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Abstract

This study is a cross-sectional study which was conducted to examine the effects of unhealthy food accessibility, healthy lifestyle and influencer marketing towards undergraduates' unhealthy diet in universities in Kelantan. By using quota sampling, a total of 372 students from three universities were approached, and each of the university was represented by different number of students, which was based on its percentage of representativeness in the population. Data was collected by using a set of self-administered questionnaire which was distributed online via google form. Regression analyses were conducted based on the genders and sources of study fund cross tabulation. The results from regression analyses have demonstrated that unhealthy food accessibility to have no effect on the unhealthy diet for male students, while healthy lifestyle variable will not influence the unhealthy diet for female students. In terms of the sources of study fund, only influencer marketing variable can significantly affect the unhealthy diet of students who were supported by family, while influencer marketing and unhealthy food accessibility variables were found to be the predictors of unhealthy for students who received loan or sponsorship. On the other hand, none of the independent variable can influence the unhealthy diet for self-funded students.

Therefore, several suggestions have been recommended for the respective undergraduates as well as for future researchers.

Keywords: Unhealthy Diet, Unhealthy Food Accessibility, Healthy Lifestyle, Influencer Marketing, Sources of Study Fund

Introduction

An unhealthy diet refers to an eating regimen that contains high in sugars, saturated and trans fats, low fibre food sources and high-sugar drinks add to non-communicable diseases (NCDs) and other medical issues (World Heart Federation, 2017). Unhealthy diet habits are one of the factors that may adversely affect weight gain of adults, continuous sickness, including cardiovascular diseases (CVDs), stunted growth, various conditions associated with weight, diabetes, skin inflammation, swelling and specific sorts of cancers (Hoque et al., 2018; Lama, 2018; Sogari et al., 2018; World Health Organization (WHO), 2021a). Eating specific kinds of fats, for instance, saturated fats found in margarine, cream and burger, can raise blood. Approximately 11 million deaths of all adults' deaths were contributed by dietary risk in 2018, in which CVD was the major cause for these diet-related deaths (Afshin et al., 2019). 17.9 million deaths each year are recorded due to the CVD (World Health Organization (WHO), 2021b). In the meantime, it was also reported that Southeast Asian countries have high statistics of obese individuals in the world as they have poor dietary patterns and lifestyles (Lee & Muda, 2019). An annual survey of National Health and Morbidity Survey (NHMS) by The Institute of Public Health Malaysia has reported 50.1% of Malaysian adults were either overweight or obese, encompassing 30.4% of overweight and 19.7% of obese (Institute for Public Health Malaysia, 2020). Research by Radzi et al (2019), stated that the insights of overweight and obesity among Malaysian college students were 21.2% and 16.3% respectively. They also discovered that overweight and obese students were largely represented by the bachelor students of 23% and 17.5% respectively. This is higher than the statistics shown in China of 2018 which indicated that the statistics of overweight and obesity among university students was 9.5% (Jiang et al., 2018).

Due to the recent pandemic which restricted the movement of Malaysians, they are now preferring to engage in unhealthy diet by consuming instant food as they are easy to access. This has garnered concerns among the medical practitioners and dietitian because there are insufficient micronutrients (vitamins and minerals) consumed, which may lead to increased NCDs. Benajiba (2016), stated that there was clear evident that adults have high fast-food intake especially university students, supported by Syafiqah et al (2018) who found that 93% of students are highly interested to consume fast-food. Based on a prominent Malaysian economist has mentioned that 20% of children in Malaysia are stunted, and the other 20% are either overweight or obese due to poor dietary habits (Chong, 2020). This problem is particularly worsened when the emergence of social media influencers takes place in inspiring users and consumers to do something new, for example by influencing the lifestyle of a community. According to Khalid et al (2018), the social media influencers may influence the behaviour, attitude and the dietary choices of the young adults. This is due to the fact that social media influencers are technically the internet's owner (McCorquodale, 2019) who can regulate what people watch, what they think and what they buy. This has justified the increasing trend of obesity and unhealthy food intake routine among Malaysians, demonstrating how crucial it is to understand an individual's diet to recommend a better resolution for the matter. With strong concern that obesity is increasing among young adults (Institute for Public Health, 2015), this study is intended to spread awareness among the

undergraduates in Kelantan to fully utilize the nutrition facts to decide and practice healthy diet. Hence, two objectives were highlighted for this research:

1. To examine which independent variable predict the undergraduates' unhealthy diet based on their genders.
2. To examine which independent variable predict the undergraduates' unhealthy diet based on their sources of study fund.

