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Exploration of changes in health-related behaviours among Saudi Arabian undergraduates in the United Kingdom

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ABSTRACT

This project is an exploratory survey of the ways in which living in the UK has affected the health-related behaviours of Saudi Arabian undergraduate students. The study identifies changes in exercise behaviours, dietary and smoking habits and experiences of stress after their move to the UK. In addition, it identifies what the students perceive to be the drivers of these changes. To achieve this, an online questionnaire was developed collecting quantitative data. This was distributed via Facebook groups specifically for Saudi students in the UK. The results demonstrate that a majority of Saudi Arabian undergraduates felt that their behaviours had become healthier since their move to the UK, mainly as a result of a more active lifestyle, derived from reduced reliance on cars, increased daily walking, and a heightened focus on health promoted by their independence, the availability of healthy foods and exposure to a more health-promoting culture.

Although these results are based on a relatively small sample, they are surprising since they contradict previous studies on international students, which have generally found negative lifestyle changes during their studies, including increased stress, poorer dietary habits and a decline in physical activity. Although the exploratory nature of the study means that concrete recommendations cannot be made, it nonetheless offers an impetus for further research into how Saudi Arabian students may be encouraged to adopt healthier lifestyles while studying in the UK.

Key Words:

International students, Saudi Arabia, UK, lifestyle, health, study abroad, physical activity,
diet, smoking, stress.

Abstract word count: 230

INTRODUCTION

According to the UK Higher Education Statistical Agency (HESA, 2020), 7950 students from Saudi Arabia were enrolled on programmes across all levels at UK universities in 2017, making Saudi Arabia the seventh largest provider of international students in the UK. Previous research (Alhazmi & Nyland, 2012; Alzayani, 2013; Alyami, 2015) that has considered Middle Eastern students studying abroad has tended to focus on their mental health and the potential culture shock they experience, rather than their physical health. One area that has sorely lacked attention from a public health perspective is the issue of lifestyle (and lifestyle changes) among Saudi students in the UK.

Health systems worldwide have begun to focus more attention on the links between poor health-related behaviours embedded in people's lifestyles (such as lack of exercise, poor diet, smoking, consumption of alcohol, etc.) and the incidence of non-communicable diseases, such as obesity, heart disease and cancers (Glanz, 2017). It is estimated that, in the UK, if it were possible to remove all unhealthy behaviours, the life expectancy of the most disadvantaged could be increased by more than ten years (Bunker, 2001; Swann et al., 2010). A further significant consideration is the potential to reduce the very significant healthcare costs associated with the treatment of non-communicable diseases (Swann et al., 2010).

In the above context, it is significant that the incidence of non-communicable diseases is rising dramatically across virtually all sections of Saudi society (Al-Hazzaa, 2004; Al-Hazzaa, 2007; Al-Othaimen et al., 2007). There is significant and growing evidence that this increase is linked to low levels of physical activity and poor diets among Saudi young people (Washi & Ageib, 2010; Finlayson et al., 2012; Peltzer et al., 2014).

Overall, Al-Nakeeb et al. (2012) found that Saudi Arabian adolescents had significantly poorer health-related behaviours than their counterparts in the UK. Saudi Arabian teenagers had higher BMIs, lower rates of physical activity and higher rates of sedentary behaviour at statistically

significant levels, and were therefore at higher risk of non-communicable diseases. The authors suggest that the lower rates of physical activity in Saudi Arabia are potentially a result of the desert climate and a lack of outdoor facilities in the country.

This evidence suggests that, in general, young Saudis engage in negative health behaviours, although it does not highlight whether this is more applicable to those young Saudis who become international students than those who do not. Regardless of this, the question of what then happens to Saudi students once they travel to the UK is not widely asked or understood. On the one hand, it might be implied that these international students may experience potential drivers for increases in physical activity and a less sedentary lifestyle in the UK. On the other hand, such evidence as there is from related populations tends to question this assumption. Alzayani (2013) discovered that Middle Eastern students at a New England University recorded increased weight gain and a lack of physical activity, outcomes that were attributed to a number of factors, including: lack of familiarity with the cold temperatures they experienced, which restricted their time outdoors; the stressful and time-consuming nature of their studies; the lack of availability of Middle Eastern foods and ingredients and the easy availability of fast foods. Indeed, these findings are in line with a wide range of research on the general student experience, which finds that students from all backgrounds are likely to experience weight gain from poor diet and low levels of physical activity whilst at university (Cluskey & Grobe, 2009; Lloyd-Richardson et al., 2009; Finlayson et al., 2012).

In general, therefore, the literature on related questions and populations would tend to suggest that Saudi students who arrive in Western countries to study are likely to experience negative lifestyle and health-related behaviour changes. Set against that, however, studies have also shown that there are significant deviations in the levels of physical activity undertaken by international students from different countries, and so it is not possible to make the above assumption uncritically (Bergier, 2015).

