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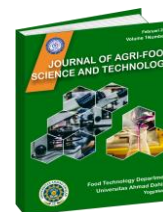
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An Online Survey of the Dietary Practices of Saudi Students in the UK: A Quantitative Study

Ali M. Abu Qurain¹, Fatimah A. Al Turki¹, Jason Hall¹, Hassan M. Alzain¹, Graeme Mitchell², Conan Leavey²

¹Environmental Protection, Health Protection Division, Environmental Health Unit, Al-Midra Tower, Dhahran 31311, Kingdom of Saudi Arabia

²Public Health Institute, Faculty of Health, Liverpool John Moores University, 3rd Floor, Exchange Station, Tithebarn Street, Liverpool L2 2QP, United Kingdom

Corresponding Author: ali.abuqurain@aramco.com

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ABSTRACT

There has been an abundance of research on the dietary practices of international university students in the United Kingdom (UK), as they comprise a significant proportion of the country's undergraduate population. However, there is a paucity in the literature with regard to the dietary practices, or other health behaviours, of Saudi students studying in the UK. Therefore, this empirical study sought to provide new insights to address this gap. This study contribution to investigate the dietary practices of Saudi students in the UK. The data was collected from a sample of 212 university students and encompassed an age range from 18 to 31+ years. A quantitative methodology was adopted in the form of an exploratory survey questionnaire. The sample was recruited through voluntary and snowball sampling techniques. Questionnaire data was analysed using Microsoft Excel and SPSS for Windows, version 26. The results demonstrated that various intrapersonal, interpersonal, and environmental factors play a significant role in developing eating behaviours and dietary choices. Some favourable changes in dietary practices were observed among Saudi students in the UK as opposed to Saudi Arabia, including a higher intake of fruit and vegetables, along with a lower intake of soft drinks, sugary and fatty foods. However, there was a notable reduction in consumption of all types of meat and fish as well as the total number of daily meals. Additionally, around a third of participants regularly consumed ready-to-eat food and takeaways 2-6 times a week. Interventions should therefore consider individual, societal and environmental factors.

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1. INTRODUCTION

Dietary behaviour can be defined as “normal behaviour related to eating habits, selecting foods that you eat; culinary preparations and quantities of ingestion” (Hernandez et

al., 2016). A balanced and healthy diet is widely acknowledged as a primary factor in preventing malnutrition, obesity and many chronic diseases such as cardiovascular diseases and type 2 diabetes. It can also help in sustaining the physical and mental health of individuals (Hilger et al., 2017). According to the World Health Organization (WHO), healthy diets should include high consumption of whole grains, fruits and vegetables, in addition to low consumption of salt, saturated fats and refined carbohydrates.

In contrast, unhealthy dietary behaviours, such as skipping meals and consuming nutrient deficient foods, can cause and exacerbate numerous health problems (Kabir et al., 2018). As reported by WHO, unhealthy diet is one of the major preventable risk factors for non-communicable diseases (NCDs) (e.g., cancers, diabetes and cardiovascular diseases), which are continue to be leading cause of chronic diseases, disabilities and deaths worldwide. It can also lead to a range of adverse physical changes in the youth, such as overweight, obesity and physiological hypertension, which can increase the risk of NCDs in adulthood (El-Kassas & Ziade, 2016).

Individuals' dietary habits are mostly developed during childhood and adolescence, and are likely to be established by both nurture (e.g., parental and peers influence) as well as nature (e.g., development of sensory perceptions) (Beasley et al., 2004). However, the changes and different circumstances throughout the life cycle are likely to influence individuals' lifestyle. An example of these changes is the change in diet that happen when students live independently or move to a different county or country to attend university. Those students leave behind the meals provided and cooked by their parents and learn to grocery shop, prepare and cook food for themselves. Such circumstances could predispose students to adopt unhealthy eating habits, which are likely to adversely affect their health and well-being. In addition, the lack of parental control could also lead to the adoption of unhealthy practices such as excessive alcohol consumption and smoking (Beasley et al., 2004). Such habits and behaviours may influence their intake of nutrition for decades, and may also increase the risk of weight gain and development of NCDs in the future.

