

UNDERSTANDING FOOD INSECURITY AMONG PUBLIC UNIVERSITY STUDENTS

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ABSTRACT

This article aims to understand food insecurity among public university students. The informants were four university students (two males and two females), all of whom were selected purposively. Face-to-face interviews were conducted in accordance with an interview protocol so that the required information may be collected properly. This was crucial to ascertain and comprehend the contributing factors, coping strategies and consequences of such food insecurities. Interviews were audio-recorded and transcribed verbatim. In addition to that, thematic analysis was applied to identify the codes used to form themes. The conclusive findings showed that the sudden closure of cafeterias, financial problems, lack of personal transportation, low quality of food and time constraints were among the factors contributing to food insecurities. Coping strategies were applied to combat these, including: purchasing food outside campus grounds, forcing down dissatisfying cafeteria and mini-mart meals, storing foodstuff, reducing meal portions, choosing cheaper foods, opting for cleaner cafeterias, requesting outside food from friends and skipping meals completely. Consequently, there were dire effects, such as anxiety, lack of energy, inability to focus during classes and falling ill. Therefore, the Malaysian Ministry of Education as well as the university authorities themselves should be made aware of the food insecurity problems faced by university students. Further study in the future with a larger number of students involved is recommended.

Keywords: Food Security, University Students, Contributing Factors, Coping Strategies, Effects

ABSTRAK

Artikel ini bertujuan untuk memahami pengalaman mengenai keadaan tiada jaminan kedapatan makanan dalam kalangan pelajar universiti. Informan merupakan empat orang pelajar universiti (dua lelaki dan dua perempuan) yang dipilih mengikut persampelan bertujuan. Temu bual bersemuka telah dijalankan berdasarkan protokol temu bual bagi mengumpul maklumat berkenaan dengan faktor-faktor penyumbang, strategi daya tindak, dan kesan terhadap tiada jaminan kedapatan makanan. Sesi temu bual telah direkodkan dan ditranskripsikan secara verbatim. Analisis tema digunakan untuk mengenalpasti kod-kod yang digunakan untuk membentuk tema. Hasil kajian menunjukkan penutupan kafe secara tiba-tiba, masalah kewangan, tidak memiliki pengangkutan, kualiti makanan yang tidak memuaskan, dan kekangan masa merupakan faktor-faktor penyumbang kepada tiada jaminan kedapatan makanan. Strategi daya tindak seperti mencari makanan di luar kampus, terpaksa mengambil makanan yang dijual di kafe dan kedai

runcit walaupun tidak berpuas hati dengan makanannya, menyimpan makanan, mengurangkan saiz hidangan, memilih makanan yang lebih murah, memilih kafe yang lebih bersih, meminta kawan membeli makanan dari luar kampus dan tidak mengambil makanan merupakan strategi telah diamalkan semasa menghadapi tiada jaminan kedapatan makanan. Kesan daripada tiada jaminan kedapatan makanan adalah seperti rasa resah, rasa lesu, tidak dapat menumpukan perhatian dalam kelas dan sakit. Kesimpulan, Kementerian Pendidikan Malaysia mahupun pihak berkuasa universiti harus mengambil berat tentang isu tiada jaminan kedapatan makanan dalam kalangan pelajar universiti. Dicadangkan satu penyelidikan yang melibatkan saiz sampel yang lebih besar harus dijalankan pada masa depan.

Kata Kunci: *Tiada Jaminan Kedapatan Makanan, Pelajar Universiti, Faktor Penyumbang, Strategi Daya Tindak, Kesan*

INTRODUCTION

Malaysia is an aspiring nation that is currently striving to become a developed country by the year 2020. In order to actualize its visions and goals, the education sector plays a vital role in producing highly skilled manpower to support the country's agendas in development. (Grapragasem, Krishnan, & Azlin, 2014). As a result, Malaysia is reported to have 20 well-established public universities, and the number of students enrolled in 2011 alone totaled to 520,979 (Malaysia Education Planning and Research Division, 2012). The increasing number of universities amounts to more opportunities for youngsters from diverse backgrounds to further their studies at tertiary level. For those hailing from families of low socio-economic status, though, their chances of surviving university life may be an issue. Subsequently, their financial management and dietary behaviors become topics of interest among researchers.

In brief, the students' income comes from scholarships or study loans, pocket money provided by their parents or part-time jobs, i.e. self-sponsored. A majority of them was reported to have an income of less than RM 500 a month (Muniady, Al-Mamun, Yukthamarani Permarupan, & Noor Raihani, 2014). With the limited income, the students are required to spend wisely on food, entertainment, transportation, study materials, clothing, electronic devices and housing rentals (Shahryar & Tan, 2014). Nevertheless, not all of them showcase appropriate financial behavior, which is to save money by not splurging on unnecessary possessed things (Mohamad Fazli et al., 2008). This was worsened by the identification of several problematic dietary patterns among Malaysian university students, comprising irregular meals, high consumption of fast food and lack of fruits and vegetables in their diets. Some of them were also discovered to have nutrient intakes lower than the Recommended Nutrient Intakes for Malaysia (RNI) (Ganasegeran et al., 2012; Abdul Hakim, Muniandy, & Ajau, 2012; Gan, Mohd Nasir, Zalilah, & Hazizi, 2011). Evidence from the various studies mentioned indicated that the financial management skills and dietary behaviors of the students were not acceptable. Their

inconvenient surroundings and conditions exposed them to a more severe problem known as food insecurity.

