Chapter #4

THE LIFESTYLES AND HEALTH HABITS OF STUDENTS FROM A QUEBEC UNIVERSITY

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ABSTRACT
Despite the physical and psychological benefits associated with healthy lifestyle habits, approximately 50% of Canadians fail to adopt an active lifestyle and a healthy diet (Statistics Canada, 2014). University students are no exception to this tendency, even though the literature acknowledges the benefits of healthy lifestyles for academic success (La Cascia et al., 2019). In this context, the objectives of this study were to: 1) examine the lifestyles and health habits of a sample of Quebec university students and 2) explore this sample's needs with respect to strategies that can be used to promote healthy habits on campus. A cross-sectional design, a web-based survey (n = 1,980 students), and three focus groups (n = 22 students, ~7/group) were used to reach these objectives. The results showed that: 1) 55.2% of students were considered sedentary and 81.2% did not meet the Canadian recommendations regarding vegetable and fruit consumption and 2) lack of time and excessive workload were the main barriers to physical activity practice and maintaining a healthy diet. Future research should focus on maintaining a balance between offline (e.g., workshops) and online (e.g., computer tailoring) interventions to promote physical activity and healthy diet maintenance throughout the academic year.

Keywords: lifestyle habits, physical activity, food habits, health, students, university.

1. INTRODUCTION

The World Health Organization (WHO) has already described the situation of obesity and overweightness as an epidemic (2003). Although obesity is a multifactorial health problem, the literature firmly establishes that those most affected by this problem overeat and lead sedentary lifestyles (WHO, 2014). Despite the many physical and psychological health benefits associated with healthy lifestyle habits, approximately 50% of Canadians fail to adopt an active lifestyle and healthy eating habits (Statistics Canada, 2014). In addition, the transition to university is recognized as a risk period for young adults regarding body weight management, as demonstrated in the US (Levitsky, Halbmaier, & Mrdjenovic, 2004), Sweden (Schmidt, 2012), Cyprus (Hadjimbei, Botsaris, Gekas, & Panayiotou, 2016) or Canada (Pérusse-Lachance, Tremblay, & Drapeau, 2010; Walsh, Taylor, & Brennick, 2018). The contribution of lifestyle habits in the field of education sparks interest among researchers, both when it comes to young students (Florence,

Asbridge, & Veugelers, 2008; Singh, Uijtdewilligen, Twisk, Van Mechelen, & Chinapaw, 2012) and adult students (La Cascia et al., 2019). In higher education, the literature acknowledges the potential benefits of healthy lifestyles for academic success, including physical activity and healthy diet (Wald, Muenning, O'Connell, & Garber, 2014). Additionally, many experts believe that environments influence the increase in obesity more than biological factors, such as body composition (Byrne & Hills, 2013), some going so far as to describe environments that promote obesity as "obesogenic" environments (Swinburn, Egger, & Raza, 1999; Swinburn et al., 2011).

2. BACKGROUND

Recent years have witnessed a sharp rise in obesity, a trend so disturbing it was declared an epidemic (WHO, 2014). Obesity is associated with increased risk of chronical diseases like cardiovascular disease, type 2 diabetes, arthritis, and some types of cancers (Kopelman, 2000). Moreover, weight gain is common during young adulthood (Norman, Bild, Lewis, Liu, & West, 2003). In 2014, 39% of adults were overweight compared to 28.9% in 1980 (WHO, 2014). Among Canadian adults, rates of overweightness rose from 27.8% in 1985 to 33.6% in 2012, while obesity rates tripled in the same period, from 6.1% to 18.3% (Twells, Gregory, Reddigan, & Midodzi, 2014).

Statistics Canada (2014) showed that 50% of Canadians do not adhere to active lifestyles and healthy eating habits, although such lifestyles have been acknowledged for their important psychological and physical benefits (Craft & Perna, 2004; Haskell et al., 2007). Identifying the reasons for this lack of adherence to healthy lifestyles will provide a basis for developing strategies and interventions to eliminate obstacles and motivate the population to improve their lifestyles (Weinberg, 2018).

