PHYSICAL ACTIVITY IN COLLEGE STUDENTS

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INTRODUCTION

Physical activity is an important health behavior for people of all ages. According to the CDC, physical activity is one of the best behaviors people can do in order to improve their health. People who are active are more likely to live a long life free of chronic diseases. For those with chronic diseases, an active lifestyle can help manage some of the complications that accompany the disease. One in two adults in the United States lives with a chronic disease, and only about half of all adults get adequate physical activity to significantly reduce or prevent chronic diseases. In contrast, achieving the minimum guideline for physical activity has the potential to help prevent 1 in 10 premature deaths. More specifically, regular physical activity could prevent 1 in 8 cases of breast cancer, 1 in 8 cases of colorectal, 1 in 12 cases of diabetes, and 1 in 15 cases of heart disease (CDC).

Aerobic activity, often referred to as "cardio," is a form of physical activity that increases the heart rate. This can refer to a variety of different activities, such as dancing, walking, running, and even cleaning the house. The CDC creates guidelines on aerobic activity based on intensity or how hard your body works during physical activity. Aerobic activities can be categorized as moderate-intensity or vigorous-intensity. To measure the intensity of an activity, individuals can utilize the talk test. If they are able to talk but not sing, the activity would be considered moderate, and if they are unable to speak more than a few words, that would be considered vigorous activity. The CDC recommends 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or a mix of the two each week in order to obtain substantial health benefits (CDC).

Healthy People 2030 emphasizes the importance of physical activity in order to have a healthy population. Only one in four adults in the United States gets the recommended amount of physical activity for aerobic and muscle-strengthening activities. Since physical activity can have numerous benefits for the health of all people, there are Healthy People objectives related to physical activity that span several categories, such as arthritis, cancer, heart disease, stroke, overweight and obesity, and older populations, among others. A few objectives especially relevant to the college student population, in particular, include reducing the proportion of adults who get no physical activity during their free time (PA-01), increasing the proportion of adults

who do enough aerobic and muscle strengthening activity (PA-05), and increase the proportion of adults who walk or bike to get places (PA-10). Some of the Healthy People objectives may not seem relevant to college students at first glance, but maintaining good habits of physical activity in college and as a young adult can have a large impact on the health of individuals as they age. Creating a lifestyle full of physical activity can help improve cardiovascular health in adults (HDS-01), reduce proportion of adults with obesity (NWS-03), and reduce cholesterol in adults (HDS-06). Heart disease is the leading cause of death in the United States, with stroke not too far behind at the fifth leading cause. Therefore, it is important for college students to start good habits early so that they reduce risks for later illnesses (Healthy People).

THEORY

Health Belief Model

One study examined the weight management of first year college students in relation to physical activity and nutrition through the lens of the Health Belief Model (HBM). Studying college students in their first year is telling because of the lifestyle changes that often occur with the transition to college life. This study utilized nominal group technique (NGT) to specifically explore perceived susceptibility to not managing weight, perceived seriousness of not managing weight, perceived benefits and barriers to managing weight, self-efficacy in managing weight, and finally, cues to action. Participants were given a worksheet with six questions framed using the HBM to answer individually before discussing with the group. During group discussion, participants evaluated each idea and then voted on the rankings of priority in the ideas (Das & Evans, 2014).

When evaluating perceived susceptibility, a group of mixed-sex college students mentioned impacts on health, quality of life, and self-esteem. By remaining physically active, they feel better throughout the day and have more energy for classes as well as social activities. Other factors also included aesthetic beauty, such as the risk of gaining weight. For perceived seriousness, all participants reported that the consequences of not participating in physical activity behaviors were serious enough that the students would want to avoid them. Some factors of perceived seriousness included impaired quality of life, witnessing the struggles of family

members as a result of not making healthy choices and a negative impact on self-esteem and confidence. All students also agreed that there are benefits to being physically active, including being more physically attractive, having a better quality of life, and being more healthy physically and mentally. As far as perceived barriers, students identified lack of time, knowledge, and motivation as factors preventing them from being more physically active. Regarding self-efficacy, students were asked to rate their confidence in their ability to be physically active. On average, students rated their confidence in their abilities as moderately confident to very confident. Lastly, students were asked about cues to action for becoming more physically active that would help motivate them to change. Their responses included ideas such as increased social support, incentives, and including a course on weight management from the university (Das & Evans, 2014).

Overall, this study presents valuable insight into the factors that encourage and inhibit college students from being physically active. The majority of participants shared the beliefs that physical activity is beneficial, they are susceptible to serious consequences if they are not physically active, and they have the abilities needed to be physically active. Even with all of these factors directing students towards exercise, many college students still do not participate in adequate levels of physical activity.