Food security is a multi-dimensional concept. There are more than 200 definitions of food insecurity listed and recorded by Smith, Pointing, and Maxwell (1993). However, the prevailing and widely accepted definition is 'food security exists when all people, at all times, have physical and economical access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life' [Food and Agriculture Organization (FAO), "World Food Summit Plan of Action", 1996, para.1]. The definition was formed during the World Food Summit 1996 in Rome and was established based on four 'pillars', namely the physical availability of food, economic and physical access to food, food utilization, and stability of the three dimensions over time (FAO, 2008).

Global food productions and food prices (food availability) were prioritized by researchers worldwide after the global food crisis from 1972 to 1974, as it was believed that these factors were fundamental to food insecurity (Maxwell and Smith, 1992). Subsequently, due to the ideas from Sen (1981) that emphasized food entitlements (people's ability to obtain food in a socially acceptable way) were to be given equal attention as food availability while dealing with famine, the food accessibility dimensions were gradually accepted widely as an element of food security (Maxwell, 1996). Later on, food utilization was introduced to reflect the importance of using food ideally. This included proper food preparation, good care, food distribution among household members and feeding practices. The dimension also involved the biological utilization of food consumed, specifically food ingestion and food metabolism. Lastly, food stability was another dimension proposed to address the stability of the latter three dimensions over time because inadequacy of food may also occur due to 'shocks' such as adverse weather change, political or economical factors. Food security exists when all the dimensions are present at the same time (FAO, 2008).

Children under the age of five, lactating mothers, senior citizens, widowed or divorced women, female-headed households, disabled people, families with members infected by HIV/AIDS or other chronic illnesses and people living in remote areas were the main targets for researchers interested in food insecurity issues (Ellis, 2003). Recently, attention on food insecurity issues among university students started to gain attention when studies identified that a high percentage of university students were susceptible to food insecurity. A study conducted among 354 students who attended the mid-sized, rural University of Oregon presented that 59% of the students were found to be food-insecure (Patton-López, López-Cevallos, Cancel-Tirado, and Vazquez, 2014). Furthermore, another study conducted among 399 university students in Australia revealed that 12.7% of students were found to be food-insecure (with hunger) while another 46.5% were identified to be food-insecure (without hunger) (Hughes, Serebryanikova, Donaldson, and Leveritt, 2011). The detection of such high percentage of food insecurity highlights that there

is a need for strict monitoring on the food security status of university students. Food insecurity among university students were also given attention by local researchers; several activities on related issues had been conducted. For example, Norhasmah, Zuroni, and Marhana (2013) reported that 67.1% of the public university students in Malaysia experienced food insecurity.

From existing literature, several contributing factors – low income (Patton-López et al., 2014), reliance on government support, house-renting (Gallegos, Ramsey, and Ong, 2013), ethnicity/race and unemployment (Freudenberg et al., 2011) – were acknowledged to be correlated with food insecurity among university students. Some coping strategies observed by the affected university students to deal with the burdens of food insecurity include living with their parents, working, borrowing money from friends (Hughes et al., 2011) and family, drinking fluids and practicing self-distraction (Kassier and Veldman, 2013).

The main task of university students is to excel in academics. A proper, balanced diet is believed to help students of all ages in succeeding, education-wise. The statement was supported by evidence from previous studies which showed that daily consumption of milk, vegetables, and fruits (MacLellan, Taylor, and Wood, 2008), better dietary quality (Florence, Asbridge, and Veugelers, 2008) and adherence to dietary recommendations (Kleinman et al., 2002), low-fat eating behavior (Nazirah, Kartini, Khairil Anuar, & Ajau, 2012) and healthy nutritional status (Lee & Wan Abdul Manan, 2014) were positively associated with students' academic performance. Yet, the attainment of high-quality, nutritious food remains a challenging task among university students. Most of the time, they depend solely on the government's regulated loans or scholarships and the availability of food from their surroundings. This was exacerbated by the recent increase in food prices (Tey, 2010). A previous study had also shown that students are inclined to sacrifice their food money in favor of other expenses such as textbooks, tuition fees and housing utilities (Robb, Moody, and Abdel-Ghany, 2011). Food insecurity among students ranging from schoolchildren to university students is a great concern as it was found to correlate positively with high school absenteeism (Belachew et al., 2011), poor academic performance (Jyoti, Frongillo, and Jones, 2005) and poor health outcomes (depression) (Freudenberg et al., 2011). In an effort to understand food security issues (definitions and concepts of food security, contributing factors of food insecurity, coping strategies during food insecurity and negative effects of food insecurity) among university students, the present study was conducted to explore experiences of food insecurity among the university students. The interview was guided by the following questions:

- (i) What is university students' understanding on food insecurity?
- (ii) What are the contributing factors of food insecurity among university students?
- (iii) How do university students cope with food insecurity?
- (iv) What are the consequences of food insecurity among university students?

LITERATURE REVIEW

Definitions and Concepts

In an aforementioned preview, it was stated that about 200 definitions of the food security were proposed, which seemed complicated. In order to simplify the matter, throughout this article, only the official definition which was introduced by FAO in 1996 was referred to. The definition is ‘food security exists when all people, at all times, have physical and economical access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ [Food and Agriculture Organization (FAO), “World Food Summit Plan of Action”, 1996, para.1]. Based on the definition, several dimensions of food security were also identified, i.e. food availability, food access, food utilization, and food stability.