Two final issues that are worth noting are, firstly, that much of the current research has been conducted with postgraduate rather than undergraduate students (Alzayani, 2013; Lefdahl-Davis & Perrone-McGovern, 2015), or simply does not identify the level of study of the respondents (e.g. Alhazmi & Nyland, 2012; Heyn, 2013). Postgraduate students are at a different stage in their lives and have already completed an undergraduate degree, possibly outside of Saudi Arabia. Furthermore, there are potentially different pressures on undergraduate students than on postgraduates, particularly those doing research degrees. Secondly, although previous research has identified that the culture shock of studying in the West is particularly severe for female Saudis (Lefdahl-Davis & Perrone-McGovern, 2015) there has not hitherto been much research into whether this leads to different behavioural changes in female students compared to male ones. A study that focuses exclusively on undergraduate students in the UK, and that also considers gender differences, would therefore be beneficial to fill these gaps.

Consequently, this paper reports an initial exploratory study that focuses on the health-related behaviours of Saudi undergraduate students in the UK and how their move to the UK has affected these behaviours.

METHOD

Study design

The research utilised an online questionnaire as its data collection method. This was specifically designed for this purpose since a review of the literature did not find an existing and appropriate validated tool. The full version of this questionnaire is available as supplementary material.

Comprising 36 questions, the questionnaire focused on establishing the level of change in health behaviours of the respondents. Twenty-nine closed questions asked respondents to compare their health behaviours in Saudi Arabia with those since they commenced their studies in the UK. In addition, respondents were asked seven open questions, which allowed them to elaborate on reasons for any changes in their health behaviours. The lifestyle-related health behaviours surveyed were smoking, physical activity, healthy eating and weight. These were chosen based on the previous studies surveyed in the Introduction section (Washi & Ageib, 2010; Al-Nakeeb et al., 2012; Finlayson et al., 2012; Peltzer et al., 2014). We also surveyed experiences of stress since these are known to be issues among Saudi students studying abroad, and to be related to overall health and well-being (Alhazmi & Nyland, 2012; Alzayani, 2013; Alyami, 2015). Finally, we asked about the respondents' perceptions of the overall changes in their health-related lifestyle.

Target population and sampling

The target population was defined as Saudi Arabian nationals who were studying on a full-time undergraduate degree in a UK university. This comprised 2835 students (HESA, 2020).

The questionnaire was posted to five Facebook pages dedicated to Saudi students studying in the UK. Facebook was identified as the most appropriate social media platform, given its ubiquitous nature and ability to reach the target population. There are 15 million Facebook users in Saudi Arabia (Kemp, 2020), and focusing on pages dedicated to Saudi students in the UK gave us confidence that we were addressing our target population. A prerequisite for completing the survey was respondent affirmation that they were currently an undergraduate student in the UK.

The selected groups were similar in nature and the recruitment process identical for all of them—an explanatory post and link to the questionnaire were provided and users invited to participate. Whilst it must be acknowledged that an individual could be a member of multiple pages, it is unlikely that respondents would provide repeat responses from different Facebook pages. The use of social media platforms is not without its issues—it excludes potential respondents without access to that platform, thus potentially leading to a sampling bias (Ross, 2012). Moreover, internet-based sampling techniques suffer from non-response issues, with often only a small proportion of those who see the survey completing it (Daniel, 2015), leading to low response rates which could reduce the reliability and representativeness of a study (Ross, 2012).

Prior to posting the questionnaire online, it was piloted by emailing it to a small group of Saudi undergraduate students currently studying in the UK, who were asked to identify any areas of ambiguity. Feedback from the pilot study was positive and no amendments to the questionnaire were required.

Data Analysis

In order to present our overall results succinctly and clearly, Table 1 presents descriptive statistics illustrating the overall changes in behaviour in each of the six categories. These were prepared in Microsoft Excel. Since we were also interested in whether these overall changes in behaviour could be related to other factors, we also undertook some inferential statistical analyses. For smoking, physical activity, stress and weight, we were interested in whether changes in behaviour in the UK varied between male and female students, which we analysed using Pearson's Chi Squared Test (conducted in SPSS). In respect to food and diet, the descriptive statistics revealed a broad balance between participants who believed that their behaviour had changed positively and those who believed it had changed negatively. We

therefore analysed their responses to questions about a wide range of specific behaviours in more detail. For this we used McNemar's Q test. For the sake of brevity we do not attempt to combine this with an analysis of gender. While we accept that analysis of whether such changes varied according to gender may add depth to the analysis we leave this to future work devoted specifically to diet. For all analyses a p value of $p < 0.05$ was taken to indicate statistical significance. Free text responses to open questions were collated thematically and were used to add richness to the statistical analyses.

RESULTS

The questionnaire generated 212 responses, of which 67% (n=143) were from males and 33% (n=69) from females. With the exception of the section on food and diet, the sections below present the data on (1) the proportion of respondents overall who were engaged/not engaged in the health related behaviour; (2) whether the behaviour started in Saudi Arabia or in the UK, and whether the frequency changed; (3) whether these changes in behaviour differed according to gender; (4) any relevant quantitative or qualitative data from the questionnaire as to reasons for changes in behaviour.

Table 1 introduces the results by providing a summary of the overall changes in health behaviour. In that table, a positive change reflects a reduction in unhealthy behaviours or outcomes, or an increase in healthy behaviours or outcomes (so, reduced smoking and stress, increased physical activity and healthy eating). While these summarised descriptive statistics provide a convenient and easily-accessible summary of our more complex findings, it is recognised that they necessarily elide potential ambiguity in respect to some behaviours / outcomes. So, changes in weight, for example, do not necessarily fall straightforwardly into positive or negative categories (weight gain may be a positive development for some individuals). Where relevant, such ambiguities are explored further in the discussion section.

