College Students and Eating Habits: A Study Using An Ecological Model for Healthy Behavior

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1. Introduction

Overweightness and obesity rates have dramatically increased over the past few decades and they represent a health epidemic in the United States, as well as in many other areas of the world (Mancino et al., 2008). According to a scoping review of risk behavior interventions in young men, Ashton, Hutchesson, Rollo, Morgan & Collins (2017) identified obesity as a serious health risk with an incidence rate of obesity reaching 29% of the population aged 20–39 years old (Ogden et al, 2016). Substantial life-changing transitions happened when young adults finish high school to start college or a working life (Stok et al, 2018). According to the literature (Crombie et al., 2009), university is a critical period for young adults regarding food choices and their relationship with weight gain.

Recently, the so-called Ecological Model has been considered as an acceptable framework to link individual and social behaviors with environmental determinants, to reduce serious and prevalent health problems (Sallis et al, 2015).
The aim of this study is to explore the barriers and enablers of healthy eating behaviors among US college students, using focus groups that foster open discussion between a small number of participants. This study is the first stage of a larger research project called "CONSUMEHealth. Using consumer science to improve healthy eating habits", funded by the European Union's Horizon 2020 research and Innovation programme.

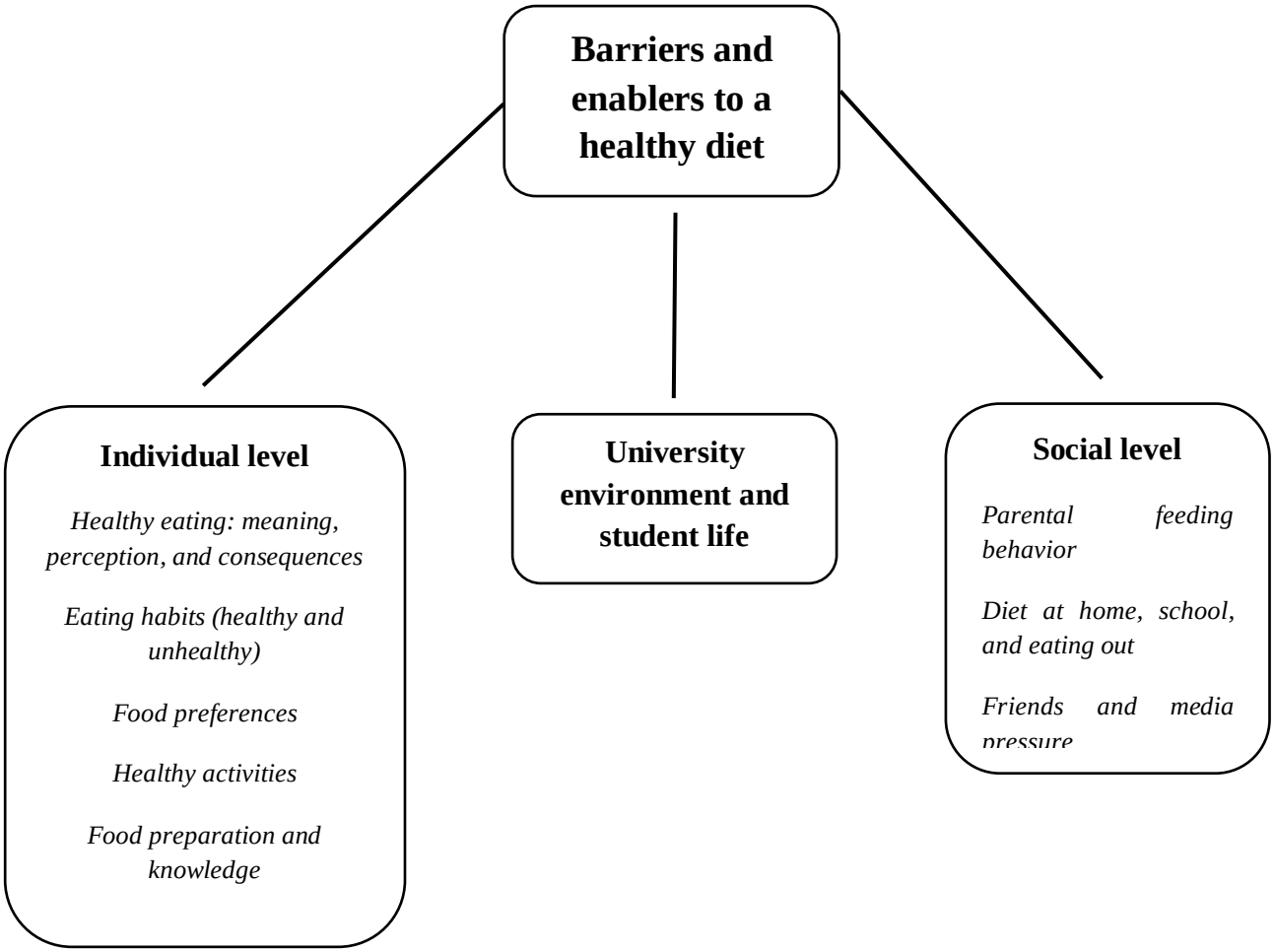
2. Materials and Methods

We selected focus group interviewing as a key methodology for the study. Eligible participants were college students aged 18 to 25 years, who were transitioning from adolescence to young adulthood, who lived in the USA. Following the literature, a semi-structured question guide was developed to identify the key questions for the research problem (eating habits, physical activity levels, and weight change). Projective techniques were used both at the beginning of the sessions for "ice-breaking", and later on, to understand better emotional connections and cognitions towards the topic of interest. Specifically, the photograph response test technique was used, which consists of showing a series of photographs that are related to the topic under investigation. The information resulting from focus groups is usually analyzed throughout a process of categorizing and coding the data in a systematic manner.
All quotes were encoded using the computer-assisted qualitative data analysis software Nvivo11 Plus Version 11 (QSR International Pty Ltd., Melbourne, Australia). This software helped the researchers at the stage of data analysis, marking, and coding the transcription, and helped them to identify the relations between categories (concepts, themes, and ideas) and individuals. An inductive thematic approach, which is useful for identifying core meanings that were relevant to the research objects, was used for data analysis, in which quotes were coded and categorized into themes and subthemes.

3. Results and Discussion

In our study, six focus group discussions were conducted until saturation of new information was reached. The final sample consisted of 35 students (23 females), with a mean age of 20.4 ± 1.5 years, and a mean BMI of 23.2 (SD ±4.52), which was calculated as weight (kg) divided by height squared (m^2). Most participants considered themselves to have a healthy weight status, and few of them indicated current or past eating disorders. Participants were also from a variety of study disciplines and different college years (from junior to senior). This variety in participant characteristics enormously contributed to gather more insights (e.g., diverse experiences and opinions) into the relationship between behaviors and healthy eating.