The definition for food availability is ‘physical presence of the food in the area of concern through all forms of domestic production, commercial imports, and food aid’ [World Food Programme (WFP), 2009, p. 23]. Food access is the ‘ability to acquire adequate amounts of food, through one or a combination of own home production and stocks, purchases, barter, gifts, borrowing and food aid’ (WFP, 2009, p. 23). Food utilization is the ‘use of the food to which they have access and individual’s ability to absorb and metabolize the nutrients – the conversion efficacy of the body’ (WFP, 2009, p. 23). Lastly, food stability is defined as the stability of the other three dimensions mentioned which were food availability, food access, and food utilization. A comprehensive and clear conceptual definition of food security was crucial as it was used as a standard to recognize food-insecure victims.

Contributing Factors of Food Insecurity

For this section, the risk factors of food insecurity were discussed. Risk factors of household food insecurity was defined by Campbell (1991) as ‘anything that limits either the household resources (money, time, information, and health) or the proportion of those resources available for food acquisition’ (Campbell, 1991, p. 413). According to Meldrum and Willows (2006), reliance on financial aid was one the factors driving university students to food insecurity. In addition, Freudenberg et al. (2011) also identified several other risk factors, such as ethnicity, household income, financially self-supported students and working students. From the studies mentioned above, the focus was mainly given to the socio-demographic aspects of food insecurity. However, it was believed that the risk factors of food insecurity issues among university students were not due to financial factors alone. Therefore, the present study was conducted to identify other potential risk factors, perhaps environment-related.

Coping Strategies during Food Insecurity

In this segment, works related to coping strategies practiced by food-insecure students were reviewed. Duhaime and Godmaire (2002) outlined three main patterns of the strategies: to improve accessibility toward the food, to increase the participation in new activities so that a better income is obtained and to seek aid from local

authorities. Consistent with the ideas of Duhaime and Godmaire (2002), Hughes et al. (2012) reported that students were prone to improve their food insecure condition by living with their parents, working to generate income or even borrowing money and food. Norhamah et al. (2013) categorized the coping strategies into two groups: food-related coping strategies and non-food coping strategies. Some examples for food-related coping strategies involved consuming cheaper food, reducing the types of food available and eating less meals in a day. Non-food coping strategies, on the other hand, included saving expenses, reducing saving expenses and having financial planning. Both of the studies mentioned above applied the quantitative approach (questionnaire) to merely identify the coping strategies of university students, but the present study might contribute to the existing knowledge by helping to explain the process of how certain coping strategies were practiced.

Consequences of Food Insecurity

Here, the negative effects of the food insecurity were discussed. Patton-López et al. (2014) linked food insecurity with lower academic achievement. However, the finding was not consistent with the findings of Kassier and Veldman (2013). The inconsistent findings from previous studies indicated that more research was needed in order to clarify the correlation between academic achievement and food insecurity. Besides that, Freudenberg et al. (2011) cited food insecurity as the cause of poorer health and depression among university students. Unfortunately, all the studies mentioned applied cross-sectional study, so the causal inferences could not be generated. Besides that, due to the scarcity of the existing studies, it was recommended that more studies regarding the negative effects of food insecurity among university students should be conducted, as the knowledge generated from the studies helped to guide the health practitioners or policy makers to make important decision in the issues related to the food insecurity among university students such as implementation of intervention programs and formulation of policies.

METHODS

Most of the previous studies applied quantitative research method to examine food insecurity problem among university students. Therefore, an initiative was taken in the present study by applying qualitative research method to explore food insecurity issues among university students. The study applied qualitative study design (case study approach) that involved a series of face-to-face interviews with the university students. The selected students were asked about their understanding on food insecurity, perceived contributing factors, coping strategies to ease their burdens and its effects on normal daily life.

Purposive sampling instead of probability sampling was used. This is because researchers needed to ensure that the samples obtained are uniquely suited to the intent of the study (Fraenkel, Wallen, and Hyun, 2012). Five university students were recruited from a nutrition-related lecture. Nutrition students were chosen as it was believed that their knowledge in nutrition helped to clarify the

quality of food available at the hostel. It is given that they are more familiar with the conceptual definition of healthy food compared to non-nutrition students. One withdrew from the study due to personal reasons. Four of the selected students (two males and two females) were willing to share their observations. The recruitment of informants was based on the recommendation from Creswell (2007, as cited in Marshall, Cardon, Poddar, & Fontenot, 2013) where he recommended three to five interviewees for each case study. The sample size for qualitative study is normally small since it involves in-depth interview among the informants in order to explore and understand the food insecurity condition intensively (Miles and Huberman, 1994) and generalizability of the data toward a bigger population is not important (Frankel et al., 2012) in qualitative research. This justified that the selection of four informants in the present study was adequate. After all, most of the information was presented descriptively without involving any inferential statistics that requires representative sample with adequate statistical power.