Therefore, evidence-based, multi-level public health interventions could improve obesity-related behaviors in adults (Compernolle et al., 2014). There is growing agreement among experts that the environment, rather than biology, is driving this epidemic (Booth, Pinkston, & Poston, 2005; Hill, Wyatt, Reed, & Peters, 2003; Swinburn et al., 2011). Biology clearly contributes to individual differences in weight and height, but the rapid weight gain that has occurred over the past three decades is a result of the changing environment (Hill et al., 2003). In this regard, since 1980, it has been reported that students tend to gain a significant amount of weight during the first year of university. In the US, this phenomenon has been called the "Freshman 15" in reference to the perception that students gain 15 pounds (6.8 kg) during the first year of university (Brown, 2008). However, studies have shown that this weight increase actually ranges from 0.7 kg to 3.1 kg (Crombie, Ilich, Dutton, Panton, & Abood, 2009). Nevertheless, in 2007, data from a national survey revealed that nearly 30% of US college students were overweight or obese (American College Health Assessment, 2006). The literature shows that among university students, weight gain is associated with poor eating habits, stress, and lower physical activity following the transition from a structured high school environment to university (Crombie et al., 2009; Gropper, Simmons, Connell, & Ulrich, 2012; Vadeboncoeur, Townsend, & Foster, 2015). Because students do experience important weight changes, universities need to focus on increasing health promotion to help students maintain and adopt healthy behaviors (Vadeboncoeur et al., 2015).

The situation found in Quebec is different from the one found in Canada and the rest of North America given that students from this specific Canadian province do not transfer directly from high school to university. In Quebec, high school students have to complete a two-year general program prior to being admitted to university. Also, in Quebec, for

cegeps' students, physical education courses are mandatory and have a strong emphasis on active living instruction from Kindergarten to pre-university college. The introduction of a one credit course on lifestyle for two-year community college students resulted in a non-significant 8% reduction in the prevalence of overweight and obesity (Lytle et al., 2017). Therefore, one could wonder what are the characteristics of Quebec's university students regarding their prior equivalent of nine credits of physical education and lifestyle courses during their two-year preparatory college instruction. Indeed, it may be hypothesized that these students may be less subject to a weight increase when starting university. To our knowledge, this has not been investigated yet.

In this context, it becomes highly relevant to examine whether the "Freshman 15" phenomenon is also of concern in Quebec university students. To explore this issue, it is essential to study the lifestyle habits of students (in particular physical activity and eating habits) responsible for this phenomenon as previously mentioned by Vadeboncoeur and colleagues (2015). The originality of the present study lies in its combination of using both a qualitative and quantitative phases, which are described below.

3. OBJECTIVES

A mixed-method study including two phases, quantitative and qualitative, was used to achieve the following objectives: 1) to examine the lifestyles and health habits of a sample of Quebec university students and 2) to explore this sample's needs and interests with respect to strategies that can be used to promote healthy habits on campus.

4. METHODS

4.1. Procedure, tools and participants

4.1.1. First objective

The quantitative phase used a cross-sectional, web-based survey, which participants completed during the fall semester of the academic year. More specifically, an e-mail including a hyperlink to an online questionnaire was sent to all university students (n = 15,000) at the beginning of October 2016, and a recall was also sent to all of the students at the end of October. The final sample was composed of 1,980 students: female (F) = 1,517 (76.6%), male (M) = 463 (23.4%); mean age = 25 years (*SD* = 7.3). Notably, the gender proportions represented those of the overall university student population. Data was analyzed using SPSS (version 24) and descriptive statistics (means, standard deviations, percentages, and frequencies). The web-based survey comprised six sections, but due to space limitations, only three sections will be presented in the present chapter: 1) sociodemographic information, 2) physical activity (PA) habits, and 3) eating habits. The official guidelines recommended by the Canadian Government were used. The 2011 Canadian Society for Exercise Physiology (CSEP) guidelines suggested 150 minutes of moderate to vigorous PA per week for adults in bouts of 10 minutes or more (2011); these guidelines were used for all questions that assessed self-reported PA. Also, the Canada's Food Guide was used as a standard of healthy eating for adults. This guide presented four food groups, each with a standard portion: vegetable and fruit (V&F), grain products, dairy and alternatives, and meat and alternatives (Health Canada, 2011). The standard portion was used as a benchmark for V&F intake when participants were asked to report their intake for each day. We chose V&F because they are the reference in healthy eating.

