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## Obesity Prevention Toolkit to Combat Weight Gain Related to Sedentary Behavior and Dietary Habits in College Students: An Evidence-Based Project

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Obesity Prevention Toolkit to Combat Weight Gain Related to Sedentary Behavior and Dietary Habits in College Students: An Evidence-Based Project

UNIVERSITY OF SAN DIEGO  
Hahn School of Nursing and Health Science  
Beyster Institute of Nursing

DOCTOR OF NURSING PRACTICE PORTFOLIO

by

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### Abstract

**Background:** Forty percent of the US population ages 20-39 are categorized as obese, their BMI is over 30, and 35% of college age students are obese or overweight. Issues related to obesity cost the US \$147 billion annually. Between 40%-50% of college students are reported to be inactive. Inactivity can lead to increased morbidity and mortality related to increased risks of cardiovascular disease, diabetes, hypertension, musculoskeletal issues, and depression. Providing dietary and physical activity education and access to nutritional information promotes behavior change in young adults.

**Aims of Service Change:** This evidence-based project proposal aims to provide a toolkit that can be utilized in higher education institutions with incoming students to increase self-efficacy related to positive dietary choices and increased physical activity amongst college age students. Ultimately, this has the potential to reduce the incidence of poor outcomes later in life.

**Details of Innovation:** This toolkit includes: dietary education using online resources, physical activity recommendations in accordance with the Centers for Disease Control and Prevention (CDC), and access to nutritional information digitally. This will be offered over a three-month period and results will be tracked throughout the term.

**Outcomes:** Implementation of an evidenced-based structured toolkit can provide benefits to higher education institutions by proactively addressing the ramifications of unhealthy lifestyles, weight gain and sedentary behavior which in turn has medical cost saving potential and increased retention rates.

Obesity Prevention Toolkit to Combat Weight Gain Related to Sedentary Behavior and Dietary Habits in College Students: An Evidence- Based Project

**Background and Significance of the Clinical Problem**

Obesity continues to be a leading precursor to preventable health related disease and conditions (Physical Activity Guidelines Advisory Committee, 2018). The Centers for Disease Control (CDC) reports that 40% of adults age 20-39 fall under the category of obese, having a body mass index (BMI) over 30 (Center for Disease Control and Prevention, 2020). Data also reveals that obesity prevalence is lower in individuals who have college degrees in comparison to their counterparts (Center for Disease Control and Prevention, 2020). Despite programs and resources, young adults, particularly those enrolled in higher education, continue to fall victim. A cross-sectional study of over 9,000 college students found that only 4.4% had correct knowledge of recommendations for physical activity (Abula et al., 2018). One part of the Healthy People 2020 initiative (now transitioned to Healthy People 2030) is the promotion of physical activity in youth and adults. Although there are known benefits to participating in regular physical activity, 80% of young adults are not meeting the recommendations by the Physical Activity Guidelines Committee (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2018). Further, 40%-50% of college students report to be inactive (Keating et al., 2005).

In conjunction with physical activity, dietary habits contribute to above average body weight. Healthy People 2030 also addresses concerns and provides recommendations regarding poor dietary choices leading to increased risk of obesity and chronic diseases (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2020).

College students in particular are at risk, there is a known association between academic performance, inadequate nutrition, and physical activity (Babaeer et al., 2021).

Evidence supports a new sense of autonomy and potential for greater stressors as college students transition during this pivotal time in their lives. Their habits around diet and exercise may change as they adjust from home to college life. These habits are ones that will persist to adulthood (Abraham et al., 2018). Equipping this population with the knowledge and support regarding physical activity and diet has proven beneficial in influencing positive life-long behaviors that ultimately decrease risk of preventable disease and obesity (Gow et al., 2010).