[Table 1: Summary of changes in health behaviours]

Smoking

Of the 212 respondents, 16% (n=34) said that they smoked cigarettes, with 59% of those (n=20) having started smoking in Saudi Arabia. Of those 20, eight smoked more in the UK, five smoked less and seven smoked the same amount. Since 14 respondents started smoking in the UK, a total of 22 of the overall sample of 212 (10.4%) smoked more in the UK, five (2.4%) smoked less and 185 (87.3%) stayed the same (i.e. either not smoking or smoking the same amount as before).

In respect to gender differences, male smokers (n=29) represented 20.1% of the overall sample. Of these, 58.6% (n=17) started smoking in Saudi Arabia and 41.4% (n=12) started in the UK. Female smokers, meanwhile, represented 7.2% (n=5) of the sample. Of these, 60% (n=3) started smoking in Saudi Arabia and 40% (n=2) started in the UK.

For the alternative hypothesis that there is a difference in when respondents started smoking between male and female students, the Chi Squared Test generated $\chi^2=0.0033$ and $p=0.954$. The differences between male and female respondents in terms of when they started smoking are therefore not statistically significant.

Physical Activity

Of the 212 respondents, 74.1% (n=155) said they took regular exercise and 25.9% (n=57) did not take regular exercise.

For respondents who stated they took regular exercise, 63.9% (n=99) started exercising in Saudi Arabia and 36.1% (n=56) started exercising in the UK. Furthermore, 67% (n=104) reported an increase in physical activity in the UK, while 20% (n=31) reported a decrease in physical activity and 13% (n=20) reported no change.

71.6% (n=111) of those who undertook regular exercise were male and 28.4% (n=44) were female. For male respondents 63.1% (n= 70) started regular exercise in Saudi Arabia and 36.9% (n=41) started in the UK. For female respondents 65.9% (n= 29) started regular exercise in Saudi Arabia and 34.1% (n=15) started in the UK.

For the alternative hypothesis that there is a difference in when respondents started regular exercise between male and female students, the Chi Squared Test generated $\chi^2=0.1106$ and $p=0.739$. The differences between male and female respondents in terms of when they started exercise are therefore not statistically significant.

137 of the 155 responses cited walking as a significant form of exercise in the UK (an increase from 98 who said they walked regularly in Saudi Arabia). An additional and related finding was the increased focus on fitness and making healthy choices, which was highlighted by a large proportion of the free text responses as being a result of their move to the UK. Other respondents made general remarks about the “lifestyle” and “atmosphere” in the UK that encouraged them to increase their levels of physical activity in order to be healthier.

Food and Diet

Of the 212 respondents, 45.35 (n=96) said their eating habits had become healthier; 14.6% (n=31) said they had remained the same and 40.1% (n=85) that they had become less healthy.

Whereas the descriptive statistics for the other five investigated categories showed a clear outcome in terms of respondents’ perception of whether their behaviour had changed positively or negatively, this category revealed a more balanced result. To investigate this more closely we went on to ask detailed questions about the frequency of consumption of various food groups and use of cooking methods while in Saudi Arabia, and then in the UK. We analysed these responses using McNemar’s Q test for paired nominal data. The results are summarised in Table 2:

[Table 2: Change in eating and cooking behaviours between Saudi Arabia (KSA) and the UK]

The most striking changes were that respondents in general consumed meat and fish, and rice, very significantly less frequently in the UK compared to Saudi Arabia ($p < 0.001$), but consumed fast food significantly more frequently. In addition, respondents used conventional ovens for their cooking significantly less frequently, but microwave ovens significantly more frequently.

Respondents were asked to provide reasons in free text responses for the perceived change in their diets. Those that felt that their diet had become less healthy as a result of their move to the UK most commonly stated that they ate more junk food as a result of a lack of cooking skills and having no time to cook. The participants who stated that they felt that their diets had become healthier since their move to the UK stated that independence from their families gave them the ability to cook and eat the foods that they wanted, and to reject unhealthy foods that their families would have cooked for them. A second reason offered by the participants for healthier dietary choices in the UK was that healthy foods were more available to them in the UK than in Saudi Arabia.

Stress

Although, the proportion of participants who were stressed often (51.9%, $n=110$) was evenly split with those who were not (48.1%, $n=102$), females were very significantly more likely than males to report feeling stressed often (66% compared to 44%, $\chi^2=8.951$, $p=0.003$).

Furthermore, a clear majority of the respondents (55.7% $n=118$) reported that their stress levels had increased after coming to the UK (29.2%, $n=62$, said stress levels had stayed the same, while 15.1%, $n=32$, said they had decreased). Here, however, there was no statistically significant difference between the sexes. Specifically, 53.1% ($n=76$) of the male respondents reported increased stress levels in the UK (32.9%, $n=47$ reported staying the same and 14%

reported a decrease), while 60.9% (n=42) of the female respondents reported an increase, 21.7% (n=15) reported the same level and 17.4% (n=12) a decrease. Thus, for the alternative hypothesis that there is a difference between male and female students in terms of the changing levels of stress while studying in the UK, Chi Squared Test generated $\chi^2=2.827$ and $p=0.243$. The differences in how levels of stress changed between male and female students while studying in the UK were therefore not statistically significant.

