakano & Washizu, 2020). Therefore, the slight differences of its mean value to home cooked foods. Physical comfort food offers immediate relieve through tangible means such temperature, texture, mouthfeel and easy to digest. Cold desserts and warm foods are found comforting to respondents based on the study's findings. In correspondence to the country's humid and warm weather, frozen and cold desserts can bring relieve from heat discomfort and uplift a person's mood (Munichor & Friedlander, 2019). As for warm foods like soups and beverages, the warmth sensation felt through touch psychologically soothes emotional distress such as anxiety and loneliness (Sublette & Martin, 2016).

From Table 3, most respondents are inclined to instant noodles as a comfort food in the convenience food category. Malaysia is one of the countries in the world with the highest consumption of instant noodles (Hwang & Choe, 2016; Habib et.al, 2011). Instant noodles are easy to prepare, inexpensive, have wider variation and it is one of the most common pantry items in the Malaysian household. In the indulgence food category, most respondents have picked fried chicken and fast food to alleviate stress. Cardiff. (2013) mentioned that fried chicken is the most preferable fast-food item in Malaysia. With easy access to fast food chain restaurants and responsive food delivery services to respondents' current workplace, the cravings for both food items can be simply satisfied in any times of need.

B. *Employees' eating behaviour under stress*

By using the *Intuitive Eating Scale* (IES) and scores from the *PSS-10*, Table 4 shows the significance of stress levels on the employees' eating habits. Difference between *IES* and *PSS-10* scores is found to be significant with $F_{(2, 334)} = 8.71$ ($p=0.00$, $p<0.05$). Among all of the *IES* items, the one-way ANOVA analysis has shown two differences that significant which are 'Eating for physical rather than emotional response' with $F_{(2, 334)} = 90.20$ ($p=0.00$, $p<0.05$) and 'Reliance on hunger and satiety cues' with $F_{(2, 334)} = 5.79$ ($p=0.03$, $p<0.05$).

The significance *IES* score to *PSS-10* indicates that the employees' eating behaviour is influenced by their stress levels. However, there is contradiction to the findings in which respondents do not seek emotional comfort by consuming these foods. Eating their preferred comfort foods are seen as an enjoyment regardless of their stress levels. This eating behaviour is relevant to the items "reliance on hunger and satiety cues" and "unconditional permission to eat". These comfort foods as seen as a reward for the day's work, or as means of satisfying ones' hunger. It strongly stated that food environment plays a big influence on a person's food choice and this includes the food proximity to the consumer (Osman et.al, 2014; Boynton, 2016; Huberts et.al, 2012). Consumers tend to choose foods that are readily accessible from where they live or work in purpose of convenience. Therefore, if the foodscape or food environment is mostly dominated by

unhealthy foods, it is likely that consumers will buy and eating these foods. In this case, the easy accessibility to comfort food from work location, respondents are quickly to choose comfort foods to relief their hunger pangs. Besides accessibility, social and purchasing power also enable respondents to have their comfort foods regularly during work days. Food recommendation from peers are often taken seriously by office employees in selecting meals during breaks.

Table 4. One-way ANOVA analysis on respondents' stress levels towards *IES* results

Variables	Variation Source	Sum of Squares	df	Mean^2	F	Sig
IES Score	Between groups	1.71	2	0.86	8.71*	0.000
	Within groups	32.78	334	0.09		
	Total	34.49	336			
Eating for physical rather than emotional response	Between groups	0.068	2	0.034	0.12	0.89
	Within groups	94.32	334	0.28		
	Total	94.39	336			
Unconditional permission to eat	Between groups	34.39	2	17.20	90.20*	0.000
	Within groups	63.67	334	0.19		
	Total	98.06	336			
Reliance on hunger and satiety cues	Between groups	6.43	2	3.22	5.79*	0.003
	Within groups	185.70	334	0.56		
	Total	192.14	336			
Body food choice congruence	Between groups	3.817	2	1.91	2.88	0.058
	Within groups	221.48	334	0.66		
	Total	225.30	336			

* = Has significant difference

Body food choice congruence refers to the person's eating choices are based on the need to improve his or her body (Barrada et.al, 2018). This can be achieved through selecting and consuming healthy foods. With the study leans more to the item "unconditional eating", the insignificance of item "body food choice congruence" shows that most respondents do not restrict their eating habits and willing to indulge more on comfort foods. The dimension of "unconditional permission to eat" is commonly associated with the allowance to indulge unhealthy foods and this is the opposite of the dimension "body food choice congruence" (Khoo, 2019). In addition, the lack of restrain on consuming comfort foods may lead to potential serious non-infectious diseases like obesity, diabetes and hypertension (Singh, 2016).

The dimension "reliance hunger and satiety cues" are associated to the behaviour of consuming foods in order to satisfy the natural response to hunger and thirst rather eating and drinking to seek relief psychologically. The data shows that the respondents will respond to hunger and stop eating once they are satisfied in spite of their current stress levels. This is seen as a positive outlook as intuitive eating can help to curb binge eating and helps to lower the risks of non-infectious diseases (Singh, 2016). Nevertheless, the limitation of consumption varies from an individual to another as different people may have different levels of satiety. A person's hormonal, psychological and level of physical activity factors contribute to the baseline of hunger and sensation of fullness (Lee, 2016; Brown, 2016).

IV. Conclusion

In conclusion, the study's findings found that stress levels do influence on the university office employees eating behaviour. Seeking emotional and physical comfort from eating favourite foods considers as a natural and familiar way towards easy and instant gratification. The significance on the unconditional eating behaviour has the respondents feeling permitted to indulge without any guilt on comforting and yet, unhealthy foods in order to relieve stress. With the dynamic changes of education organizational goals, challenges and workloads, it is inevitable that all university office employees will experience high levels of work-related stress. Thus, high level of stress along with detrimental way of coping such as consuming high calorie comfort foods will lead to increase risks of serious illnesses among the employees. In order to intervene effectively, the human resource management is to provide proper stress management for both male and female employees, with the additional of nutrition education/intervention for all of its employees. Continuous intervention programs can help to lessen comfort eating behaviour, foster healthier lifestyle and increase employee productivity. Besides intervention programs, the food environment or foodscape is taken into one of the factors influence the employees' eating behaviour. Some of the preferred foods are traditional or local foods, which are prepared with rich ingredients, high in fat, sugar or salt, and with less servings of vegetables or fruits evidently poses problems of imbalance nutrition. The availability of healthier, nutritious and appealing meals can be done by providing easy access to these foods within the campus's grounds. There are several improvements that can be done in furthering of this study. The inclusion of income range of the respondents in the demography section can aid in further investigation on respondents' purchasing power as well as pinpoint preferences more clearly. A longitudinal method of study also helps to investigate the extent of the eating behaviour as the differences of stress level from the same respondents may provide more in-depth results on the findings. The respondents' body mass index (BMI) data can also provide further analysis on the outcome on eating behaviour especially on intuitive eating dimension as differences of satiety baseline are impacted from hormonal changes among overweight and normal weighted individuals.

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