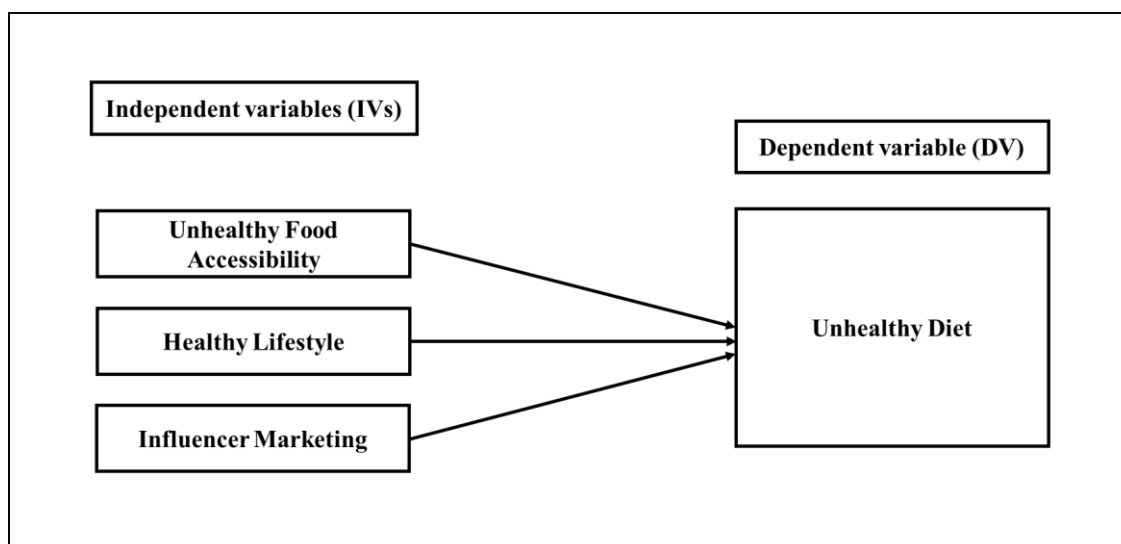


Figure 1: Conceptual Framework of Relationships between Unhealthy Food Accessibility, Healthy Lifestyle and Influencer Marketing towards Unhealthy Diet

Methodology

This quantitative research applied a cross-sectional study design as it intended to identify the relationship between unhealthy food accessibility, healthy lifestyle and influencer marketing towards unhealthy diet, comparing the undergraduates in Kelantan tertiary education institutions based on their demographic background. This research design will assist the researchers to measure the variable's relationships in a defined population (Wang & Cheng, 2020). UMK City Campus, UiTM Machang Campus and USM Kubang Kerian Campus were selected by the researchers as the population for this study, represented the three tertiary education institutions in Kelantan. The researchers used quota sampling whereby, the samples were selected based on the probability proportionate of the population's distribution (Rukmana, 2014). This has enabled the researchers to have a more generalizable result, representing the involved populations. In brief, this study has a total of 13,840 students as its population, comprised of 5639 students from UMK, 4000 students from UiTM and 2122 students from USM. According to Krejcie and Morgan (1970), the most appropriate sample size for this study was 372 undergraduates. Subsequently, the researchers decided on the quota for each university by conforming to its population representativeness. UMK has represented 48% of the population, thus 179 students were selected as the respondents. Meanwhile, 34% of population was represented by UiTM, hence 126 students were involved in this study. Lastly, 67 students of USM have represented its 18% representativeness of the whole population. Moreover, this study has applied a self-administered questionnaire specifically a google form as its data instrument. Due to the implementation of the Movement Control Order (MCO) throughout Malaysia, the questionnaire was distributed online as no face-to face data collection was allowed during this period, to comply with the social

distancing preventive guidelines. Within two to three weeks period, the data was collected and the researchers managed to get a 100% response rate by the end of the third week.