4.1.2. Second objective

Several participants who completed the web-based survey (October 2016) did not agree to participate in a subsequent qualitative phase. When the second phase started, during the winter semester 2018, many of them had already completed their studies or left university. With the collaboration of the university, we were able to contact 339 active students, and 22 agreed to take part in the focus groups schedule. The focus groups comprised 22 students distributed as well (F = 17; M = 5), including undergraduates (n = 5) and post-graduates (n = 17). These students were divided into three groups: Group 1 (n = 6; F = 5, M = 1), Group 2 (n = 8; F = 7, M = 1), and Group 3 (n = 8; F = 5, M = 3). Each focus group lasted approx. 90 minutes and was guided by ten key questions divided into four major themes/environments based on the *Conceptual Framework* (Quebec Ministry of Health and Social Services, 2012): 1) individual characteristics, 2) living environments, 3) systems, and 4) overall context. Although there are several frameworks relevant to our subject (e.g., Cohen, Scribner, & Farley, 2000), the *Conceptual Framework* proved to be the best guide for examining the interaction of healthy lifestyles with multiple environments in a Quebec-specific context. Boutin (2007) inspired the analysis strategy. Content was audio recorded, transcribed, and analyzed using *NVivo* 11 qualitative data analysis software (Poupart, 2011), which facilitated the delineation, coding, and grouping of units of meaning, the emergence of sub-categories, and an analysis of the similarities and differences in the comments of the various participants.

4.2. Ethical, considerations and limitations

The ethics board of the home university approved this study, and all participants signed an informed consent form. Although the aim of qualitative research does not pertain to results generalization, the surveyed sample (n = 22) was not representative of university students. The overrepresentation of graduate students (n = 17) can be explained by the fact that these students are more prone to engaging in research. The results obtained from the second phase must therefore be interpreted with caution.

5. MAIN RESULTS/DISCUSSION

5.1. First objective

With regard to the quantitative phase, results showed that many students were not meeting the CSEP recommendation of 150 minutes of moderate-to-vigorous PA per week (44.8%). The present sample was considered more sedentary (55.2%) than the Canadian Community, which found that 46.3% of young adults were considered sedentary (Statistics Canada, 2014). However, the present sample was considered less sedentary (55.2% vs. 66.1%) than the sample examined by Pérusse-Lachance and colleagues (2010) in a study that also described various health-related factors within a Canadian university community. In addition, 33.6% of students reported not using any active transportation. This finding could potentially highlight barriers to the built environments, such as limited travel distance made accessible by walking or biking. As previous studies have shown, there is an association between living in walkable neighborhoods and having a lower BMI in adults of all ages (Loo, Greiver, Aliarzadeh, & Lewis, 2017). It could be interesting to examine potential barriers to active transportation as well as the effects of those barriers on students' engagement in healthy habits. In addition, results revealed that 81.2% of students did not consume the daily recommended portions of V&F (i.e., seven for women and eight for men). The mean daily V&F intake of the students was 4.54 portions. Regarding eating

habits, the present results are in line with those that have been found in the preexisting literature (Peltzer, Pengpid, Yung, Aounallah-Skhiri, & Rehman, 2016). The present findings also showed that students had a tendency to skip breakfast and snack less. These findings seem to corroborate previous studies that showed that 30% of the adult population skips breakfast. Moreover, students generally had less desirable eating patterns than did employees, as was also found by Pérusse-Lachance et al. (2010). These results appear to support the "Freshman 15" phenomenon. Given that most students tend to gain 0.7-3.1 kg in the first year of university (Crombie et al., 2009), it would make sense to assume that their health behaviors are not as beneficial as those of staff members, especially since recent studies (e.g., Smith et al., 2017) found an association between healthy habits and weight gain among adults.