For the 170 respondents who responded to a question asking for the causes of stress, some clear areas appeared; 56.7% (n=98) identified their studies as a factor; 19.3% (n=33) increased responsibility; 11.5% (n=20) indicated homesickness and 11.5% (n=20) indicated the change in culture as a factor.

Weight

Of the 212 respondents, 45.8% (n=97) stated their weight had reduced whilst in the UK; 22.2% (n=47) reported a weight gain and 32% (n=68) indicated they had neither gained nor lost weight. When weight change was analysed according to gender no statistically significant difference was found ($\chi^2=0.239$ and $p=0.625$)

Healthy lifestyle

Of the 212 respondents, 55.2% (n=117) indicated that they felt that overall their lifestyle had become healthier since coming to the UK; 26.4% (n=56) indicated that they felt that their lifestyle was less healthy and 18.4% (n=39) reported that they felt there was no change in terms of their lifestyle.

For male respondents 53.8% (n=77) felt their lifestyle was healthier; 17.5% (n=25) felt it had remained the same and 28.7% (n=41) felt it had become worse.

For female respondents 58% (n=40) felt their lifestyle was healthier; 20.3% (n=14) felt it had remained the same and 21.1% (n=15) felt it had become worse.

For the alternative hypothesis that there is a difference between male and female students in the perception of having a healthier lifestyle while studying in the UK, Chi Squared Test generated $\chi^2=0.957$ and $p=0.328$. The differences in male and female students' perceptions of having a healthier lifestyle while studying in the UK were therefore not statistically significant.

For those respondents who reported leading a more healthy lifestyle, 45.3% (n=53) cited a more health-promoting culture in the UK, 40.2% (n=47) cited a decrease in their stress levels and 24.8% (n=29) cited an increase in exercise.

For those respondents who reported leading a less healthy lifestyle, 85.7% (n=48) indicated that stress was a factor in this and 96% (n=54) indicated that fast food consumption was also a factor.

DISCUSSION

Smoking

Only a small proportion of respondents smoked regularly and 59% of these smoked before they arrived in the UK. The ratio of male smokers to non-smokers, at 20% of respondents, is consistent with both the UK and Saudi Arabian national averages. The female respondents were rather more likely to smoke than the average among Saudi Arabian women (5% in our sample compared to 1.1% in Saudi Arabia), but this was still much lower than the 17% of UK women who smoke (Moradi-Lakesh et al., 2015; Office for National Statistics 2016). Although it might be thought that quite a high proportion of the smokers in the sample (40%) started after their

arrival in the UK, the sample of active smokers in our study is too small to draw robust conclusions.

Physical Activity

One of the clearest results was the increase in levels of exercise noted by the respondents, with this increase being consistent for both males and females. The significant increase in walking noted in the quantitative results is an important finding, especially when interpreted alongside the free text responses, which cited the influence of societal norms in the UK, especially the reduced reliance on cars. This is supported by previous research on the sedentary lifestyles of young people in Saudi Arabia, which has highlighted a reliance on cars as a mode of transport (Al-Fouzan, 2012; Al-Nakeeb et al. 2012).

There is a significant amount of evidence that the environment influences rates of physical activity, and the implication of the qualitative results is that the built and social environments are more conducive to walking in the UK than Saudi Arabia (Saelens & Handy, 2008; McCormack & Shiell, 2011). The built environment here refers to the availability of pavements, crossings and facilities for pedestrians to facilitate and encourage walking as an everyday activity (Goodman & Tolley 2003). In contrast, the built environment and pedestrian infrastructure of Saudi Arabia do not encourage walking (Bahammam, 1995; Al-Fouzan, 2012).

This result also highlights a potential difference between the experiences of Saudi undergraduate and postgraduate international students. Many of the previous studies on Saudi and Middle Eastern international students in the West have used postgraduate respondents, and have tended to show that levels of physical activity fall because of how time consuming postgraduate studies are (Alzayani, 2013). Furthermore, these studies were carried out in the US, whose car-focused culture is more similar to that of Saudi Arabia than the UK

(Transportation Research Board, 2005). These results suggest that there are UK-specific social and environmental factors that encourage engagement in physical activity by Saudi undergraduate students (specifically) that have not yet been thoroughly assessed. Additional qualitative and quantitative research is needed to understand what precise social and environmental factors Saudi undergraduate students identify as influencing their physical activity when in the UK, compared to when in Saudi Arabia.

Food and Diet

Although the respondents' overall assessments of the changes in their diet between Saudi Arabia and the UK were relatively evenly split between those who felt that it had become healthier and those who felt it had become less healthy, responses to more specific questions suggested that Saudi students adopted a somewhat less healthy diet when in the UK. The data revealed that while consumption of snacks (in general) did not vary significantly between the two countries, consumption of fast food increased significantly in the UK, while that of meat, chicken, fish and rice decreased very significantly. This data needs to be interpreted alongside the data on food preparation techniques, which showed a significant decrease in the use of conventional ovens and (an almost parallel) significant increase in the use of microwave ovens.