Procedures

Semi-structured interviews were conducted during the data collection phase. An interview protocol as presented in Table 1 was prepared to assist in the interview process. The interview guide approach is a “technique in which topic of interest is specified in advance, in outline form and the sequence as well as wordings of the questions during the interview were based on the initiative of the interviewer”. This approach is advantageous in the sense that it helps increase the comprehensiveness of data and leads to a more systematic interview for each participant. [Patton (2008) (as cited in Fraenkel, Wallen, and Hyun, 2012: 452)]. Each of the interview session was audio-recorded. In this study, the students were interviewed regarding their experiences with food insecurity and they were provided probes by the interviewer to aid them in recalling their past experiences. The students were each interviewed three times based on availability at their convenience (three times x four students = 12 interviews). The recurring interviews were believed to have helped achieve data saturation. Each session took about 20 minutes. The first interview session was a light discussion with the students regarding the topic of interest in order to establish rapport with the informants. In the second interview, all the questions in the interview protocol were directed to the informants. For the third interview, topics that may have been left out in the second interview were covered.

Table 1: Interview Protocol

No	Questions
1	Where do you normally obtain your staple food?
2	Would you briefly describe the foods you eat within a day, including breakfast, brunch, lunch, afternoon tea, dinner and supper?
3	In your point of view, what do you understand about the term “food insecurity”?
4	What were the factors that contributed to your food insecurity condition? Explain.

5	What action did you take when you found out that you were food-insecure? Explain.
6	In what way were you affected by your food insecurity condition? Explain.

Ethical issues

Verbal consent was obtained from the participants prior to the interview. The participants were given a heads-up on the purpose of the study. The identities of the participants were kept confidential. The participants were informed that they were allowed to leave the study at any time and would not be sanctioned for doing so.

Data Analysis

The data analysis was carried out using thematic analysis. Thematic analysis is ‘a process for identifying, analysing, and reporting patterns (themes) within the data. It minimally organizes and describes the data set in (rich) detail. However, it frequently goes further than this, and interprets various aspects of the research topics (Braun and Clark, 2006: 79). The recordings of the interview were transcribed verbatim. The transcription process itself was useful for the researcher to get acquainted with the data (Riessman, 1993). With the available transcribed notes, the breadth of the data was familiarized through ‘repeated reading’ to search for meanings and patterns. The coding process was carried out manually with highlighters or coloured pens. Codes are defined as ‘the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon’ (Boyatzis, 1998: 63). Potential themes were formed from the codes documented. Plus, all the relevant coded data extracts were categorized in the identified themes (Braun and Clark, 2006).

RESULTS

Characteristics of Informants

The mean age of the informants was 21.5 ± 1.3 years. There were two male and two female students, three Malays and one Chinese; all of whom are taking nutrition-related courses. They live in the university’s dormitories. Two of them receive government-sponsored scholarships (not under the same organization), one is sponsored by a private company and another has a study loan. Of the four, three have parents who are involved in the business sector. The parents of the remaining one are government servants.

Eating Pattern of Informants

The main sources of food among the interviewees are the two available cafeterias and two mini-marts within the college area. The breakfast meals of Students A, C and D feature the following: chocolate or peanut butter on bread; sardine sandwiches; and chocolate, vanilla or maize buns displayed at the mini-marts. Student B, on the other hand, preferred biscuits purchased outside campus grounds due to the lack of variety at the mini-marts. None of them had brunch regularly. For lunch, they all ate at whichever cafeteria that is nearest to their faculty or hostel (the faculty is

a 10-minute walk from the hostel). Common meals included white rice with side dishes of vegetables, eggs, bean curd, chicken or fish. Among the male students, afternoon tea was popular. They often had cekodok, keropok lekor and karipap; all of which were available at the hostel cafeteria. The students' dinner menu at the cafeterias typically encompassed fried rice, char kuey teow, rice vermicelli soup, white rice with beef soup, yellow noodle soup, etc. Both female informants usually consumed biscuits or milk for their supper.

Understanding of Food Insecurity

When asked about the term 'food security', three out of four students mentioned that they had heard of it before. Students A, B and C admitted that it was mentioned during a lecture but it was not emphasized on. Another source of information was from a simple conversation with a friend (Student C). Only Student D expressed that the term was unfamiliar.

Regarding their understanding of the term 'food security', all the students were requested to explain food security in their own words. The findings showed that most of them had their own distinctive understanding on food security. For example, Student A explained food security by emphasizing its availability dimension:

A: "It means feeling insecure when the food supply recedes or becomes insufficient. In this case, for instance, when a nation's food stock has depleted, the nation should try to find another alternative such as importing food from another nation in order to fulfil the needs of the country's population."

Conflicting with Student A, both Students C and D shared a similar view by defining food security through its accessibility and utilization dimensions:

C: "From what I know, the meaning of food security is something like getting food that is sufficient, safe or clean. Safe to eat as well as nutritious."

D: "I think food insecurity is a condition where people are not capable of getting food and due to that, they suffer from various kinds of diseases. Something like that. I also think the occurrence happens because of financial and body image factors."

On the other hand, Student B voiced out her unique view on food security through the stability dimension:

B: "Every time [I am] eating, [I] will definitely think: is this food safe or not? Or whether [I] would explain food shortage in the future. While thinking, [I] also wonder if there's any more food for myself, once I've finished this meal. Will I get food for my next meal?"

The findings revealed that most of the students had basic, not extensive, knowledge in food security issues. The definitions given were all acceptable but not broad enough to cover the whole scope of food security.

Self-Evaluated Food Security Status

Based on the definitions given by students in the last section, Students A and D evaluated themselves as being food-insecure by expressing:

A: "I receive money from another party, so if the party does not provide me the money on time, then I will face a problem. I cannot buy food items, hence food insecurity conditions might appear."