5.2. Second objective

With regard to the qualitative phase, findings, from the angle of obstacles, fell into four main categories based on the *Conceptual Framework* (Quebec Ministry of Health and Social Services, 2012). First, results concerning individual characteristics showed that most students were interested in practicing PA but lacked the time and motivation to do so, owing to their heavy workloads. The same holds true for healthy eating, as students reported that their workloads did not allow them to organize meals in advance. These findings are consistent with those of Daskapan, Tuzun, and Eker (2006). Second, in terms of living environments, students found that the overall cost of PA facilities was slightly higher on campus than it was off campus. Similarly, a research study conducted in a U.S. university found that participation in PA was in decline and identified the increasing costs of on-campus sport facilities as a barrier (Jones & Barrie, 2011). Furthermore, students described the quality of on-campus food as very poor, expensive, and generally unhealthy, especially when compared with food in the neighboring environment. Third, with regard to systems, students highlighted the importance of improving the structure of the built environments on campus to facilitate the adoption of active transportation in a university setting. Indeed, the lack of connectivity between off-campus cycling paths poses a risk because cyclists are forced to ride in the street; this concern was also raised by Hill et al. (2003). Fourth and finally, the findings suggested that students welcomed the idea of workshops on the subject of health promotion activities to increase their awareness and knowledge of healthy lifestyle habits. Besides offering suggestions for health promotion workshops, students also demonstrated an interest in the development of an application tailored to their needs regarding PA and nutrition. In line with this later issue, an innovative intervention based on the computer personalization technology «*Computer-tailoring*», could be developed. *Computer tailoring* is a form of tailored communications which involves a "combination of strategies and information intended to reach one specific person based on characteristics that are unique to that person, related to the outcome of interest, and derived from an individual assessment" (Kreuter & Skinner, 2000, p.1). In conclusion, they believed that the university should develop policies that support healthy choices through the availability of nutritious food and an affordable fitness center (e.g., LaCaille, Dauner, Krambeer, & Pedersen, 2011).

6. FUTURE RESEARCH DIRECTIONS

Further research should target specific health promotion interventions among university communities to prevent weight gain and promote healthy eating and active lifestyles. Student living environments should be considered and developed with the needs

of students in mind if students are to acquire or maintain healthy lifestyles (e.g., Gadais, Boulanger, Trudeau, & Rivard, 2018; Quebec Ministry of Health and Social Services, 2012). Notably, the surveyed students underscored the importance of establishing a balance between offline (e.g., workshops) and online (e.g., computer tailoring) interventions tailored to their needs in terms of PA and nutrition. Thus, workshops such as active group breaks or healthy recipe demonstrations should be offered regularly throughout the year to maintain student interest in PA and healthy food choices. Computer-tailored interventions could be based on computer personalization technology, which creates an online, individualized program according to the user's desired lifestyle (Boudreau, Moreau, & Côté, 2016). A combination of these interventions would certainly go far in helping students acquire and maintain healthy lifestyle habits. Future longitudinal research could measure the effects of such interventions on students' lifestyle habits, motivation, or academic success.

7. CONCLUSION

This study mainly demonstrated that the lifestyles and health-related habits of university students could be greatly improved, therefore supporting the need to develop and evaluate health promotion and obesity prevention interventions within university communities. These interventions should target both campus and city environments as well as the students themselves. Despite that in Quebec, university students were provided with K-12 (for kindergarten to 12th grade, K-12 is an American expression that indicates the number of years of publicly supported primary and secondary education) physical and health education, the same concerns as the ones found in the US seem present during the first year of university. This study has the potential to guide other Canadian universities in developing a program to promote overall health among students, thereby ensuring the permanence of healthy and active lifestyles for them in the years following their transitions to university. We believe that, when used as an educational strategy, our study could serve as a model for other post-secondary institutions (or even for other professional fields), insofar as it offers a better understanding of the mechanisms associated with the adoption a healthy lifestyle.