Theory of Planned Behavior

One potential change as students move from high school to college is differences in the way they use their leisure time. Activities that may have been built into their schedule during high school may no longer exist or have the same structure in college, leaving students with much more leisure time and less guidance on how to use that time. In college, it is up to the student to make the choice of participating in physical activity in leisure time or not.

According to a study by Beville et. al, epidemiological evidence suggests that the amount of leisure time physical activity done by college students is not enough to improve health or fitness levels. This study aimed to examine college students' behavioral intent toward leisure time physical activity using the theory of planned behavior. The researchers provided a survey of undergraduate courses that were given anonymously and without added incentive. The survey

investigated students' attitudes, subjective norms, perceived behavioral control, intention, descriptive norm, self-efficacy, and finally, leisure time physical activity. For male students, the only correlation for leisure time physical activity found was intention, so the higher the intention score, the more likely they were to use leisure time to perform physical activity. Intention describes the amount of effort that individuals are willing to put in in order to perform a behavior that is under their control. For females, attitude, intention, self-efficacy, and sports participation were significantly correlated with leisure time physical activity, so the higher these scores, the greater participation in leisure time physical activity. Attitude describes how the individuals feel, whether it be favorable or unfavorable, regarding the behavior, and self-efficacy is an individual's confidence in their own ability to perform the behavior in a certain context (Beville et al, 2014).

The results of this study support the main framework of the theory of planned behavior in that intention is the greatest contributor to performing the behavior in question or engaging in physical activity during leisure time. When looking at the differences in leisure time physical activity between genders, males surpass females by far in the amount of physical activity they engage in.

Transtheoretical Model

The transtheoretical model utilizes stages of change to differentiate peoples' readiness to make a change in their life. This model can be applied to a variety of behaviors, including physical activity. The stages are laid out as precontemplation (not intending to perform the behavior or not considering the behavior), contemplation (intending to perform the behavior within the next 6 months), preparation (intending to perform the behavior within the next 30 days), action (currently performing the behavior for less than 6 months), and maintenance (performing the behavior for more than 6 months) (Sharifirad et al, 2011).

One study researched where college students fall on the stages of change criteria. They found 53.9% in the precontemplation stage, 4.8% in contemplation, 15.1% in preparation, 12.1% in action, and 14.1% in maintenance. They also found that the vast majority (73.8%) of the students involved in the study generally were inactive. This study suggests that in order to transition

sedentary students from inactive to active stages, there must be stress placed on the long-term benefits of physical activity and decreasing barriers to exercise on the personal level. This is especially important for students in the earlier stages of precontemplation and contemplation, which accounts for most of the students involved in the study (Sharifirad et al, 2011).

According to another study on stages of change for exercise in college students, students in higher stages of the transtheoretical model are more likely to self-determine regulation of exercise behaviors. This study examined the dispositional flow using flow theory along with stages of change. Flow theory asserts that the maintenance of behaviors is due to having clear goals, the ability to self-assess feedback on performance, and having a satisfactory skill level to perform the activity. Having a higher level of dispositional flow to exercise would likely also mean being in a higher stage of change. For this study, students completed a questionnaire that measured their level of behavioral regulations, dispositional flow, and stages of change in exercise. Students recruited for this study were required to be physically active, meaning they were in the preparation, action, or maintenance stages. Results of the study indicated that students in action or maintenance stages showed more self-determined motivation, meaning that they were more intrinsically motivated than those in the preparation stage. Students in the preparation stage also scored lower on dispositional flow areas such as having clear goals, concentrating on the task, and autotelic experience than those in higher stages (Ersöz & Eklund, 2017).

As found in the studies, college students require different approaches related to where they stand on the stages of change model. Whereas students in the higher stages of action and maintenance should focus on developing goals and improving the physical activity behaviors they already partake in, students in lower stages may need to focus more on eliminating the barriers that prevent them from performing the behavior.

INTRAPERSONAL FACTORS

Intrapersonal factors consider the impact of individual characteristics on behavior. These characteristics may include beliefs, attitudes, knowledge, demographics, or personality. Demographics, in particular, can include gender, race, and sexual orientation. One study looked

at these specific characteristics in relation to physical activity in college students (Wilson et al, 2019).

Gender differences in physical activity have been studied extensively, with men consistently showing higher PA levels. This is no different among college-age adults, with college women showing less participation in intramural sports, lower usage of campus recreation facilities, and less likelihood of lifting weights. Previous studies have also reported lower rates of physical activity among non-heterosexual individuals as well as among racial/ethnic minority students (Wilson et al, 2019).

This study surveyed students on both aerobic and muscle-strengthening exercises as well as demographics. No significant differences were found in moderate PA, vigorous PA, or muscle-strengthening exercise among those identifying as different sexualities or races, but men did report higher levels of vigorous PA and muscle-strengthening exercise than women (Wilson et al, 2019).