D: "Because I do not take good care of my eating habits, I skip breakfast and sometimes dinner too, and [I] only have lunch. This is mainly due to financial factors. I am now having body weight issues. I can feel the effects [of it], such as not being able to focus in class. Sometimes I feel a distinct lack of energy because I do not consume sufficient and nutritious food. Plus, I am overly obsessive with my body weight, which means I do not eat."

On the other hand, Students B and C thought that they were food-secure:

B: "I am feeling secure with food. I feel that it is easily available, implying that my food supply would not be cut off. I think I am in a stable condition."

C: "Whatever [I] want to eat is available and nutritious as well, including the ones I prefer."

As such, the present study involved two self-evaluated food-secure and two self-evaluated food-insecure students. From these two separate groups, their experiences regarding food security during their campus life were explored.

Contributing Factors of Food Insecurity

First of all, all of the interviewees worried if the cafeterias and mini-marts accessible to them were to suddenly close. Their hostel cafeteria occasionally shut down without any notification, especially on Saturdays or Sundays. They depended solely on that cafeteria because the faculty cafeteria does not operate during weekends. If the hostel cafeteria closed without prior notice, the students would encounter difficulty in obtaining enough food for that particular day. One of the reasons for the cafeteria's sudden closing was the absence of the chef, as clarified by Student B:

B: "Sometimes the chef does not come. Normally, there is no problem during lunchtime. It mostly happens in the evening, during dinner. Suddenly the chef does not show up, so the cafeteria is closed and we have nothing to eat."

The cafeteria was also once ordered to be closed down due to hygiene issues. Student C stated:

C: "During the previous semester, it happened around four to five times. Both cafeterias were closed, [the one] up there was closed [and the one] down here was also closed, so within the residential area, no one was selling food. That was the worst condition. It usually lasts for one day. Besides that, the cafeteria was ordered to close down due to hygiene issues, for about one week. [It] involved both cafeterias."

Furthermore, the cafeteria is normally closed during semester breaks, so the students who remained on campus may find it difficult to get enough food. This condition was explained by Student D below:

D: "The cafeteria was closed because of semester break... One time I stayed back for a day. Both were closed; I did not know what I could do [regarding the problem]."

The second contributing factor influencing food insecurity among university students was financial problems, explicitly lack of money and high outflow on non-food items. Nonetheless, all students thought that the food was reasonably priced. Financial support was provided by their families (all four students) despite the provision of scholarships and study loans. When comparing the students who self-evaluated themselves as food-secure (A and B estimated that RM 400 was spent on food), the food-insecure students were discovered to have spent less on food (Student C spent RM 300 monthly while Student D spent RM 200 on food). Student A and C shared the same point of view – the delay of monetary transfer from the related organization might be one of the factors contributing to their food insecurity:

A: "The problem to get food might be caused by my financial status. I am sponsored [by a company]. If the company delays the transfer of allowance to me, I might face problems in buying food."

Only one student (Student D) expressed that the low amount of sponsorship was not enough to sustain the for the entire semester's expenses:

D: "Yes... Yes, I think finance is a problem since I am sponsored [by a government agency], I get [an amount of] money, but in one semester there are 16 weeks. I think it is not enough."

Moreover, student D was found to be struggling with the high cost of non-food necessities:

D: "To spend in a day... RM 50 a week is tough. Why? We spend a lot on club T-shirts, books, so obviously [the money] is not just for food."

Transportation was another contributing factor identified by the informants, apart from closing of cafeteria and financial problems. The impact was obvious among those who do not own their own vehicles (Students A and D):

A: "Besides that, transportation problem. For example, when food is not available here, the closure of cafes and mini-marts, so we need to travel out to get food, and we might need to take public transports or transport provided by the university (buses) to go out."

Modes of transportation for two students were public buses and university buses which were responsible to send students to the nearest commuter station. Besides that, other modes of transportation were motorcycles and friend's cars. The student who owned a transport was found to travel further away from their hostel as compared to those who took buses.

Furthermore, the quality of food, or lack thereof, was also found to have affected the food security status of university students. One of the sub-factors under this main theme was that the food sold lacked variety. All the students agreed on this point:

A: "If based on the concept of 'nutritious food', sometimes I do not think it is enough because here, for example, most of the food available is rich in carbohydrate, lack of vegetables and sources for fruit is scarce."

Moreover, they felt that the food sold in the cafeteria was not to their liking, especially Student B:

B: "Do not taste good. Sometimes (the food is) too oily, sometimes (the food is) too salty. The surface of the tomyam soup is covered by a layer of oil and it includes curry, a layer of oil floating on it. Besides that, it tastes differently each day, for example, today you taste tomyam, do feel the spicy, tomorrow it is extremely hot, then the coming day it tastes only a bit spicy, not consistent at all."

The students also complained about the cafeterias' hygiene. The experiences of Students A and B are shared below:

A: "Regarding the cleanliness of the plates, it considered clean as the plates are cleaned and wiped, for the food preparation itself... as most of the time they (operator) let the food in an area uncovered. If the flies stop on it, it feels like 'contaminated'."

B: "Because I once saw them preparing the food, they did not clean it (vegetables), just cut it and cooked directly. Even for the juices for example carrot juice. They directly processed it without removing the head and the tail of the carrot."