### **Summary of Evidence**

A literature review was conducted in efforts to gather evidence-based information regarding successful interventions and factors influencing sedentary behavior, dietary choices and physical activity amongst young adults in colleges and universities. Search engines included PubMed, Ovid, CINHAL, Cochrane, and government health informational databases. Key terms included: sedentary behavior, young adults, weight gain, freshman 15, web-based interventions, dietary health, college students, physical activity, exercise, nutrition labels, obesity, and behavior modification. Limitation criteria excluded articles that were not relevant to the targeted population or dating beyond ten years, although exceptions were made for seminal articles and key literature. Of the hundreds of results, twenty-five were critically appraised based on quality of evidence and relevancy.

The literature demonstrates that when obesity begins at an early age, the onset and subsequent ramifications associated with being overweight may commence earlier for the individual and have a negative impact on their lifespan (Brace et al., 2018). It is likely that obese children will remain obese well into adulthood and experience increased risks of developing non-

communicable diseases if interventions are not made (Bhadoria et al., 2015). This is the driving factor for early intervention.

Physical activity levels are known to decrease with age. This late adolescent-young adult period may be the last opportunity to intervene with cost-effective education regarding the detriments to health related to decreased activity (Huang et al., 2003). Accessible, readily available and supportive resources are shown to elicit the greatest behavior change in this population. Perception of overall wellness is a driving factor for change as well. Short-term solution focused interventions show benefit in overall wellness and perceived stress in college students (Beauchemin, 2018). Using social incentives and rewards is a motivating behavior change technique that is successful in college students. (Ashton et al., 2020).

Young adults in secondary education are at risk for adopting sedentary behavior due to their didactic demands (Carballo-Fazanes et al., 2020). Perceived stress is a major determinant of poor dietary habits and weight gain in college students (Choi, 2020). Sedentary behavior in this population is associated with poor educational outcomes (Babaeer et al., 2021). Increased physical activity is associated with greater cognitive function, decreased stress, and greater quality of sleep (Babaeer et al., 2021). Inadequate nutritional knowledge can lead to overweight and obesity. Incorporating education regarding reading nutritional labels was statistically significant in a cross-sectional study of 958 university students (Buyuktuncer et al., 2018). Dietary intake improved in terms of the quality and portion consumption and the authors suggest including it in nutrition programs (Buyuktuncer et al., 2018). A systematic review (Brace et al., 2018), demonstrated success in studies incorporating educational visuals near areas where food items are purchased on campus. In 11 out of 12 studies, changes in dietary habits were observed

when education was provided. The changes included consuming more fruits and dairy and less items with high fat content (Brace et al., 2018).

Lastly, increased sedentary behavior and decreased physical activity has been exponentially exacerbated by the COVID-19 pandemic in which with decreased physical activity and sedentary behavior increased with COVID-19 lockdown (Romero-Blanco et al., 2020). Findings in a study concluded physical activity improved mental health during COVID and demonstrated that positive mental health is a driving factor for academic success (Maher et al., 2021)

### **Purpose of Evidence - Based Project**

The purpose of this evidence-based project is to develop a set of recommendations, in the form of a tool kit, that can be used by higher education institutions to educate incoming students on healthy diet and physical activity recommendations. This is appropriate in the college age population as it is an opportunity when cost-effective educational interventions can improve health behaviors (Huang, et al., 2003). This age group is transitioning to autonomy and can develop positive, sustainable, and healthy adult behaviors (Cousineu et al., 2006).

### **Evidence- Based Practice Model**

The evidence-based model (EBP) used to drive this project is the John Hopkins Model. This EBP model was devised by staff and nurses at the John Hopkins Hospital and the Johns Hopkins University School of Nursing in 2002 in order to create a standard to problem solving a clinical matter using the latest and best scientific evidence (Dang & Dearholt, 2017). The model is a framework that guides clinicians to always strive to improve quality care. It stems from the concepts of using and integrating the most current and best evidence into clinical practice (Dang & Dearholt, 2017). A strength of the John Hopkins Model is that it follows a straightforward

linear progression for implementation. The model also works well within an educational system in which culture, accessibility, and resources can all be accounted for and tailored based on the setting of implementation.