Taken together, therefore, the quantitative data seems to support an inference that Saudi students in the UK are less likely to engage in "proper" cooking (or at least eating home-prepared food) and are instead more likely to be heating ready meals in a microwave or consuming fast food. The free text responses also support this inference from the data, and such a conclusion would be in line with the results found by a large number of studies on the eating habits of international students and undergraduate students in general (Alzayani, 2013; Cahill & Stavrianeas, 2013; Loomes & Croft, 2013; O'Sullivan & Amirabdollahian, 2016).

The picture is not clear cut, however. 45% of respondents did feel that their diets had become healthier since their move to the UK. It is interesting that the free text data from these respondents focused on their increased independence in the UK and the ability to access healthy foods more easily, both practically, and due to cultural differences (such as the lack of family gatherings). Although most undergraduate students are experiencing independent living for the first time, the scholarship on Middle Eastern students does identify independence as a particular issue for those students, particularly in terms of difficulties in cultural adjustment and increased stress (e.g. Alhazmi & Nyland, 2012; Lefdahl-Davis & Perrone-McGovern, 2015). Our results, however, hint that in that this newfound independence may also open the way to a shift to more positive health-related behaviours among some students, and this would be worth further investigation.

Stress

Our results showed that women were more likely to experience frequent episodes of stress than men. Both men and women, however, experienced more stress in the UK. Stress is one of the most well-studied areas among Saudi Arabian international students, particularly acculturative stress (McDermott-Levy, 2011; Alhazmi & Nyland, 2012; Alyami, 2015; Lefdahl-Davis & Perrone-McGovern, 2015). Acculturative stress is defined as the psychological challenges of living in and adapting to a new culture, including homesickness, lack of support and adjusting to new cultural values (Yan & Cardinal, 2013). When the respondents in this study were asked about the causes of their stress, factors that could be classified as acculturative stress arose frequently.

The fact that significantly more women experienced regular stress than men, but that both genders had similar experiences of increased stress in the UK may suggest that while women's restricted and segregated lives in Saudi Arabia embeds a higher underlying level of stress in

women, both sexes find adjusting to life in the UK to be stressful. This is worth further study since previous studies have tended to argue that acculturative stress has a particularly profound impact on Middle Eastern women since the lifestyle changes are more significant for them than for men (Lefdahl-Davis & Perrone-McGovern, 2015).

The most significant cause of stress for the international students, however, was their academic studies. Academic study is a common cause of stress for undergraduates, both domestic and international (Burns, 1991; Robotham, 2008; Misra & Castillo, 2004). A second significant contributor to stress was general adult responsibilities, stating that they now had to organise, pay for and clean everything themselves. This is an issue that has been raised by other studies of Middle Eastern international students, where “going alone” is seen as a challenge (McDermott-Levy, 2011; Heyn, 2013; Alzayani, 2013).

This appears to be an issue that is common for Saudi international students at all levels, and two culturally-specific reasons are proposed here. Firstly, approximately 800,000 people are employed as domestic workers in Saudi Arabia, which is the largest employer of domestic workers in the Gulf (Schwenken & Heimeshoff, 2011; International Labour Organization, 2013). Cleaning and cooking are therefore potentially a new form of stress for students unaccustomed to these activities. Secondly, related to acculturative stress, is the stress of living alongside activities in the UK that are considered to be haram (forbidden) in Saudi Arabia, such as alcohol consumption or pork consumption. It is also possible that peer pressure, which is noted to have a particularly strong impact on alcohol consumption, may encourage respondents to engage in haram activities, causing guilt (McNeill et al., 2006). For ethical reasons, and to maximise responses to the survey, this was not an area that this study could explore. The difficulty of accessing and assessing information about such behaviours from Saudi respondents has likewise been noted in previous studies (Heyn, 2013; Alzayani, 2013).

Overall Health and Weight

The results of the final survey question were clear: 55% of respondents stated that their lifestyle in the UK was healthier than their lifestyle in Saudi Arabia. These respondents gave three main reasons for their perception that they lived a healthier life in the UK, of which the most common was living in a more health-promoting culture. This appears to relate to the idea that the UK has a social environment that encourages healthy eating, physical activity and a healthy lifestyle more consistently than that of Saudi Arabia, as outlined above (McNeill et al., 2006). The responses also appear to relate to the notion of being able to make positive use of newfound independence, as we discussed in respect to food and diet and physical activity.

This perception of an environment that is more supportive of good health-related behaviours seems to be borne out by the results in respect to bodyweight, with significantly more respondents reporting having lost weight than having gained it. The original survey did not directly ask respondents whether they perceived weight loss (or gain) as a positive change in their particular circumstances. Nonetheless, the fact that the majority of respondents attributed their weight loss to undertaking more physical exercise and eating more healthily is interesting since both are strongly linked to a reduced risk of non-communicable diseases including obesity, hypertension and diabetes (WHO, 2003; Warburton et al., 2006; National Health Service, 2017). The weight loss reported here, therefore, can be seen, broadly, as indicating positive changes, rather than as being the result of factors such as stress.