University student populations are widely known to engage in unhealthy eating habits and behaviours such as high consumption of snacks and of convenience and fast foods, combined with insufficient consumption of fruit and vegetables (Tanton et al., 2015). There are various reasons that might lead students to engage in such behaviours. For instance, they might have insufficient knowledge of healthy food selections which could adversely impact their eating habits (Gan et al., 2011). Lack of finances might also contribute to unhealthy eating habits, as generally fats and sweets cost less compared to healthier food options. In addition, academic responsibilities can cause stress among students, which can lead to changes in eating behaviours. The nutritional environment in university can also contribute to students' eating behaviours. Students can buy and eat food at the university canteen during class breaks where fruits might not be readily available and food options might be limited (El Ansari et al., 2015). Their dietary behaviours could also be influenced by the changes in their living arrangements. For instance, Greek and Portuguese students who moved to Northern Europe encountered difficulties in maintaining their traditional Mediterranean diet (Lee & Loke, 2005; Vilela et al., 2014).

Several researchers have explored the dietary behaviours among male and female university students in Saudi Arabia, and almost all of them reported that students' dietary behaviours were unhealthy or unfavourable as students are not following the international guidelines on healthy diets (Al-Qahtani, 2016; Al Qauhiz, 2010; Alwosaifer et al., 2018; Khabaz et al., 2017; Majeed, 2015). One study was conducted to explore the dietary behaviours of Saudi Arabian adults (i.e., aged 18-65 years old) living in Saudi Arabia and in the UK in relation to heart disease risk (Al Moraie, 2014). The study concluded that there seems to be a high prevalence of cardiovascular disease (CVD) risk factors in Saudi adults. In addition, food

intake and CVD risk factors were statistically significantly associated for the whole study population. Another cross-cultural study explored the difference in weight status, obesity and patterns of physical activity among Saudi youths (i.e., 15-17 years) in Saudi Arabia and British youths in the UK (Al-Nakeeb et al., 2012). The findings of the study showed that gender as well as geographical locations appear to influence levels of physical activity and obesity among the youth. However, to the knowledge of the researcher, there is a paucity in the literature with regard to the dietary behaviours of Saudi university students in the UK.

Saudis who study in the UK experience a distinct culture different to their own, which is likely to influence their lifestyle patterns, including their physical status, mental and nutritional health. Acculturation and students' desire to integrate into the new host community may predispose them to modify their eating habits and patterns toward a more westernized food or mixed diet. The change in living arrangements, financial resources and social setting are major factors in maintaining eating habits. Availability of Halal food, which is sourced and prepared following the tenets of Islam, is also another major factor that can influence Saudi students' dietary intake. One of the commonly known phenomena among university students is known as "Freshman 15", which refers to the belief that students gain 15 lb (6.8 kg) in their first year of university (Vadeboncoeur et al., 2016). "Freshman 15" is highly associated with unfavourable dietary practices and is well recognized in domestic students (Cockman et al., 2013; Vadeboncoeur et al., 2016). However, there is not enough information in the literature regarding Saudi students in the UK regarding the Freshman 15 phenomena. Therefore, this study seeks to investigate the dietary practices of Saudi students in the UK.

2. METHODS

2.1. Study design

This research study aims to explore data on Saudi students' diet practices that can then be generalized to the wider Saudi student population in the UK. Thus, a quantitative methodological approach appeared to be the most suitable method to address the aforementioned research objectives.

Saudi students in the UK are a unique population that is hard to obtain information from by using qualitative methods such as interviews or focus groups. This is due to the fact that Saudi students in the UK are scattered and are hard to reach. Additionally, participants might be hesitant to some answer questions and share sensitive information (e.g., body weight) in a face-to-face meeting. Quantitative methods, especially online surveys, have proven an effective means of engaging reticent groups (Wright, 2006). Thus, this study implemented a survey design. Surveys can collect data from selected individuals at a single point in time. They are also useful to obtain a 'snapshot' of current attitudes, behaviours and beliefs in a population. They also have the advantage of providing data relatively quickly, making it possible to analyse and interpret the data in a timelier manner than with longitudinal studies.