As far as physical activity recommendations, non-Hispanic white students were significantly more likely to meet aerobic PA and muscle-strengthening recommendations than students of other races. For differences in gender, there was no significant difference found in aerobic PA recommendations, but women were significantly less likely to meet the muscle-strengthening recommendations. No significant differences were found in either aerobic or muscle-strengthening recommendations among those of different sexual orientations (Wilson et al, 2019).

INTERPERSONAL FACTORS

Interpersonal factors examine the impact of connections with other people on behaviors such as physical activity. These interpersonal connections and interactions, such as those with friends and family, can have massive effects directly and indirectly on the behavior of individuals.

A study by Kim et al in 2015 investigated the effects of friend relationships on physical activity throughout the college years in students from both the United States and Korea. Physical activity

levels tend to decrease throughout the college years, causing college students to be at increased risk for negative health outcomes later in life. Establishing long-term healthy habits in college can be monumental for health going forward. Social support is considered a strong correlate for physical activity in and of itself, but it is also a factor in increasing self-efficacy in individuals. College students that exercise together with a friend report more motivation to be physically active and also end up exercising for a longer period of time than if they were alone (Kim et al, 2015).

This particular study examined the dyadic effects of friends on physical activity, or the influence of two-person relationships, using the Actor-Partner Interdependence Model (ACIM). The ACIM looks at actor effects, or an individual's current behavior based on their own correlates, and partner effects, or the extent to which a friend's correlates affect the behavior of the individual. Specifically, this study aimed to examine the actor and partner effects of self-efficacy and social support on physical activity in Korean college students. They found that individuals' PA is correlated significantly with how their friend scored for perceived friend support and that individuals' perceived relative health status is significantly correlated with the self-efficacy of their friend in exercise. There was no significant relationship between the PA of the individual and the PA of the friend (Kim et al, 2015).

Family is a main source of socialization as well as social support for many individuals. One study looked at the impact of family health values on physical activity in Muslim university students. In Qatar, family is a significant source of health information for children and adolescents and can influence attitudes, decision-making, and behaviors. High family support can encourage more physical activity, while the lack of support could be a barrier to physical activity. The study found that male students were much more likely to engage in regular physical activity than female students. When questioning students on their family health values, general trends included fathers being more active than mothers, or if a mother was physically active it was in different ways, such as housework or going on walks. With this example in place, more males grew up motivated to be physically active while females grew to be accustomed to a less active lifestyle. Some students also reported that as females, they were not allowed to participate

in the same activities as their brothers, which led them to be less physically active (Aljayyousi et al, 2019).

ORGANIZATIONAL, COMMUNITY, ENVIRONMENTAL, AND PUBLIC POLICY FACTORS

College students all share a common ground at the organizational level with the college or university they are enrolled in. Universities may provide a variety of resources to their students depending on their size, resources, and prestige, but these resources and opportunities can greatly influence the behaviors of their student body. Most universities offer their students a membership to an on-campus gym, fitness center, or campus recreation. The university might also offer intramural sports that students can participate in to have fun while getting exercise. No matter what specifics are provided at a certain university, college student's decision to engage in regular physical activity is undoubtedly influenced by the available resources. Although most students have facilities available to them to exercise in, many do not take advantage of the resource. One study looked at campus recreation attendance among first year college students through a randomized controlled study to investigate the impact of incentives. This study split students into three groups, a control group that received no incentive, a discontinued group that received incentives for the fall semester but not the spring, and a continued group that received incentives in both the fall and spring semesters. The study found that providing incentives did not negatively affect intrinsic motivation, so providing students with incentives to use the campus gym could be a valuable intervention for colleges to encourage a healthier and more active student body (Pope & Harvey, 2015).

One community factor that greatly influences college students is social media. People go to social media in order to connect with each other and build up their social circle or social support. The increasing importance of technology and social media has led to many college students utilizing fitness applications or wearable technology such as a smartwatch or fitness tracker. Social media also has the potential to reach a large audience of students to convey some idea, whether that be educational, marketing goods, or sharing the latest trends. Either way, fitness videos and resources are found all over social media. One social media trend focused on fitness is called "fitness inspiration" or "fitspo." These fitness-oriented posts designed to inspire others

can have benefits, but social media users also report harmful effects on body image and eating disorders. One study investigated these social media trends and how people viewed them. They found that the fitness content inspired many people to exercise and feel better, but that a lot of motivations included weight loss or aesthetic reasons, which could be harmful to those at risk of an eating disorder. Overall, they found mixed results between social media fitness influencers providing an inspirational, positive influence, or on the other hand, enhancing a negative self-image fueled by comparison and unhealthy behaviors. Nonetheless, the prevalence of fitness applications, advertisements, promotions, and more influences the type and frequency of exercise college students engage in (Raggatt et. al, 2018).