Using an adapted version of an Ecological Model used by Deliens et al., we developed a framework that included individual (intrapersonal), social (interpersonal), university environment (community settings), and students' life factors as influences affecting eating habits (Figure 1). This model integrated individual healthy and unhealthy eating patterns, in combination with the main barriers and enablers that are associated with health decisions during college life.

Figure 1. Factors influencing healthy eating behaviors of college students.



Many researchers (e.g. Ashton et al., 2017) identified a great number of factors that may contribute to the malnutrition epidemic, and related health problems (e.g., weight gain and other dietary disorders) in emerging adulthood: unhealthy eating habits increased when young adults leave their home circumstances, such as lower consumption of healthy options (i.e., fruit and vegetables), irregular meals (e.g., breakfast skipping), and increasing intakes of unhealthy snacks and other "junk food" (e.g., fried food). For college students, the transition phase from living at home to living alone/with roommates during the period of postsecondary education, is one of the most important life changes, and many food choices are deeply involved in this change. As indicated by other authors (LaCaille et al., 2011), the most common factors that are reported as barriers to a healthy diet are time constraints, the high price of food items, and their availability, followed by the lack of motivation in food preparation, which is strongly related to intention. Regarding the latter barrier intention is the main factor in predicting behaviour regarding the consumption of healthy foods, such as fruits and vegetables. Therefore, we believe that nutrition professionals within the university community should design programs and tools that can help students to be more motivated in choosing healthy food. During the focus groups, students realized the strong role of college facilities in influencing their eating habits. In fact, when students start college, they will face a new (food) environment (e.g., all-you-can-eat formula dining), which can have strong impact on their eating habits and intention to perform a healthy behavior. Interventions across campus dining facilities should decrease the potential barriers to healthy food, and increase self-efficacy and behavioral controls, to encourage students to embrace a better diet.

More population target studies focusing in the relationship between food and health is a topic of growing importance on the public agenda. Nevertheless, even with wide recognition that the food that we consume has a strong impact on our health, consumers' food preferences do not always lead to the best nutritional choices. A better understanding of the link between diet and health among college students is important for developing programs and behavioral change strategies to improve their lifestyle in general, and to reduce diet-related diseases in particular.
Table 1 summarizes the main barriers and enablers that are associated with health decisions during college life.

Table1. Summary of the main barriers and enablers to a healthy diet among college students (n =35).