2.2. Target population and sampling

Data was collected using online questionnaires as they are an effective method to collect data from large and dispersed samples. They are also very useful to collect data from distance learners (e.g., expatriate students). Voluntary sampling was adopted for this study. The questionnaire was put up on social media and distributed through gatekeepers such as academic advisors who work for the Saudi Scholarship Program. Snowball sampling was also used in this study. Formal, professional emails, yet friendly and laced with sincere gratitude, were sent to gatekeepers requesting them to share the link of the online questionnaire with Saudi students in the UK. The questionnaire was anonymous to encourage participation and assure accuracy and honesty in the responses given. The aim was to collect data from 100 participants, as in a similar successful study that investigated dietary patterns among Saudi university students,

(Khabaz et al., 2017) had close to this number of participants (i.e., 116 students). Participants must be Saudis who currently study in the UK.

2.3. Data collection

This study adopted a methodology that has been used successfully by many researchers to investigate dietary behaviours of students (Al-Nakeeb et al., 2012; El Ansari et al., 2015; Sprake et al., 2018). Online Surveys were used to design and host the questionnaires. Questionnaires were distributed via two social media sites, Facebook and Twitter, as both platforms are very popular among Saudi students. The usage of social media is increasing rapidly among young Saudi students. Facebook users reached 7.8 million in 2013 while twitter users reached 1.9 million. In addition, several studies have reported that both social media platforms are heavily used by Saudi university students for various reasons including communication with family and friends, entertainment as well as academic learning (Alghamdi & Plunkett, 2018; Alsuraihi et al., 2016). Questionnaires were also distributed through gatekeepers. Emails were sent to some of the academic advisors for Saudi Scholarship Programs requesting them to share the link of the questionnaire with Saudis who study in the UK.

In addition, an email was sent to the international society within Liverpool John Moores University (LJMU), asking the administrators to share the questionnaire on the society's Facebook and Twitter pages. This study used Volunteer and Snowball sampling methods to collect the data; wherein students who voluntarily participated in the study were asked to share the questionnaire with other Saudi students in the UK.

2.4. Validity and reliability

Validity is the extent to which a concept in a quantitative study is accurately measured, while reliability refers to the consistency of a measure (Heale & Twycross, 2015). Prior to data collection, to ensure that the survey was valid and reliable, it was piloted among a few Saudi students. In addition, it was reviewed and approved by two academic supervisors in Liverpool John Moores University. The data and feedback obtained illustrated that questions were easy to understand and respondents did not find them ambiguous or leading, asserting that the survey was valid and reliable. Post-data collection, the responses were similar, accurate and contextually relevant to the questions asked, which also proves the validity and reliability of the collected data. In addition, although the researcher meets the research criteria, he has not taken part by completing the survey to avoid any potential bias, and thus increase both validity and reliability of the results.

2.5. Research limitations

There are a number of possible limitations to this study. First, sample recruitment was done mainly through emails, Facebook and Twitter, which may not ensure that all participants met the inclusion criteria for this study. However, the researcher took some measures to prevent this issue by attaching a Participant Information Sheet (PIS) in all sent emails and providing a link to the PIS in the questionnaire. The PIS provides possible participants with sufficient information about the study (e.g., purpose, procedures and criteria. Gatekeepers who were contacted via emails, also received a Gatekeeper Information Sheet, which conveys sufficient knowledge about the study and explain their role. Additionally, the first question of the questionnaire was a screening question, in which it was asked whether the person was a Saudi student who currently study in the UK. A screening question either qualify or disqualify respondents to take part in the study, depending on their answer. Thus, only those who answered 'Yes', qualified to complete the questionnaire.

Another possible limitation is language barriers; as English is not the first language of

Saudis, it may have led some participants to misunderstand or misinterpret some questions in the survey. The researcher tried to accommodate this issue by using simple and plain language. Additionally, prior to data collection, the survey was piloted among some Saudi students to finalise question wording and address any other issues that may arise. Post data collection, the results showed that the response rate for the vast majority of questions was 100%, which indicated that the survey was comprehensible. Another conceivable drawback is participants' haste in the completion of the survey, for instance, aiming to finish in time for lunch, thereby compromising the quality of their responses. This was also accounted for by piloting the survey among Saudi students.