Findings

In achieving the first research objective for this study, a multiple regression analysis was conducted and results for both male and female undergraduates were tabulated in Table 1. For male undergraduates, it was found that the R^2 value was .119, in which the three independent variables of unhealthy food accessibility, healthy lifestyle and influencer marketing, explained 11.9% of the variance for unhealthy diet, with significant F value of .001. Besides, the value of Durbin Watson for male students was 2.047 which was slightly over the good value range of 1.5 to 2. The results have revealed only unhealthy food accessibility has no significant influence towards male undergraduates' unhealthy diet. Healthy lifestyle was found to be the most influential determinant of male's unhealthy diet followed by influencer marketing ($\beta = -.262$, $p < .05$; $\beta = .229$, $p < .05$ respectively). Contrary, unhealthy food accessibility, healthy lifestyle and influencer marketing explained 28.8% of the variance for female undergraduates' unhealthy diet, with the significant F value of .000. The Durbin Watson value was 1.975 which can be considered as in good range value. For female undergraduates, influencer marketing has the greatest influence towards the unhealthy diet, followed by the variable of unhealthy food accessibility ($\beta = .416$, $p < .05$; $\beta = .192$, $p < .05$ respectively). This is in line with what was found by Djafarova and Rushworth (2017) in which results from research reflected that young female users' purchase behaviour are influenced by the Instagram celebrities. In fact, the differences between the predictors between the genders are consistently supported by the previous studies' usual findings. This may be concerning the influence of stress among the female students as Ahmed et al (2014), highlighted how female students' food selection were more influenced by stress, compared to male students. Female students were found to have higher level of stress than males (Choi, 2020) are more likely to drink larger amount of beverages as well as high fat and sugar content snacks (Ahmed et al., 2014). Plus, high calorie food intake was found to be associated with the increased stress among the undergraduate female students as cited by Khaled et al. (2020). Hence, female students who engaged in healthy lifestyle are still likely to practice unhealthy diet, considering they are easily stressed and prone to consume unhealthy food when they are feeling down. Nevertheless, it can be concluded that male and female undergraduates have different predictors towards their unhealthy diet but influencer marketing can significantly influence the unhealthy diet for both genders, signifying the achievement of the first research objective for this study.

Table 1

Multiple Regression Analysis Based on Gender

Gender	Independent variables	Standardized Coefficients Beta	t	Sig.
Male	Unhealthy Food Accessibility	.105	1.178	.241
	Healthy Lifestyle	-.262*	-3.078	.003
	Influencer Marketing	.229*	2.506	.013
	R Square	.119		
	F	5.781		
	Sig. F Value	.001		
	Durbin Watson	2.047		
Female	Unhealthy Food Accessibility	.192*	3.137	.002
	Healthy Lifestyle	.027	.425	.671
	Influencer Marketing	.416*	6.506	.000
	R Square	.288		
	F	31.802		
	Sig. F Value	.000		
	Durbin Watson	1.976		

*Significant at 0.05 level

On the other hand, another multiple regression analysis was conducted in identifying the most influential variable of unhealthy diet based on the undergraduates' sources of study fund (see Table 2). The results have revealed that none of the independent variables can significantly influence the unhealthy diet among undergraduates who used self-income to support their study while influencer marketing is the only independent variable which can influence the unhealthy diet of the undergraduates who are being financially supported by the family ($\beta = .207$, $p < .05$). In addition, influencer marketing variable was found to have the most significant influence towards their unhealthy diet, followed by unhealthy food accessibility variable ($\beta = .400$, $p < .05$; $\beta = .280$, $p < .05$ respectively). Likewise, a study from Denmark has indicated that cinema, television and printed advertisements can influence the purchase intention of less people as compared to the influencers' advertisement (Høck, 2020). Besides, it was also found that adolescents' behaviour in selecting their food can be affected by how the influencer marketing was being used to promote unhealthy food (Coates et al., 2020). Since these students are receiving financial support from the parents and family, these students had no difficulties in committing themselves to consume unhealthy food. As a matter of fact, food price would be the ultimate temptation for the young adults in the age of 18 to 24 years old in Australia to purchase the advertised food (Molenaar et al., 2021). In comparisons to the R Square values for each of the fund category, all independent variables have explained 6.5% of the variance for unhealthy diet, with significant F value of .470 for the self-income students, 6.2% of the variance for unhealthy diet, with significant F value of .019 for the family-supported students and 29.2% of the variance for unhealthy diet, with