Lastly, time constraint was recognized by all the students as another barrier for them to maintain a proper diet. They attributed this to their packed lecture schedules:

D: "Time, may be do not have enough time, ya... because I... as this semester (I am) quite busy, from eight in the morning until five in the afternoon, straight, no... gap in between only one hour, one hour is the only time we can spare. Then suddenly if we have... what we call... assignment need to be completed and submitted, so (we) need to concentrate, the one hour needs to be used to work (on the assignment)."

Time restraints may have also been caused by the extension in lecture time:

C: "For example, we have a class (normally lab) until one o'clock actually, then we will have a gap for rest until two o'clock. If the class expected to end at one o'clock to be extended until around one thirty so we don't have time to eat."

In conclusion, five main contributing factors of food insecurity were identified in the study. The identified contributing factors were: closure of cafeteria and mini marts (sudden closure without any prior notification, closure due to the absence of chefs, closure due to hygiene problems and closure during semester break); financial problems (delay of the sponsorship funds, small quantity of sponsorship funds and high expenses of non-food items); lack of own transportation (reliance on public as well as university-provided transportation); food of low quality (lack of variety, lack of foods that they actually like and sanitation issues); and time constraints (tight lecture schedules plus extensions in lecture time). All the related information gathered were based on the students' genuine experiences.

Coping Strategies of Food Insecurity

For each of the contributing factors of food insecurity, certain coping strategies

were practiced by the interviewees to overcome the shortage of food supply. First of all, when the cafeterias closed all of a sudden, they traveled to the nearby shopping malls to eat. All four students admitted that fast food became their favorite choice of food since it is easily accessible. Besides that, they might opt to eat food that are easily stored, such as instant noodles, biscuits, instant coffee, chocolate malt drinks or bread, when the situation calls for it:

A: "First alternative, we will travel out [nearby shopping mall or nearby food stalls (about 20 minutes of walking distance)]. The second alternative, (I) will consume the food stock that I have."

To handle financial problems, the students tried to reduce food consumption to ensure that they had a continuous supply of food for the future:

A: "I do (reduce the serving size of my food). For example, the price of a plate of rice costs RM1, if take half, then it costs RM0.50."

Students with such financial problems also picked cheaper food for their meals:

B: "I took only rice for lunch and dinner. I took only rice and vegetables. I avoided meat such as chicken and fish as a way to reduce my food expenditure."

Students with financial problems (A and D) had the tendency to spend money meant for food on other things:

B: "(to spend on non-food items) I have to reduce my expenditure on food. If I do not have to spend on those things (books and shirts for the club), I would have spent all the money on food. In a normal day, I expect to spend about RM12 only, so I need to reduce my food expenditure to RM10, I shall eat for about RM10 every day until I save enough for the shirt."

The students chose to take the university buses that were available (the bus fee was included in their tuition fee) instead of public buses in order to cope with their transportation problem. However, this implied that they had to spend more time waiting for the buses because the buses were inconsistent in timing as well as availability. Another option they had was to eat whatever that was available in the campus instead of spending extra money and time to travel:

D: "Transportation? Maybe. Because I do not own a transport, so I cannot go out. Here, we do not have variety in food so urgent for me to go out there to get other foods so that I would not get

'bored'. I need a transport to travel but I do not own a transport so I have to eat whatever that is available here.'

Pertaining to the shortage of food variety, the students had no other choice but to consume any food available as they are unable to travel outside the campus every single day, particularly those who do not have their own cars or motorcycles:

B: "As I mentioned just now, most of the food is high in fat, and then the choice of vegetable is little, sometimes, just as I mentioned, only few kinds of vegetables are available, so I force myself to take some, so to reach the requirement of nutrient need is quite impossible."

For those who do have their own means of transportation, buying food outside campus grounds became their favorite selection; outside food was described as having a wider assortment to choose from:

C: "For us, if we want to buy fruits, we need to travel to night market."

A student even requested friends who ate outside to buy food for them:

B: "For example, if my friends travel to (shopping mall) sometimes, I will ask them to buy food for me. Mostly from (fast food 1) and (fast food 2)."

Regarding the state of the cafeterias' hygiene, the students typically chose the cleaner one of the two:

A: "And then the second choice is to choose a cleaner cafeteria, for example here we have faculty and hostel cafeteria, we can compare the cleanliness of both cafeteria and choose a cleaner one."

If the utensils at the cafeteria had not been cleaned properly, they opted for plastic spoons and forks meant for take-away food instead:

C: "We have to use plastic spoon and fork that are for take-away food (if we feel that the spoons and forks are not properly cleaned)."

In the case of time constraints, most students decided to skip meals:

A: "(I) skip meal not because do not have money to eat. [I] skip meal because I do not have time to eat."

Some students opted to take light meal such as bread.

D: “[If I do not have time], I only eat bread.”

To sum up, several coping strategies were applied to counter the hindering conditions mentioned in the previous section (contributing factors). Still, some of the coping strategies – reducing both the quantity and quality of food consumed, spending on non-food items and skipping meals – were revealed to have impacted the students’ health negatively. Such strategies should not be encouraged, especially among those who are food-insecure.

Consequences of Food Insecurity

Pertaining to the issue of food insecurity, two students who deemed themselves to be food-insecure expressed their concerns about the consequences of their hostile condition. They developed a sense of apprehension regarding their nutritional well-being:

A: “From the context of energy need, I really feel worried because without eating in a day... makes me hard to do my work without eating.”