The uneven spread of participants is another limitation for this study. Male participants are almost double in number than their female counterparts, which can influence the results. This issue could have been mitigated if the survey was sent to Saudi female groups or societies in the UK (e.g., the women's committee in the Saudi Society in London). However, this difference has been taken into account when performing the statistical analysis of the data.

Self-selection bias is another possible limitation for this study, as studies that rely on self-selection of respondents are subject to this type of bias. It refers to the notion that individuals who might have a particular interest in the study's topic are more likely to participate than others (Jang & Vorderstrasse, 2019). It is particularly pertinent when it influences the collected responses; thereby reducing the generalizability of the studies outcomes (Sutton & Edlund, 2019). The BBC's Loneliness Experiment, the world's largest loneliness study, was also criticized of self-selection bias as it collected data via online surveys that relied on self-selecting samples, which gave the notion that people who felt lonely were more likely to participate (Wang et al., 2019). The potential bias for this study is that Saudi students who have a special interest in their health and diet might be more motivated to participate than others, and therefore, give a different picture that does not accurately represent the whole Saudi student population in the UK. Another potential limitation is the Snowball sampling technique that was employed in this study, as participants tend to share the survey with people that have similar traits and ideas as them (e.g., friends and family members), leading to a sampling bias. This can lead to outcomes that represent only this particular subgroup; thereby, affecting the generalizability of the study's findings to the wider population (Kirchherr & Charles, 2018). To enhance the diversity of participants and combat these limitations, the researcher has endeavoured to reach potential participants through multiple gatekeepers and various Facebook and Twitter pages.

There are other drawbacks that the researcher cannot control such as the possibility that participants have completed the survey more than once. As the survey was anonymous and did not ask for any identifiable information, other than age and gender, it was not possible to check for this issue. Moreover, since the survey is self-administrated, participants' bias may have occurred. Some participants may have altered their responses because they knew that they were being studied. This works in a similar manner to the 'Hawthorne Effect', where people change their behaviour during observational data because they know that they are being observed (Murdoch et al., 2020). However, this issue should have been minimized as the questionnaire is anonymous, and so the pressure to give socially desirable answers is reduced. Personal determinants also such as perceptions, beliefs as well as social and environmental factors may affect participants' dietary behaviours, thereby, influencing their responses. Furthermore, some contextual characteristics (e.g., size, location and local environment) might differ from that of other universities. Thus, the outcomes of this research might not be generalizable to other settings. Regardless, the aim of this study is to explore Saudi students' dietary practices that can then be generalized to the wider Saudi student population. It is noteworthy, also, that this research study is student-led, hence, the researcher could not gain access to certain academic websites and papers, which is another uncontrollable limitation.

2.6. Data analysis

Data analysis began once the data was collected. The researcher transferred the collected data from the survey instrument into SPSS in order to analyse it. SPSS, which is short for Statistical Package for the Social Sciences, is a widely used software for complex statistical data analysis. The software can produce basic descriptive statistics (e.g., averages, medians and frequencies) and perform advanced tests and analysis (e.g., multivariate analysis and time-series analysis). It is also capable of producing various visual representations of data such as graphs, tables and scatterplots (Arkkelin, 2014). The collected data was grouped by the respondent's gender as well as by level of study. Then, SPSS was used to obtain descriptive and inferential statistics for each group. SPSS and Microsoft Excel were also used to calculate averages, analyse and provide visual representations of the data. The obtained data was then used to answer the research question and objectives.

3. RESULT AND DISCUSSION

The survey has been answered by 212 university students, of which 121 were undergraduates and 91 were postgraduates. The participants comprised of 138 males (66.7%) and 69 females (33.3%) and encompassed an age range from 18 to 31+ years.