### **Proposed Intervention Process**

Development of a toolkit of resources that can be used begins with dissemination of online educational materials to the incoming students at the beginning of the academic term. Students will receive education about daily physical activity and nutrition recommendations, and how to make individualized healthy dietary choices. The education phase will last approximately 3 months. Following the initial phase, Quick Response (QR) codes that include hyperlinks to campus health and wellness resources as well as nutritional education will be distributed and posted around campus in high traffic areas where food items are purchased such as food carts and dining halls. Activation and use of the QR codes provide the user with discounts around campus determined at the discretion of the institution.

Evaluation of the intervention at the end of the term will include analysis of food purchases at the designated establishments compared with the previous term to determine if there was an increase in healthy food items purchased. Use of campus sports or exercise facilities will be measured pre and post intervention. Academic retention and performance may be analyzed as well at the discretion of the institution.

### **Stakeholder Identification and Sustainability**

Future stakeholders for this evidence-based intervention project will be individuals involved in university and college wellness and health. These officials are invested in the prevention of health problems within their institutions. Their goal is to expand health and wellness knowledge to provide an enriching environment not only for the academic but also the



physical and mental wellbeing of students. These academic centers have direct access to research expertise with multidisciplinary health professionals (Plotnikoff et al., 2015). Personnel working with food service management will also be included as necessary for program planning and for obtaining pre and post data on purchase of healthy food items. For the greatest success, the principle investigator will meet with stakeholders initially to tailor the project to the institution needs and then periodically meet to discuss results, concerns and make changes as needed.

### **Project Timeline and Methods**

The proposed timeline for implementing this project is for one academic term. A 2018 randomized control trial regarding wellness in college students found that interventions that were short in duration and had focused outcomes were more successful than studies that took longer (Beauchemin, 2018). Institutional Review Board (IRB) approval to proceed with developing this toolkit was obtained on December 10, 2020 from the University of San Diego IRB.

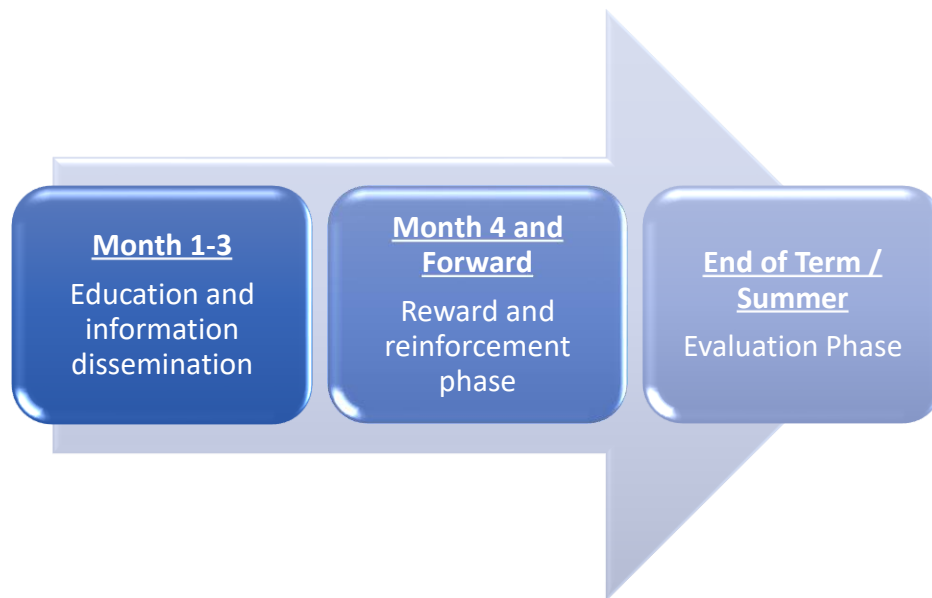
Prior to implementation in a specific institution, an educational stakeholder presentation must take place in order to review the purpose and importance of encouraging and supporting college age students to eat healthy and be more active. During this time the online education materials will be demonstrated and visual aids such as QR codes will be modeled.