Feedback from the students also showed that food insecurity seemed to be the source of their energy depletion:

A: “Besides that, if the consumption of food is not enough, my body will become weak, so very difficult to do anything for that day, playing... studying... or even joining the activities at the hostel.”

Both of them mentioned that being food-insecure rendered them unable to focus during lectures:

D: “Ya, I am worried about having nothing to eat. I am still a student, I need much more nutritious food, so that I can concentrate on my study.”

A student also reported that he once suffered from food poisoning:

D: “I also think that it is a kind of food poisoning. I vomited, I had diarrhoea.”

In summary, it is mind-boggling that food insecurity actually exists in this era but the findings exposed that not only does food insecurity subsist; it also affects the daily routines and health of food-insecure students adversely.

DISCUSSION

Eating Pattern of University Students

Most of the students appear to take their main meals – breakfast, lunch and dinner – only when circumstances allowed them to. Proper meals are important in providing adequate energy, macronutrients and micronutrients to take on daily activities such as studying, carrying out group discussions and physical activities, as well as upholding good health (Herrera et al., 2003). Among the three meals, breakfast was given the most attention in previous studies due to the fact that a high percentage of food-insecure students skip it (Moy et al., 2009; Gan et al., 2011). Skipping meals is a habit that students need to avoid; studies show that it can potentially impair cognitive functions related to memory, and disturb test grades, school attendance, health, general wellbeing, etc., especially when breakfast is missed (Rampersaud, Pereira, Girard, Adams, and Metz, 2005).

Understanding of Food Insecurity

Since the informants major in nutrition, it was presumed that they are well-informed on current nutritional issues, chiefly food insecurity. The course's curriculum appears to be comprehensive and up-to-date if this is the belief, since food insecurity is a now a global public health issue. It affects a high percentage of households – mainly low-income ones – in both developed and developing countries (Coleman-Jensen, Nord, and Singh, 2013; Dhokarh et al., 2011; Ihab et al., 2012). Such comprehensive curriculum is vital in order to equip the students with the appropriate knowledge suited to nutritional issues before they enter the job market.

However, from the definitions given by the students, all of them seemed to be unable to explain food security with precision. This implies that their understanding of food security is not thorough. The definition was formed based on four dimensions: food availability, food accessibility, food utilization, and food stability. Two students (C and D) defined food security using the food accessibility and food utilization dimensions. Food availability that mainly refers to national-level food stock and trade market was mentioned by one student (A), while stability of food over time was used by another (B). A definition that included all four of the dimensions was important as FAO (2008) emphasized that food security only exists when all of the dimensions are present.

Self-Evaluation of Food Security Status

All of the students involved had given reasonable explanations for their self-evaluation regarding their own individual food security statuses. Nevertheless, as the interview progressed, those who rated themselves as food-secure did have some trouble with continuously attaining food that is both safe and high-quality. It can be inferred that due to the inadequate cognition of food security, they may have misclassified themselves. A complete, holistic understanding is necessary to classify one accurately.

Contributing Factors of Food Insecurity

Closing the cafeteria for one day, thus leading to a temporary cutoff of food supply among university students, has never been reported in any preceding research. This means that this is a unique factor that impacts only this specific group of students. The location of the campus – far from commercial areas – exacerbates the situation, consequently limiting the access to alternative sources of food during such situations. Living somewhere distant from food supply has been identified as a barrier for households to obtain enough food; eventually causing food insecurity among rural communities in particular (Zakari, Ying, and Song, 2014). With the presence of public transportation, the implication of shock on the students somewhat lessened but it was still found to have adverse psychological effect (worry). One of the perks of using qualitative method to collect information regarding food security is that it enables the ‘shock’ to be assessed more effectively as compared to the quantitative method.

Financial problem was the fundamental cause of food security. The findings of the present study corresponded with those by Freudenberg et al. (2011). Besides that, financial status was also known as a universal contributing factor not just among university students, but most of the vulnerable groups affected by food insecurity (Olson, Rauschenbach, Frongillo, and Kendall, 1996; Zakari et al., 2014). This is because their food supplies are mainly obtained from the market food system [which includes five stages of economic activities: production, processing and manufacturing, wholesaling, retailer, and consumption (Martinez, 2007)]. This means that they need to have the ability to earn money and buy food from sellers; they themselves are not a food productive unit. Since the second global food crisis in 2008 indicated the end of the cheap food era, it might influence the students’ choice on food (Tey, 2010). However, most students found that the prices of food within the campus were acceptable as the prices were cheaper as compared to the off-campus food stalls. This indicated that the prices of food in the campus were still under control and it served as a protective factor for the students who lived in the dormitories.

As mentioned earlier, the location of the campus makes the availability of personal transportation a crucial factor. Similarly, lack of own transport was found to be a factor affecting household food security status, especially among rural communities (Wauchope and Ward, 2012). The ownership of an automobile among university students should be given attention to. It increases their accessibility toward food that is abundant in variety and healthier as well. Furthermore, car ownership was found to increase the availability and consumption of fruits and vegetables (Bodor, Hutchinson, and Rose, 2013). The present study provided an insight that the geographical area of campus should be taken into consideration when assessing the food security status of university students.