3.1. Daily foods/drinks

Participants were asked about the differences in their consumption of certain types of food/drinks between Saudi Arabia and the UK. Results indicated that students tend to consume more fruit and vegetables in the UK and less meat and fish and to a lesser extent sugars and fats. It was identified that more than 50% of participants reported that their fruit intake is higher and around 40% reported a higher intake of vegetables in the UK. Furthermore, results showed that around 47% of students when in Saudi consume less than 1 or perhaps 1-2 servings of fruit and vegetables but this increases to 3-4 servings when in the UK. The consumption of other types of food/drinks, including 'bread, cereals, rice, pasta, potatoes', 'unsalted nuts, beans, chickpeas, lentils', 'salt' and 'milk and dairy products' has generally remained the same among participants in both countries.

The findings of the present study identified some significant differences between students' intake of fruits and vegetables in Saudi Arabia (SA) and the UK. There is a notable increase in consumption of fruit and vegetables, along with a reduction in consumption of 'food/drinks containing sugar' and 'foods containing fat' in the UK. However, the results demonstrate a considerable reduction in the consumption of meat (all types) and fish among participants in the UK. This could be related to access and availability of Halal food, which is sourced and prepared following the tenets of Islam. This suggests that Islamic faith may influence students' dietary habits and food choices. Of interest, (Tanton et al., 2015) reported that riskier patterns of eating behaviours were observed in students of Christian faith. These findings assert that faith may influence students' dietary behaviours and practices. Overall, around a quarter of students reported that they consume 3 servings or more of fruits and vegetables per day in the UK compared to around 11% in SA. The Chi-square test indicated that this difference was statistically significant ($p= 0.002$). This trend shows that Saudi university students in the UK tend to consume more fruits and vegetables which contradicts a number of studies that found that the transition to university life has been associated with decreased intakes of fruit and vegetable (Alsunni & Badar, 2015; Beaudry et al., 2019; Papadaki et al., 2007; Tanton et al., 2015). However, the results are in accordance with other studies which have shown that the majority of university students do not meet the set guidelines for fruit and vegetable consumption (i.e., at least 5 servings per day) (AL-Otaibi, 2013; Mello Rodrigues et al., 2019; van den Bogerd et al., 2019).

Results also demonstrated that the majority (66%) of participants reported that their snacks in Saudi Arabia consist mainly of ‘sweets/chocolate/ice-cream/cakes’ and ‘Biscuits/crackers/bread/stick bread’. Nevertheless, in the UK, the most preferred type of snack among students was ‘fruit/fruit juice/ fruit and milk shakes/yogurt’ (59%), followed by ‘biscuits/crackers/bread/stick bread’ and ‘sweets/chocolate/ice cream/cakes’. The number of students who drink ‘mineral water’ and ‘fruit juice/fruit and milk shakes’ with their meals in the UK has increased by 22% in comparison to Saudi Arabia. Additionally, the number of students who consume soft drinks with their meals in the UK decreases to 28% as opposed to 36% in Saudi Arabia, while the number of those drinking tea/coffee has not changed.

This study also showed that the majority of students in the UK lean toward healthier snack options which may be explained by the higher consumption of fruits and vegetables in the UK as opposed to Saudi Arabia. Similarly, another healthier dietary behaviour among Saudi students in the UK was observed by increasing the number of students who drink ‘mineral water’ and ‘fruit juice/fruit and milk shakes’ with their meals in the UK in comparison to Saudi Arabia and decreasing the numbers of students who consume soft drinks with their meals in the UK.

3.2. Number of meals

In Saudi Arabia, around a third of participants consume 1-2 meals per day, while the majority consume 3-4 meals per day (59.05%). However, in the UK, the number of those consuming 1-2 meals per day almost doubled (68.10%) while the number of those consuming 3-4 meals per day dropped to around half of that of Saudi Arabia. Generally, minor differences were observed for number of breakfast meals intake between Saudi Arabia and the UK throughout the week. However, compared to Saudi Arabia, daily intake of lunch and dinner in the UK dropped by around 20% and 19%, respectively. In addition, the number of students who reported that they ‘less often’ or ‘never’ consume lunch and dinner in the UK increased by around 9% and 12%, respectively.