Limitations of the research

There are four main limitations to this study: firstly the scope and scale of the study meant that not all health behaviours could be explored and therefore areas such as halal food, alcohol consumption and drug usage have not been considered but could be in any future research. For

drugs and alcohol, this exclusion was, in part, also shaped by a combination of cultural sensitivities and ethical considerations from the University, around these subject areas. Similarly, there is a need for more extensive research into food and dietary changes among Saudi undergraduate students overseas that takes gender into account. Secondly, whilst the number of respondents (n=212) was not insignificant, it provided a relatively small sample, making it difficult to determine how far the sample is representative of all international Saudi students. Thirdly, a more robust method of determining that self-selecting respondents were indeed current undergraduate students may have been employed. Fourthly, student perceptions of the extent to which their behaviours are “healthy” may be inaccurate (Adams et al., 2005; Alzamil et al., 2019).

CONCLUSION

The results of this study have highlighted trends regarding the health-related decision-making and lifestyles of Saudi international undergraduates in the UK which differ from the findings in much of the literature. Previous studies have tended to explore either the experiences of postgraduate Saudis, or those of international students from a variety of backgrounds, finding that the impacts of studying in the West on health-related behaviours and decisions were overwhelmingly negative. Reduced physical activity and poorer diets have particularly been highlighted as negative changes to lifestyle as a result of studying in the West (Yoh et al., 2008; Alzayani, 2013; Cahill & Stavrianeas, 2013; Hall, 2013; Loomes & Croft, 2013; Alyami, 2015; O’Sullivan & Amirabdollahian, 2016). This study reveals a more ambiguous picture, however. Although it reveals evidence for a higher prevalence of some unhealthy lifestyles such as more stress and a tendency to smoke, the majority of the Saudi undergraduate students in the UK who took part stated that they perceived their lifestyles to have got healthier, particularly through increased physical activity and better dietary practices (although the quantitative data in respect to the latter is more mixed).

These unexpected results potentially open new vistas for research. This study offers a glimpse at a previously unstudied cohort of students in the UK, and demonstrates that their needs and experiences may be quite different from other groups of international students. It may be interesting to narrow the focus of this exploratory study to just one factor of a healthy lifestyle (e.g. exercise, or diet) and conduct a more detailed qualitative study in order to understand what Saudi undergraduate students in the UK perceive a “healthy diet” to be, for example, in order to establish the validity and reproducibility of the results of this study.

Since this study was based on such a small sample, just 212 of the 2835 Saudi undergraduate students in the UK at the time of the study (HESA, 2020), there are no tangible recommendations that can be made for public health practitioners on the basis of its results. The most significant recommendation that can be drawn is that public health practitioners and higher education professionals should not make the mistake of treating Saudi international undergraduates as a homogenous group or of making assumptions based on the previous research. It is clear from this study that Saudi undergraduates in the UK have specific cultural experiences regarding their lifestyles and health-related decisions during their studies, and thus the main outcome of this study is to have identified the need to research this group further in order to more fully understand their specific needs.

DISCLAIMER

The authors of this article are solely responsible for the content thereof. Data, ideas and opinions presented herein do not necessarily represent the corporate views of the Liverpool John Moores University or of the Saudi Arabian Oil Company.

REFERENCES

- Adams, S.A., Matthews, C. E., Ebbeling, C. B., Moore, C. G., Cunningham, J. E., Fulton, J. and Hebert, J. R. (2005). The Effect of Social Desirability and Social Approval on Self-Reports of Physical Activity. *National Center for Biotechnology Information*, **161**, 389–398.
- Al-Fouzan, S. A. (2012). Using car parking requirements to promote sustainable transport development in the Kingdom of Saudi Arabia. *Cities*, **29**, 155–212.
- Alhazmi, A. and Nyland, B. (2012). The Saudi Arabian international student experience: from a gender-segregated society to studying in a mixed-gender environment. *Compare: A Journal of Comparative and International Education*, **7925**, 1–20.
- Al-Hazzaa, H. M. (2004). The public health burden of physical inactivity in Saudi Arabia. *Journal of Family and Community Medicine*, **11**, 45–51.
- Al-Hazzaa, H. M. (2007). Rising trends in BMI of Saudi adolescents: Evidence from three national cross sectional studies. *Asia Pacific Journal of Clinical Nutrition*, **16**, 462–466.
- Al-Nakeeb, Y., Lyons, M., Collins, P., Al-Nuaim, A., Al-Hazzaa, H., Duncan, M. J. and Nevill, A. (2012). Obesity, physical activity and sedentary behavior amongst British and Saudi youth: A cross-cultural study. *International Journal of Environmental Research and Public Health*, **9**, 1490–1506.
- Al-Othaimeen, A. I., Al-Nozha, M. and Osman, A. K. (2007). Obesity: an emerging problem in Saudi Arabia. Analysis of data from the National Nutrition Survey. *Eastern Mediterranean Health Journal*, **13**, 441–448.
- Alyami, A. (2015). *Cross-Cultural Studies among Saudi Students in the United Kingdom*. PhD thesis. Brunel University, UK.