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Short biographical sketch: Paule Miquelon is a full professor at the Department of Psychology, University of Quebec at Trois-Rivieres. She completed a doctorate in social psychology at University of Quebec at Montreal and a post-doctorate fellowship in social/health psychology at McGill University. Her current research focuses on promoting motivational approaches to health behaviour change, especially physical activity behaviour, and improving personal well-being. She is an expert in Self-Determination Theory, one of the leading psychological theories on motivation. Over the past 10 years, she has received external funding for research projects investigating the relationship between motivation and physical activity practice among adults from the general population and adults with type 2 diabetes. Professor Miquelon is a regular researcher in the *Groupe Interdisciplinaire de Recherche Appliquée en Santé (GIRAS-UQTR)* at the University of Quebec at Trois-Rivieres and the *Réseau Intersectoriel de Recherche en Santé de l'Université du Québec (RISUQ).*

Full name: Émilie Lachance
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Short biographical sketch: Emilie Lachance completed a PhD degree in kinesiology at Laval University, Quebec, in 2012. Her research interests revolve around 2 axes, i.e., the impact of mental work on cardiovascular health and, the prevention of obesity and the promotion of a healthy and active lifestyle. She was a clinical professor in kinesiology at University of Quebec at Trois-Rivieres from 2011 to 2018, she he is now acting as a project management office coordinator at the Quebec Government.

Full name: Alexandre Busque
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Short biographical sketch: Alexandre Busque completed a B.Sc. in kinesiology and a master in physical activity at the University of Quebec at Trois-Rivieres. He is interested in obesity prevention strategies from the perspective of healthy lifestyles and environments. His research interests also include resistance training benefits in older adults. He is working as a consultant for business trying to develop or implement wellness programs or initiatives among their employees.

Full name: Sylvie Ngopya Djiki
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Short biographical sketch: Sylvie Ngopya Djiki, completed a B.Sc in Chemical, Molecular and Cell Biology at University of Cape Town in South Africa and a Medical Degree at University El Hadj Ibrahima Niasse in Sénégal, prior to engaging in a Masters in physical activity and more recently, a doctoral in biomedical sciences at University of Québec at Trois-Rivieres. Her studies looked at the influence of environments on the growing problem of obesity. Her research mainly focused on sensitizing stakeholders to ways of facilitating healthy environments, promoting an active lifestyle and healthy food choices.

Full name: Élisabeth Lavallée
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Short biographical sketch: Élisabeth Lavallée held a B.Sc. in kinesiology and a master's degree in physical activity sciences at the University of Quebec at Trois-Rivieres. She is currently a PhD student in biomedical sciences. She is interested in alternative educational approaches, nature deficit disorder, children's development and healthy lifestyle habits. Her research aims to deepen the knowledge associated with the outdoor education approaches in Quebec and their effects on children's development.

Full name: François Trudeau
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Short biographical sketch: Dr. François Trudeau, Ph.D., is professor and researcher in exercise physiology at the University of Quebec at Trois-Rivieres since 1992. He is interested in the role of the school in promoting physical activity among youth, including active transportation, physical education and sport. He also conducts research in rehabilitation through exercise in people with chronic diseases. He is a regular researcher in the *Groupe interdisciplinaire de recherche appliquée en santé (GIRAS-UQTR),* the *Réseau Intersectoriel de Recherche en Santé de l'Université du Québec (RISUQ)* and a Fellow of the *American College of Sports Medicine*.

Full name: François Boudreau
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Short biographical sketch: Prof. Boudreau is a full professor at University of Quebec at Trois-Rivieres in the department of nursing. One of the fields of research of Prof. Boudreau concerns the application of health behavior theories (HBTs) for improving the comprehension of the proximal cognitive determinants underlying the adoption of health-related behaviors. Also, over the last 10 years, he developed an expertise in interventions using the technology of computer-tailoring in the context of type 2 diabetes management, prevention of cardiovascular disease, and weight gain prevention. Finally, he is also a regular researcher in the *Groupe interdisciplinaire de recherche appliquée en santé (GIRAS-UQTR).*