Additionally, in concordance with the literature, the findings illustrated that the vast majority of students are likely to skip meals; and in particular, many skipped lunch and dinner. Several international studies conducted in Malaysia, Nigeria, Bangladesh, Saudi Arabia and Turkey provided evidence that university students skipped meals due to numerous personal, societal and environmental factors (Gan et al., 2011; Kabir et al., 2018; Mirghani et al., 2019; Neslişah & Emine, 2011). The results showed considerable differences between the number of daily meals consumed by participants in SA as opposed to the UK ($p=0.003$). This attests that Saudi students in the UK are likely to skip meals, which is in line with the findings of the previously discussed studies. Additional explanation for this trend was observed by Kabir et al., (2018) who reported that university students in Bangladesh skipped or substituted meals for light snacks (e.g., biscuits, dry cake, tea, and coffee) due to various reasons, including time constraints and academic pressure (e.g. exams, tutorials and assignments). Another study that included more than 40 universities across Germany reported that academic pressure limited the time available for cooking, leading to unhealthy eating behaviours among students (Hilger et al., 2017). Stressful conditions are positively associated with the consumption of higher amounts of unhealthy food (e.g., energy drinks, soda, coffee, fast food and salty snacks) among university students as observed by (Errisuriz et al., 2016). Additionally, academic pressure along with environmental and university-related factors have been also associated with the type of snacks consumed by university students in the university of Newcastle, Australia (Hsieh, 2004).

3.3. Consumption of ready to eat food

The survey also studied the frequency of consumption of ready-to-eat food and

takeaways among both male and female student during their 1st, 2nd & 3rd year of study from three groups of food outlets including; fast food outlets, University canteen, and Coffee shops, vending machines or supermarkets. Overall, the results showed similar trend regarding students' behaviours in their first, second and third year of study, as around a third of participants regularly consume ready-to-eat food and takeaways from 2-6 times a week. There was no distinguished difference in the frequency of consumption of ready-to-eat food and takeaways from different food outlets between both male and female students were similar.

In respect to consumption of ready-to-eat food and takeaways the results showed insignificant difference between the consumption of ready-to-eat food and takeaways, from the three groups of food outlets among male and female participants during their first year of study ($p=0.669$, $p=0.235$ and $p=0.138$). The analysis showed insignificant differences between the consumption of ready-to-eat food and takeaways from fast-food outlets and university canteen among male and female participants during their second and third year of study ($p=0.678$, $p=0.485$). However, significant differences were observed for the consumption of ready-to-eat food from coffee shops, vending machines or supermarkets ($p=0.017$), with higher number of males (107) than females (48). Overall, the results showed insignificant differences regarding students' behaviours in their first, second and third year of study as around a third of participants regularly consume ready-to-eat food and takeaways from 2-6 times a week. Ready-to-eat food and takeaways are often energy dense and contain higher levels of salt, sugar and fat. In addition, consumption of ready-to-eat food and takeaways is associated with lower micronutrient intake and higher levels of subsequent excess weight gain and obesity (Goffe et al., 2018; Hillier-Brown et al., 2017). Hence, participants who regularly consume ready-to-eat food and takeaways from 2-6 times a week are more prone to gain weight compared to the other participants in the study.

3.4. Food shopping, preparation and consumption

Around 59% of male students reported that they like food cooking while only 46% of female participates neither like nor dislike food cooking. However, minor differences in terms of preference for food shopping were observed among male and female participants. On average of 36.72% of participants male and female reported that they like food shopping. Participants were also asked about the top 3 most important factors for them when buying food. In Saudi Arabia, 'quality or freshness of food' was the top factor (79%), followed by 'taste' and 'foods I know how to cook/prepare' which were rated to 59.5% and 47.1%, respectively. In the UK however, 'price' (61.1%) was the most important factor, followed by 'quality or freshness of food' and 'Halal food' which were rated to 58.8% and 54.5%, respectively.