Given evidence-based recommendations, the principle investigator created a short and succinct timeline allowing for engagement and sustainability. The introduction of the intervention will occur over a span of three months beginning at of the academic term or semester in which orientation occurs. During this stage the incoming students will participate in online education focused on dietary health recommendations supported by the CDC and the U.S Department of Agriculture. Education regarding physical activity as outlined by the Physical Activity and Guidelines Committee, which is supported by the Healthy 2030 initiative will be

provided as well as depicted in *Figure 1*. During stage two beginning at month four, nutritional labels by way of direct visuals and access via QR codes will be accessible to the students with monetary incentives such as discounts upon activation of the code. The last stage will span the duration of the academic term and will focus on evaluation of the interventions.

### Figure 1

*Timeline for Process Implementation*



### Outcome Indicators / Tracking

For this project, the target population is incoming students during orientation activities. This group will be easier to access than existing students. The process indicators for this EBP include implementation of online physical activity and dietary education and dispersal of nutritional information materials in areas of food consumption and purchase on campus. Tracking and evaluating success will come from review of food purchases as to determine dietary choices on campus as well as review of the usage of QR codes.

### **Project Impact and Cost – Benefit Analysis**

The benefits of this toolkit outweigh the cost and lifelong recompenses to the student body. There is a cost of around \$1400 more annually in healthcare costs per individual with obesity (Center for Disease Control and Prevention, 2020).

The expense to academic institutions will include the cost of advertising and distributing of materials, the time and personnel to provide education (this can be incorporated in the roles of the campus health professionals who are already invested in student body health), involvement of Information Technology (IT) departments to create QR codes that link back to university wellness resources, as well as increasing the availability of healthy food options. The benefits of all of these interventions are valuable not only the institutions but also society as a whole. There will be better academic performance from students, instilling healthy lifelong habits and a happier student population that aids in retention rates and timely graduation.

### **Potential Barriers and Limitations**

The potential barriers of implementing a toolkit aimed in decreasing sedentary behavior include voluntary participation from busy collegiate scholars, access to and number of dining and food purchasing establishments within the campus. The preceding factors can influence sample size and diversity of the target population. Location of the campus also poses a barrier in that nutritional concerns between areas may differ, for example large urban university campus versus rural settings or community colleges locations have differing nutritional concerns (Cousineau et al., 2006). During times of distance learning, such as with the COVID-19 pandemic, the number of individuals on campus with access to food purchasing venues is drastically reduced. This toolkit, in which results include analyzing food purchases and activation of QR codes around campus, requires the physical presence of students, distance learning would pose a great obstacle

for data collection. Alternative methods to use would be self-report of behavior change or completion of a survey. This intervention is not gender specific and research shows greater efficacy when the needs of men and women are independently accounted for (Cousineau et al., 2006). Culture and language should also be considered.

### **Implications for Practice**

Evidence demonstrates that educational institutions are in an advantageous position to influence dietary and physical activity behaviors in large numbers of young adults (Babaeer et al., 2021). A project of this magnitude has great potential to influence and promote positive lifelong behaviors at higher education institutions. This toolkit includes evidence-based interventions that can decrease incidence of obesity in young adulthood to prevent diseases and illnesses that are the result of weight burden such as diabetes, cardiovascular disease and orthopedic issues (World Health Organization, 2018). This toolkit can also be used to remediate the negative effects related to increase in distance learning and sedentary practices brought on by the COVID-19 pandemic (Romero-Blanco et al., 2020). Student success at academic centers is one of the monitored measures, however prioritizing and sustaining student physical and mental health proves to be just as important for school performance.

### **Conclusion**

There is strong evidence to support the need for structured dietary and physical activity education amongst young adults. Sedentary behaviors in the emerging adult population participating in higher education are multifactorial and can be compounded by extrinsic stressors. This age group is at particular risk for increased sedentary behavior resulting in decreased physical activity and unhealthy dietary choices that have the potential for lethality as they age if no intervention is initiated. Addressing obesity at higher education institutions has the

potential to reach and influence a large number of young adults who are at a transition point in their life. Higher education institutions are in an opportune position to change behaviors that can lead to negative health outcomes. Implementing physical activity and dietary education guidelines in conjunction with peer-to-peer motivational techniques has shown success in behavior change in college students and should be widely adapted in tertiary education settings.

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