The environment surrounding a college campus largely impacts the physical activity of college students. Whether in the center of a large city or located in a small college town, the geography, and environment around students shape their activity and behaviors. One environmental factor is the ability to travel around campus by walking or biking. Attending college on a campus that is walkable or bikeable could lead to decreased BMI and increased physical activity in college students. 13 college institutions were analyzed and objectively rated on the walking/biking environment, as well as the BMI and physical activity of their students. Students were surveyed based on their attitudes towards physical activity, including the possible benefits of engaging in physical activity, goal-setting, and personal barriers such as a lack of time or finances. As a result, when a campus is more walkable, students have an overall lower BMI and hold a more positive attitude towards physical activity. Moreover, students who live off campus are less active than those who live on campus, most likely due to off-campus areas being less walkable than the campus (Horacek et al, 2016). Continuing to walk regularly will help college students maintain their weight and healthy lifestyle as they age, so it is important to emphasize the importance of walkability on college campuses, as well as in their surrounding areas.

Physical education policies are not as common or easy to implement for college students as for elementary, middle, and high school students, but about 40% of colleges and universities in the United States do require their students to undergo physical education classes in order to graduate. A study by Kim et al in 2019 examined the differences in how college students were motivated to exercise when they were required to take physical education classes compared to when they

could take elective classes. The study enlisted students from two different universities, one that required physical education courses and one that did not. Students completed a survey that measured their motivation, perceived competence, and physical activity level. They found that the students who were required to participate in physical education portrayed more amotivation, meaning that they were not motivated intrinsically or extrinsically. An implication of this is that the required classes managed to encourage students to exercise who otherwise would not. The elective classes, on the other hand, are more likely to reach students who are already motivated to exercise (Kim et al, 2019).

SUGGESTIONS FOR INTERVENTION

As various sources present, the majority of college students do not perform the recommended amount of physical activity that is necessary for significant health benefits. This is true for all adults as well, but college students share a particular set of circumstances that set them apart. In addition, the institutions of colleges and universities provide unique opportunities to intervene in the lives of students. These institutions are able to engage large numbers of students, especially students living away from home for the first time. They also are highly regarded for their practices which provide a good example for communities to follow. Lastly, they possess the resources to implement health-related initiatives and can even involve students seeking health-related careers to help administer interventions (Plotnikoff et al, 2015).

When examining the effectiveness of various interventions, one study found that interventions that last one semester or less generally result in better outcomes than longer-lasting interventions. Most interventions studied in college students are also mostly on females, with sometimes very different results among genders; therefore, it may be beneficial to tailor interventions differently to males and females. Effective interventions also included those that targeted self-efficacy and those that took place in a professional classroom setting (Plotnikoff et al, 2015).

Another study also investigated various physical activity interventions for college students. They divided the different interventions into four types: environmental, face-to-face, e-interventions, and combined. Out of these, face-to-face interventions were found to be the most effective for increasing physical activity in college students. E-interventions were effective in improving

physical activity cognitions but were otherwise ineffective. Environmental interventions were moderately effective in improving physical activity (Belogianni & Baldwin, 2019).

One intervention method took the educational materials used to teach college students the importance of physical activity and turned them into a game that students would be more encouraged to play. The students given the game were studied alongside a control group and showed significantly more improvement in cardiovascular improvement after finishing the program than the control group did with education only (Gonzalez et al, 2019). This study displays a valuable point that college students respond better to interventions that are fun or entertaining for them, not solely educational. It could also be impactful to make interventions competitive so that college students have the motive to take part.

Based on previous research, it seems that the best interventions are those that are presented in a face-to-face format and provide some sort of incentive or entertainment. In addition, it is ideal to have interventions that foster intrinsic motivation within students so that they are more likely to continue the behavior once the intervention is over. I believe improving physical activity in college students would fall under more changeable and more important on the decision matrix. As the literature has shown, college students understand the importance of physical activity, and they want to obtain the benefits of the behavior. In addition, it is imperative that students build those healthy habits sooner rather than later so that they may experience health benefits throughout their life as well as prevent negative health consequences. My suggestion for intervention would be to utilize a mobile app and social media to create an environment of friendly competition relating to physical activity on college campuses. Students would log in every time they go to the gym or exercise in other ways, and adhering to the recommendations allows them to be eligible for certain incentives such as gift cards or cash. While this intervention would initially be extrinsically motivated, it would hopefully get students exercising often enough that they feel the benefits and develop deeper intrinsic motivations.

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