The majority of students (85%) reported that they prepare and eat food as a part of a group in Saudi Arabia. In the UK however, the majority (60%) reported that they prepare and eat food individually. The analysis demonstrated that the association between students' living arrangements in the UK and the way they prepare and eat food is statistically significant ($p=0.000$). The majority of students who live with their families, partners or other students tend to eat as a part of a group. On the other hand, the majority of those who live on their own prepare and consume meals individually.

The analysis has revealed that the difference between genders in term of their preference to food cooking was statistically significant ($p=0.012$), with considerably higher number of males (137) who like food cooking than females (69). However, the statistical analysis demonstrated that the difference between genders in respect to food shopping is statistically insignificant ($p=0.571$). The majority of male and female students reported that they prepare and eat food as a part of a group in SA ($p=0.609$). In the UK however, the majority of students prepare and eat food individually ($p=0.032$). The analysis demonstrated that the association between students' living arrangements in the UK and the way they prepare and eat food is

statistically significant ($p= 0.000$). The majority of students who live with their families, partners or other students tend to eat as a part of a group. On the other hand, the majority of those who live on their own prepare and consume meals individually.

On average all groups of students gained weight regardless of their cooking preferences during their first year of study in the UK. However, students who reported that they really dislike cooking gained 10 KG during their first year in the UK which is 2.5 times greater than other students who like cooking.

One of the commonly known phenomena among university students is known as “Freshman 15”, which refers to the belief that students gain 15 lb (6.8 kg) in their first year of university (Vadeboncoeur, Foster and Townsend, 2015). “Freshman 15” is highly associated with unfavourable dietary practices and is well recognized in domestic students (Cockman et al., 2013; Vadeboncoeur et al., 2016). The results in the present study showed that 29% of the total participants (i.e., 52 students) have gained on average 10 kg during their first year of study in the UK. This shows that a considerable number of Saudi students have fallen victim to the Freshman 15 phenomenon. The ANOVA analysis demonstrated insignificant associations between gender ($p= 0.449$), number of meals ($p= 0.728$), living arrangements ($p= 0.297$) and weight gain. However, it showed a strong and significant correlation between students who really disliked food cooking and Freshman 15 ($p= 0.029$). On average all groups of students gained weight regardless of their cooking preferences. However, students who reported that they really dislike cooking gained significantly more weight than others (i.e., 10kg) during their first year of study, while those who disliked food cooking have gained 5Kg. In order to better understand the underlying reasons for such a notable weight gain, students were asked about the possible barriers to healthy eating in the UK.

3.5. Barriers to healthy eating

Students were asked about the potential barriers to healthy eating among Saudi students in the UK. The responses revealed that students’ eating habits have been influenced by a wide spectrum of factors, which may have contributed to poor nutritional intake among them. As shown in Table 1 below, a range of intrapersonal, interpersonal, and environmental factors influence Saudis’ eating behaviours and food choices. Time constraint was the biggest factor (35.77%) affecting the healthy eating as reported by participants.

Participants were also asked about the potential barriers to healthy eating while they were in Saudi Arabia. Various social, cultural and environmental factors influence Saudis’ eating habits. Respondents reported that the socializing with their friends and families (17.65%), along with relatively low costs for unhealthy foods (11.76%) and lack of access to healthy food options (12.61%) where the top reported barriers prevent them from maintaining healthy diets.

The responses revealed that students’ eating habits have been influenced by a wide spectrum of factors, which may have contributed to poor nutritional intake among them. Lack of time, knowledge of healthy foods, cooking skills, motivation, costs, habituation to certain dietary intakes, culture, access to Halal food and healthy food options were the key reported barriers to healthy eating behaviour among Saudi students in the UK. Lack of time to cook/prepare healthy foods was the most commonly reported barrier to healthy eating, followed by ‘knowledge and skills’, ‘habits and convenience’ and ‘cost’, respectively. These results are generally in agreement with several studies and are perceived to be interconnected and influence each other (Escoto et al., 2012; Hilger et al., 2017; Kabir et al., 2018; Majeed, 2015; Sogari et al., 2018). Many students stated that they were hampered by lack of time and “it is easier to buy food from restaurants”. This can influence students to be more prone to consume commercially prepared food from restaurants, coffee shops and other commercial food vendors. Along with time constraints, limited access to healthy food options and lack of

motivation and cooking skills considerably limits the likelihood of meal frequency and increase reliance on takeaways, which are evident by the existing study. In addition, 5.84% of participants cited that access to Halal food was a major barrier that prevented them from following a healthy diet, which may explain the notable reduction in the consumption of meat and fish among Saudi students in the UK. Participants also reported that lack of knowledge regarding healthy food options played a role in developing unhealthy eating habits. This is concordant with the findings of (Hu et al., 2016) who observed that university students in China who had poor knowledge of healthy diets developed a greater tendency to eat out.