- Alzamil, H. A., Alhakhbany, M. A., Alfadda, N. A., Almusallam, S. M. and Al-Hazzaa, H. M. (2019) A Profile of Physical Activity, Sedentary Behaviors, Sleep, and Dietary Habits of Saudi College Female Students. *Journal of Family and Community Medicine*, **26**, 1–8.
- Alzayani, S. (2013). The Experience of Lifestyle Changes among Middle Eastern Graduate Students in the United States. *European Journal of Educational Sciences*, **1**, 190–204.
- Bahammam, A. (1995). Accommodating pedestrians in contemporary residential neighborhoods: Riyadh, Saudi Arabia. *Journal of King Saud University*, **7**, 3–30.
- Bergier, M. (2015). Physical activity of students from selected countries. Studies review. *Progress in Health Sciences*, **5**, 169–173.
- Bunker, J. (2001) *Medicine matters after all: measuring the benefits of medical care, a healthy lifestyle, and a just social environment*. Nuffield Trust Series no 15. London: The Stationery Office
- Burns, R. B. (1991). Study and Stress among First Year Overseas Students in an Australian University. *Higher Education Research and Development*, **10**, 61–77.
- Cahill, C.R. and Stavrianeas, S. (2013). Assessing Dietary Changes in International Students and the Barriers to Healthy Living Abroad: A Review. *Journal of Exercise Physiology Online*, **16**, 51–63.
- Cluskey, M. and Grobe, D. (2009). College Weight Gain and Behavior Transitions: Male and Female Differences. *Journal of the American Dietetic Association*, **109**, 325–329.
- Daniel, J. (2015). Sampling: The Foundation of Good Research. In Guest, G. and Namey, E. E. (eds) *Public Health Research Methods*. London: Sage, 511–552.
- Finlayson, G., Cecil, J., Higgs, S., Hill, A. and Hetherington, M. (2012). Susceptibility to weight gain. Eating behaviour traits and physical activity as predictors of weight gain

- during the first year of university. *Appetite*, **58**, 1091–1098.
- Glanz, K. (2017) Health Behavior and Risk Factors: In Quah, S. and Cockerham, W. (eds.) *The International Encyclopedia of Public Health*. Academic Press, Elsevier, 393–398.
- Goodman, R. and Tolley, R. (2003). The Decline of Everyday Walking in the UK: Explanations and Policy Implications. In Tolley, R. (ed) *Sustainable Transport: Planning for Walking and Cycling in Urban Environments*. Abingdon: Woodhead, 70–83.
- Hall, T. R. (2013). *Saudi Male Perceptions of Study in the United States: An Analysis of King Abdullah Scholarship Program Participants*, EdD thesis Western Kentucky University, US.
- HESA – Higher Educational Statistical Agency (2020) *Where do HE Students Come From?* Available at: <https://www.hesa.ac.uk/data-and-analysis/students/where-from>
- Heyn, M. E. (2013). *Experiences of Male Saudi Arabian International Students in the United States*, PhD thesis Western Michigan University, US.
- International Labour Organization (2013). *Domestic Workers Across the World: Global and regional statistics and the extent of legal protection*. International Labour Organization: Geneva.
- Kemp, S. (2020) *Digital 2019: Saudi Arabia* Available at: <https://datareportal.com/reports/digital-2019-saudi-arabia>
- Lefdahl-Davis, E. M. and Perrone-McGovern, K. M. (2015). The Cultural Adjustment of Saudi Women International Students: A Qualitative Examination. *Journal of Cross-Cultural Psychology*, **46**, 406–434.
- Lloyd-Richardson, E. E., Bailey, S., Fava, J. L., Wing, R. and The Tobacco Etiology Research Network (2009). A prospective study of weight gain during the college freshman and

- sophomore years. *Preventive Medicine*, **48**, 256–261.
- Loomes, S. and Croft, A. (2013). An investigation into the eating behaviour of international students studying at an Australian university: should we be concerned? *Journal of Higher Education Policy and Management*, **35**, 483–494.
- McCormack, G. R. and Shiell, A. (2011). In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. *International Journal of Behavioral Nutrition and Physical Activity*, **8**, 125.
- McDermott-Levy, R. (2011). Going alone: The lived experience of female Arab-Muslim nursing students living and studying in the United States. *Nursing Outlook*, **59**, 266–277.e2.
- McNeill, L. H., Kreuter, M. W. and Subramanian, S. V. (2006). Social Environment and Physical activity: A review of concepts and evidence. *Social Science and Medicine*, **63**, 1011–1022.
- Misra, R. and Castillo, L. G. (2004). Academic Stress Among College Students: Comparison of American and International Students. *International Journal of Stress Management*, **11**, 132–148.
- Moradi-Lakeh, M., El Bcheraoui, C., Tuffaha, M., Daoud, F., Al Saeedi, M., Basulaiman, M., Memish, M.A., AlMazroa, M.A., Al Rabeeah, A.A. and Mokdad, A.H. (2015). Tobacco consumption in the Kingdom of Saudi Arabia, 2013: findings from a national survey. *BMC Public Health*, **15**, 611.
- National Health Service (2017). *Benefits of exercise*. [online] Available at: <http://tinyurl.com/6aftr5vb> [Accessed January 22, 2015].
- O’Sullivan, N. and Amirabdollahian, F. (2016). *Loyal Tongue, Liberal Mind: International*