Dietary diversity is defined as “the number of different foods or food groups consumed over a given reference period” (Ruel, 2003, p. 3912S). Dietary diversity

is a reliable indicator of diet quality, as the recommended dietary guidelines in Malaysia also encourage the consumption of a variety of food across the different food groups. A higher dietary diversity score was found to be associated with: a healthier diet; less fatty foods and refined grain consumption; more fruit, vegetable and whole grain consumption; and higher intake of total dietary fibre, calcium and vitamin C (Azadbakht and Esmailzadeh, 2011). Students' lack of variety in their food consumption was due to the low accessibility of the food from their surroundings. This was reflected in their strong intention to travel out of the campus in search of alternatives. The issue should be responded to by the university authorities. After all, a previous study showed that the types of existing stores were found to be linked to the healthy food availability index (Franco, Diez Roux, Glass, Caballero, and Brancati, 2008). Diversity in diet is important; it was found to be a protective factor for type 2 diabetes mellitus, hypertriglyceridaemia, obesity, hypercholesterolemia, hypertension, and increased low-density lipoprotein levels (Azadbakht, Mirmiran, Esmailzadeh, and Azizi, 2006). Since dietary diversity was closely related with the energy availability, it was considered as an indirect indicator of food security (Ruel, 2003).

Food hygiene was another issue that needed to be thought-out when dealing with food security among university students. Food-borne diseases mainly stemmed from improper food preparation or handling, either at home or at food service establishments. WHO recommended the “five keys to safer food” to increase the awareness on food and water safety during food preparation and handling. The keys are: keep the food clean; separate the raw and cooked food; make sure the food is cooked thoroughly; store the food at a suitable temperature; and use safe raw materials and water (WHO, n.d.). From the description of the students, the cafeteria operators obviously violated the two recommendations – keep the food clean and use safe raw materials and water – since the food was exposed to flies. Plus, unclean materials were used during food preparation. Food hygiene should be kept as the optimal priority. Any abuse could cause cholera, dysentery, typhoid, and Hepatitis A (Soon, Singh, and Baines, 2011).

Another contributing reason to food insecurity was time constraints. In the existing literature, time constraints were deemed one of the major barriers to a healthy lifestyle among university students. In a cross-sectional study involving private university students in Karachi, lack of time was identified to be associated with skipping meals and irregular physical activity among non-medical and medical students (Sajwani et al., 2009). Moy et al. (2009) added that students at a public university in Kuala Lumpur were prone to skip breakfast, lunch, and dinner due to the lack of time. The series of unhealthy practices due to the lack of time reflected poor time management skills among university students.

Coping Strategies of Food Insecurity

‘Coping strategies’ was defined by Davies [as cited in Maxwell (1996: 293)] as “fall-back mechanisms to deal with a short-term insufficiency of food”. Food

insecurity was a managed process as the experience of the food insecurity was found to be made up of a distinct sequence of events (Tarasuk, 2001). This implies that the sequences of emotional and behavioural changes were employed by individuals suffering from food insecurity due to inadequate access of food (González, Jiménez, Madrigal, Muñoz, and Frongillo, 2008). Some coping strategies such as opting for cheaper food, reducing the quantity of food and skipping meals were considered as general practices adopted by any individual suffering from food insecurity. This is due to the fact that such practices had been used as indicators for measuring food insecurity (Maxwell, 1996; Norhasmah et al., 2011).

Consequences of Food Insecurity

Based on the information obtained, the students tended to skip meals or purchase unhealthy food in an environment where not much is available. These practices seemed to be producing adverse health effects that clearly influence their daily activities. Food-insecure students felt less energetic when dealing with their daily routines, including studying. Students with food insecurity were also found to focus less during lectures. The findings of the present study could be used to explain the negative relationship between food insecurity and academic performance (Patton-López et al. 2014). In the study, only the physical manifestation of the food insecurity could be assessed. The individual that endured a long period of food insecurity was at risk of contracting micronutrient deficiency (iron, vitamin A, zinc, and iodine) (Shetty, 2009) or chronic diseases (self-reported hypertension and hyperlipidemia and laboratory or examination evidence of hypertension and diabetes) (Seligman, Laraia, and Kushel, 2010). Hence, it is important for the university authorities to take the initiative to monitor food insecurity among university students; concentrating more on those from poor socio-economic backgrounds.

CONCLUSION

In the present study, food insecurity among university students were mostly caused by five factors: closure of the campus cafeterias; financial problems; lack of own transportation; low quality of food; and time constraints. For each specific problem, coping strategies were applied to deal with the problems, including seeking food outside campus grounds, consuming the food available at the cafeterias and mini-marts irrespective of personal dissatisfaction, storing foods, reducing the size of meal portions, opting for cheaper foods, asking friends to buy food outside and skipping meals. Food insecurity also wielded negative impacts on the students, spanning anxiety, fatigue, loss of concentration during lectures and feeling generally ill. The present finding suggests that the Ministry of Higher Education and universities should take a serious look into food insecurity among university students due to its adverse effects on their learning process and quality of life. Examples of the approaches that could be implemented are: discussing with the cafeteria operators in order to increase the availability of fruits and vegetables; organizing health campaigns which aim to reduce the use of excessive sugar, salt, and oil in food; providing financial aid for the students in dire need; and setting up the pantries that

provide free food for students. The students were advised to abandon their unhealthy coping strategies such as skipping meals. Last but not least, studies on food security issues among Malaysian university students are still scarce. More future studies with a larger sample size are recommended.

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