Table 1. Barrier to healthy eating among Saudi Students

Barrier	% of participants	
	In Saudi Arabia	In the UK
Time Constraint	6.72%	35.77%
Knowledge and skills	7.56%	13.87%
Habits and convenience	10.08%	13.14%
Cost	11.76%	10.22%
Culture and tradition	10.06%	6.57%
Access to Halal food	-	5.84%
Availability of restaurants	10.92%	-
Access to healthy food options	12.61%	5.11%
Motivation	8.40%	3.65%
Socialising/ Eating out	17.65%	-
No barriers	4.20%	5.84%

Students were also asked about the potential barriers to healthy eating in SA. The analysis suggested that various social, cultural and environmental factors influence Saudis' eating behaviours and food choices. Respondents reported that the widespread availability of good restaurants in SA along with lots of Saudis being in big friendship groups have created a culture of eating out. The majority of respondents stated that they like to socialize with their friends and families, consequently, eating out became a convenient and social. One respondent stated that, "it's much easier to overeat as everyone does so. There's also a lot of peer/familial pressure to "finish" food rather than put it in the fridge". Another one stated that, "hanging out with friends usually means meeting up in a restaurant". In addition, availability of good restaurants, public festivals and family gatherings hampered them from maintaining healthy eating habits. This shows that Saudis' food choices are clearly influenced by their social network (e.g., friends and family members), which is supported by several studies. For instance, Contento et al., (2006) observed that adolescent food selection, practices, attitudes, behaviours and preferences are influenced by their peers. Another study reported that socio-environmental factors (e.g., friends and peers) affect eating patterns. In addition, Schnettler et al., (2017) observed that family eating patterns were influential in food selection among university students in southern Chile. Existing social norms (e.g., a culture of eating out) are also perceived to have a salient influence on eating behaviours and food selections (Kabir et al., 2018). Additionally, "takeaways are easier as many ways of ordering now exist (apps and calls)" and "fast food is actually cheap". Overall, the results demonstrate that various social, cultural and environmental factors influence Saudis eating behaviours in SA. Some of which (e.g., lack of knowledge and skills and habits of eating out) may considerably influence their dietary practices when studying in the UK.

4. CONCLUSIONS

This study investigated the dietary practices and behaviours of Saudi students currently studying in the UK. It provided an insight into a previously unstudied cohort of university students in the UK and revealed that their experiences and needs may vary from other international student groups. The dietary analysis showed that a wide range of intrapersonal, interpersonal, and environmental factors play a salient role in developing eating behaviours and dietary choices. Interpersonal factors such as knowledge and perceptions of healthy food choices, cooking skills, and family eating habits were found to be influential in the development of eating habits. In conjunction with these individual aspects, various societal and environmental factors, including academic pressure, peer influence, food costs and availability exerted also an influence on eating behaviours. The findings illustrated some favourable changes in dietary practices in the UK, such as higher intake of fruit and vegetables, along with lower intake of soft drinks, sugary and fatty foods. However, there was a notable reduction in consumption of all types of meat and fish as well as the total number of daily meals. Additionally, around a third of participants regularly consumed ready-to-eat food and takeaways 2-6 times a week. Universities have a policy of wanting to encourage healthy behaviours, and minimize unhealthy behaviours, and this applies to diet. Saudi students face potentially unique barriers to eating healthy and universities have a responsibility to try to help them address these. Interventions should therefore consider individual, societal and environmental factors to increase healthy eating habits and improve dietary practices among this group of university students.

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