- Students' Experiences on Dietary Acculturation in England. *Journal of International Students*, **6**, 107–127.
- Office for National Statistics (2016). *Adult smoking habits in Great Britain: 2014*. [online] Available at: <http://tinyurl.com/jhznfnwr> [Accessed November 18, 2016].
- Peltzer, K., Pengpid, S., Samuels, T.A., Özcan, N. K., Mantilla, C., Rahamefy, O. H., Wong, M. L. and Gasparishvili, A. (2014). Prevalence of Overweight/Obesity and Its Associated Factors among University Students from 22 Countries. *International Journal of Environmental Research and Public Health*, **11**, 7425–7441.
- Robotham, D. (2008). Stress among higher education students: Towards a research agenda. *Higher Education*, **56**, 735–746.
- Ross, T. (2012). *A Survival Guide for Health Research Methods*. Maidenhead: Open University Press.
- Saelens, B. E. and Handy, S. L. (2008). Built Environment Correlates of Walking: A Review. *Medicine and Science in Sports and Exercise*, **7**, 566.
- Schwenken, H. and Heimeshoff, L. (2011). *Domestic workers count: global data on an often invisible sector*. Kassel University Press: Germany.
- Swann, C., Carmona, C., Ryan, R., Raynor, M., Barış, E., Dunsdon, S., Huntley, J. and Kelly, M. (2010) *Health systems and health-related behaviour change: a review of primary and secondary evidence*, National Institute for Clinical Evidence.
- Transportation Research Board. Institute Of Medicine Of The National Academies (2005). Does the Built Environment Influence Physical Activity: Examining the Evidence. *Committee on Physical Activity Health Transportation and Land Use*, **282**, 4818–4827. Available at: <http://www.trb.org/publications/sr/sr282.pdf> [Accessed November 28,

2016].

Warburton, D. E. R., Nicol, C. W. and Bredin, S. S. D. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, **174**, 801–9.

Washi, S. A. and Ageib, M. B. (2010). Poor diet quality and food habits are related to impaired nutritional status in 13- to 18-year-old adolescents in Jeddah. *Nutrition Research*, **30**, 527–534.

World Health Organization (2003) *Diet, Nutrition and the Prevention of Chronic Diseases*, WHO Technical Report Series 916, Geneva.

Yan, Z. and Cardinal, B. J. (2013). Increasing Asian international college students' physical activity behavior: A review of the youth physical activity promotion model. *The Health Educator*, **45**, 35–45.

Yoh, T., Yang, H. and Gordon, B. (2008). Status of participation in physical activity among international students attending colleges and universities in the United States. *College Student Journal*, **42**, 1110–1117.

Table 1: Summary of changes in health behaviours

Health behaviour	Changes in health behaviour since coming to UK		
	negative	stayed the same	positive
Smoking (n=40)	10.4% (n=22)	87.3% (n=185)	2.4% (n=5)
Physical activity (n=155)	20% (n=31)	13% (n=20)	67% (n=104)
Healthy eating (n=212)	40.1% (n=85)	14.6% (n=31)	45.3% (n=96)
Stress (n=212)	55.7% (n=118)	29.2% (n=62)	15.1% (n=32)
Weight (n=212)	22% (n=47)	32% (n=68)	46% (n=97)
Healthy lifestyle (n=212)	26.4% (n=56)	18.4% (n=39)	55.2% (n=117)

Table 2: Change in eating and cooking behaviours between Saudi Arabia (KSA) and the UK

Behaviour	At least five times a week		Less than five times a week		Chi Squared (McNemar Test)	P value
	KSA	UK	KSA	UK		
Consumption of fast food (n=163)	23.9% (n=39)	36.2% (n=59)	76.1% (n=124)	63.8% (n=104)	6.452	0.011*
Consumption of energy drinks (n=163)	6.7% (n=11)	8.6% (n=14)	93.3% (n=152)	91.4% (n=149)	0.667	0.414
Consumption of soft drinks (n=159)	25.2% (n=40)	18.9% (n=30)	74.8% (n=119)	81.1% (n=129)	2.632	0.105
Consumption of doughnuts and cakes (n=163)	8.0% (n=13)	10.4% (n=17)	92.0% (n=150)	89.6% (n=146)	1.143	0.285
Consumption of sweets and chocolate (n=165)	26.7% (n=44)	24.2% (n=40)	73.3% (n=121)	75.8% (n=125)	0.727	0.394
Consumption of fruit and vegetables (n=167)	46.7% (n=78)	41.9% (n=70)	53.3% (n=89)	58.1% (n=97)	1.391	0.238
Consumption of red meat, chicken and fish (n=165)	78.2% (n=129)	64.2% (n=106)	21.8% (n=36)	35.8% (n=59)	14.297	0.0002**
Consumption of rice (n=163)	62.6% (n=102)	18.4% (n=30)	37.4% (n=61)	81.6% (n=133)	49.846	<0.001**
Cooking in oil (n=159)	17.6% (n=28)	14.5% (n=23)	82.4% (n=131)	85.5% (n=136)	1.191	0.275
Steaming (n=163)	22.1% (n=36)	18.4% (n=30)	77.9% (n=127)	81.6% (n=133)	0.947	0.330
Grilling (n=163)	31.3% (n=51)	36.2% (n=59)	68.7% (n=112)	63.8% (n=104)	0.800	0.371
Conventional oven (n=163)	49.7% (n=81)	36.2% (n=59)	50.3% (n=82)	63.8% (n=104)	6.541	0.011*
Microwave (n=163)	14.1% (n=23)	24.5% (n=40)	85.9% (n=140)	75.5% (n=123)	5.898	0.015*