BARRIERS	ENABLERS
Individual-level	**Individual-level**
Not exercising	Maintenance of healthy lifestyle
Not eating healthful food	Healthy eating habits
Time constraints	Food knowledge and education
Unhealthy snacking	Meal planning
Convenience food	Involvement in food preparation
Bad mood & stress	Physical activity
High prices	Being portion-aware
Junk food home availability	
Social-level	**Social-level**
Parental food behavior and influence	Friends pressure and influence
Friends pressure and influence	Parental food behavior and influence
Low food culture	
University Environment	**Environmental-level**
College's dining services	College's dining services
Availability of high-calorie food and fast food	

Source: own elaboration

4. Conclusion

This study highlights the importance of consulting college students when developing healthy eating interventions across the campus for dining services or programs. As suggested by Stok et al. (2019), researchers in the food and nutrition field should not only focus on individual-level factors, but they should also integrate socio-ecological aspects into the analysis. Dining halls and other University facilities should ensure the availability of healthy food choices, as well as promoting

physical activity practices regularly. They should also provide food education and food preparation classes, to make students more knowledgeable on how to cook and better plan meals.

Giving college students the necessary skills to be more aware of what a healthy diet style means would empower them to make better food choices throughout their life. As suggested by many authors, interventions should be specific for the targeted population (i.e., young adults) in order to help individuals to behave accordingly with their healthy intentions. For instance, social media facilitates the interaction between individuals and organizations (e.g., university administrators and food researchers), in order to provide tailor-made information. This aspect can be helpful in promoting healthy diets without creating eating disorders. In addition, price reductions for high-cost foods in campus facilities, such as dining halls and cafeterias, should also facilitate the purchase of more healthy options (e.g., fruits and vegetables). Environmental modifications can include changing and/or labeling healthy food options to make them more appealing, while creating a point of nutrition information where students can see healthy food options.

The aim of this study was to identify factors driving healthy lifestyle behaviors among US college students. Opinions and recommendations for effective and tailored-made intervention programs or environmental modifications that support healthy eating were presented, using an ecological framework that combined psychological, social, and environmental strategies.

Consumer behavior scientists typically do not contribute to the scientific debate about what is best to eat from a nutritional point of view or give recommendations about dietary components for the specific amounts and limits for food groups. In this study, we instead tried to understand the individual, social, and environmental factors that influenced students' healthy eating choices. Our results suggest that participants were influenced by individual, social, and university environmental factors.

The Ecological Model can help university communities to gain more insights into how and why students make certain food choices, and support them in staying healthy.

Colleges and dining halls on campuses should acknowledge their crucial role in guiding healthy eating behaviors, and be the first subjects to be interested in creating a healthy environment for the students. Unless they start understanding the reasons behind unhealthy eating behaviors of young adults, effective policies and managerial strategies to fight malnutrition (obesity, anorexia, micro-deficiency) cannot be developed.

The next step of this research will include the collection of a larger and more representative sample size, especially when taking into consideration the socio-cultural differences of college students between the US and other Western countries. Moreover, that the same negative trend of overweightness and unhealthy eating behavior among children, adolescents, and young adults is emerging in Europe, especially in Mediterranean countries.

List of Essential References

Ashton, L.M.; Hutchesson, M.J.; Rollo, M.E.; Morgan, P.J.; Collins, C.E. Motivators and Barriers to Engaging in Healthy Eating and Physical Activity: A Cross-Sectional Survey in Young Adult Men. Am. J. Men's Health 2017, 11, 330–343

Crombie, A.P.; Ilich, J.Z.; Dutton, G.R.; Panton, L.B.; Abood, D.A. The freshman weight gain phenomenon revisited. Nutr. Rev. 2009, 67, 83–94.

Deliens, T.; Clarys, P.; Bourdeaudhuij, I.; Deforche, B. Determinants of eating behaviour in university students: A qualitative study using focus group discussions. Br. Med. J. 2014, 14, 1–12.

LaCaille, L.J.; Nichols Dauner, K.N.; Krambeer, R.J.; Pedersen, J. Psychosocial and Environmental Determinants of Eating Behaviors, Physical Activity, and Weight Change Among College Students: A Qualitative Analysis. J. Am. Coll. Health 2011, 59, 531–538.

Mancino, L.; Kinsey, J. Dietary Knowledge Enough? Hunger, Stress, and Other Roadblocks to Healthy Eating 2008; USDA, Economic Research Service: Washington, DC, USA, 2008.

Ogden, C.L.; Carroll, M.; Kit, B.; Flegal, K. Prevalence of obesity among adults: United States, 2011–2012. NCHS Data Brief 2013, 131, 1–8.

Sallis, J.; Owen, N. Ecological models of health behavior. In Health Behaviour: Theory, Research and Practice, 5th ed.; Glanz, K., Rimer, B., Viswanath, K., Eds.; Jossey-Bass: San Francisco, CA, USA, 2015.

Stok, F.M.; Renner, B.; Clarys, P.; Deliens, T. Understanding Eating Behavior during the Transition from Adolescence to Young Adulthood: A Literature. Nutrients 2018, 10, 667.