significant F value of .000 for loan or sponsorship funded students. Furthermore, the value of Durbin Watson for self-income students was 2.116, 1.785 for family supported students and 1.731 for loan or sponsorship funded students. Based on these values, it reflected only self-income students did not achieve the good value range of 1.5 to 2. Hence, it can be concluded that the second research objective was achieved with the demonstration of influencer marketing as the sole prominent factor of unhealthy diet among family funded students as well as the single predictor for loan or sponsorship funded students.

Table 2

Multiple Regression Analysis Based on Sources of Study Fund

Sources of Study Fund	Independent variables	Standardized Coefficients Beta	t	Sig.
Self-income	Unhealthy Food Accessibility	.194	1.081	.287
	Healthy Lifestyle	-.085	-.500	.620
	Influencer Marketing	.112	.592	.558
	R Square	.065		
	F	.861		
	Sig. F Value	.470		
	Durbin Watson	2.116		
Family support	Unhealthy Food Accessibility	.085	1.047	.297
	Healthy Lifestyle	.024	.300	.765
	Influencer Marketing	.207*	2.531	.012
	R Square	.062		
	F	3.405		
	Sig. F Value	.019		
	Durbin Watson	1.785		
Loan/Scholarship	Unhealthy Food Accessibility	.280*	3.808	.000
	Healthy Lifestyle	-.096	-1.271	.205
	Influencer Marketing	.400*	5.087	.000
	R Square	.292		
	F	23.249		
	Sig. F Value	.000		
	Durbin Watson	1.731		

*Significant at 0.05 level

Conclusion and Recommendations

In conclusion, findings from regression analyses have reflected the effects of unhealthy food accessibility, healthy lifestyle and influencer marketing towards the unhealthy diet of undergraduates in Kelantan. Based on the gender comparisons, female students' diet was found to be affected by unhealthy food accessibility and influencer marketing whereas males' diet can be affected by healthy lifestyle and influencer marketing. In comparisons to sources of study fund, sponsored students' diet was found to be affected by influencer marketing and

unhealthy food accessibility while the unhealthy diet for students who are being supported by family; can only be affected by the influencer marketing. Generally, influencer marketing was identified as the only independent variable which may affect the undergraduates' unhealthy diet regardless of their genders as well as their sources of study fund. Inference to this, the effects of independent variables towards the dependent variable are not visibly distinguished between the genders but the differences are apparent between the sources of study fund. Therefore, it is recommended for the undergraduates to be concern of their diet especially if they are funded by loan or sponsorship. When these students get to have the privilege of greater buying power than other students, they have the tendency to get involved in unhealthy diet due to the influences of marketing effort put by the respective food company. The students should be able to evaluate their behaviour and differentiate the worthiness of their decision to consumer unhealthy food regardless of the food availability convenience and the influential social media marketing. The negative side effects of unhealthy food such as obesity, cardiovascular diseases and others may emphasize the students; the goodness of consistently taking care of their diets. According to Fuhrman (2018), individuals are the ones with power who can significantly direct their attention and effort towards solving the eating problem by changing the eating habits. In other word, individuals need to be personally in charged of what they eat and how they eat, disregarding any unnecessary influential marketing strategy, directed by the social media influencers. Moreover, since unhealthy food accessibility is somehow related and may affect the unhealthy diet of undergraduate students, it is suggested for them to prioritize their health and think twice before getting any unhealthy food. This is considering the irrelevancy of recommendation to relocate every food outlet, convenience store to another place which is far from the universities' compounds, as food delivery is widely used around Malaysia (Durai, 2021). Other than that, future researchers are recommended to conduct in every campus of universities in Kelantan and if it is possible, it would be better to be conducted in every tertiary educational institution in Malaysia since each institution may be represented a different eating culture and environment. The future researchers are also suggested to use a probability sampling method to emphasize on the generalizability of the study's findings. This will as well reduce the bias for sampling which is most likely to occur in a study with non-probability sampling techniques.

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