PSYCHOLOGICAL FACTORS RELATED TO EXERCISE BEHAVIORS AMONG COLLEGE STUDENTS

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Abstract

With the prevalence of obesity steadily increasing throughout the United States, promotion of healthy behavior is as important as ever. Positive exercise and dietary habits promoted during the years an individual is in college can perpetuate a lifestyle change that ideally prolongs an entire lifespan. Researchers gathered data from 108 full time students, 18 years of age or older from the West Virginia University Student Recreation Center. Participants were recruited using convenient sampling and completed a 74-item questionnaire comprised of both qualitative and quantitative questions. The collected data, in collaboration with previous literature, has empowered the research team with suitable information to identify motives and barriers of exercise among the sample population. One significant finding suggests there is a moderate relationship between exerciser efficacy and how enjoyable exercise is perceived. These findings are in line with previous research, and propose that individuals will enjoy exercise more if they are more confident in their abilities to properly and effectively exercise.

Keywords: exercise, obesity, physical activity, college students

Introduction

Obesity has become a hot button topic within society, predominantly due to the consequences in which it is associated. There is an increasing
amount of evidence that suggests the problem is getting worse without any signs of stopping. One of the antecedents of obesity in adulthood is being overweight or obese as an adolescent. It is a worldwide epidemic that is not slowing down and is projected to continue growing. According to the World Health Organization approximately 1.5 billion adults over the age of 20 are overweight and of these, 500 million are considered obese, as of 2008 (World Health Organization, 2012). In the United States alone, approximately 1/3 are considered obese and more than 2/3 are either overweight or obese (LaCaille, Dauner, Krambeer & Pedersen, 2011). It is alarming that over two-thirds of adults in America are overweight or obese and this number will continue to rise as childhood obesity in America continues to be a growing problem. In order to prevent the rise in obesity as a society, we must change the way people think about dieting and exercise. The researchers of this study plan on studying the latter factor of obesity prevention, looking at the psychological factors that influence exercise.

With 1.5 billion adults worldwide being either overweight or obese (Rappange, Brouwer, Hoogenveen, & Baal, 2009), it comes at no surprise that much attention has been focused on the promotion of healthy behaviors. A poor diet, combined with a sedentary lifestyle, puts individuals at much greater risk for disease(s) connected to premature death. Explicitly lethal side-effects of poor eating habits combined with negligible regular physical activity, raises a major question: Why do about 43% of college undergraduate students report that they are neither moderately or vigorously physically active (Sailors, Jackson, McFarlin, Turpin, Ellis, Foreyt, Hoelscher, & Bray, 2010)? Exercise habits and nutritional patterns implemented during this time are powerful predictors of physical activity patterns later in life as adults. In fact, overweight or obese adolescents are 6.2 times more likely to evolve into overweight or obese adults (Topp, Edwards, Ridner, Jacks, Newton, Keiffner, Woodall, & Conte, 2011).

Addressing the population of sedentary college students is a crucial component in attempting to manage the prevalence of obesity in efforts to eventually lower the rates of overweight and obese individuals. Previous investigations have identified factors that would increase physical activity among moderately active college students if they had: more time where they do not have to make time commitments to either work or school so that they may do activities they choose, more motivation to get to the gym and exercise, and if they had sport to
train for (Ebben & Brudzynski, 2008). These factors among moderately active students are considered barriers among sedentary college students. A majority of these barriers are introduced to college students as freshman and continue to persist throughout the duration of their schooling. However, the noted barriers to physical activity among college students can be anticipated to continue outside of college. Traditionally, college students will graduate or drop out and begin a career in the workforce where “more time,” “fewer time commitments,” and “a sport to train for” will continue to subsist as barriers to physical activity. Despite researchers who claimed prior investigations illustrated improvements in psychological states following single bouts of exercise (Focht, Knapp, Gavin, Raedeke, & Hickner, 2007), many college students perceive barriers as being too much to overcome and hence continue a sedentary lifestyle.

The sedentary trends exhibited by college students will not change without a catalyst. There is an increase in behaviors that disregard the benefits of a healthy lifestyle and a decrease in engagement of physical activity among this population (Gomez-Lopez, Gallegos, & Extermiera, 2010). College students, predominantly freshman, are at a unique point in their lives making a transition from late adolescence to becoming adults capable of living on their own. During this psychological transition, many college students endure increased levels of stress and deal with frequent emotional turmoil (Lerner, Burns, & Roiste, 2011). These psychological predicaments may be perceived as barriers to physical activity, regardless of the positive affective states correlated with regular physical activity (Focht, et al., 2007). In some situations, the seemingly insurmountable stress and emotional confusion can perpetuate feelings of hopelessness and depression. Males and females who engaged in weekly regular physical activity demonstrated reduced feelings of hopelessness, depression, and were at a reduced risk of suicide (Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2008). Therefore, stress and conflicting emotions, which are perceived as barriers to exercise can in fact be treated by the body’s physiological responses to exercise.

A surplus of researchers have discussed in their literature, numerous barriers to exercise identified by a variety of individuals. Gomes-Lopez and colleagues (2010) determined that barriers to physical activity could be classified as internal or external. Prior investigations claimed that their participants mentioned internal
barriers as being “too tired (for physical activity),” “Don’t like physical activity,” and also “don’t see the use,” or “not capable” of being regularly active. Also identified was the idea that of external barriers relating to a general “lack of time.” External barriers are perceived by the individual and are influenced by the perception of internal barriers. Research has been done to determine the effectiveness of interventions on increasing physical activity; these interventions ask subjects to adhere to an exercise program (Murru & Ginis, 2010). One group of participants received no intervention and acted as a control, while the other two groups received an intervention which asked the participants to picture themselves in the future, either as a competent frequent exerciser or an overly obese, sedentary adult. The results of the survey showed that the two groups receiving either intervention reported longer durations of exercise when compared to the control group. The findings of Murru and Ginis (2010) support the concept that positive exercise behavior can be increased through a physical activity intervention while at the same time diminish the perception of internal barriers.

If levels of physical activity do not increase among the college population, the result will be young adults that finish college with negative exercise habits and barriers preventing them from obtaining regular exercise embedded deeply into their psychological core. The habits obtained and barriers established among sedentary students during late adolescence will place this particular population at six times greater risk (Topp, et al., 2011) to join the approximately 66% of overweight and obese adults in the United States (Ebben & Brudzynski, 2008). Rappange and colleagues (2009) report that obese individuals are at a greater risk of coronary heart disease, hypertension, Type 2 Diabetes as well as certain types of cancers. However, an ever increasing obesity rate not only affects those who are overweight or obese, but also healthy individuals from a financial point of view. The greatest difference between healthy and obese adults occurs in medication spending, where obese adults spend 25% more on medication than healthy adults do (Rappange, et al., 2009). This can be financially detrimental to healthy individuals who may be forced to pay greater insurance premiums or more in taxes. As part of the research conducted by Rappange and colleagues (2009), a statistical analysis measuring the costs associated with being obese was compared with the costs of being a “healthy adult.” The results of this hypothetical scenario conclusively determined that during the first 50 years, converting obese adults into
healthy adults would save costs in long-term care, hospital fees, primary care, and medication. Therefore, the consequences of obesity as a result of neglecting physical activity can be detrimental for the obese individual as well as other healthy adults in regards to a financial aspect.

It is conclusive that if nothing is done to promote physical activity among sedentary college students, they will most likely remain sedentary and potentially become obese adults. Previous literature has examined the affective responses to exercise, differences in motivation for different levels of activity among college students, and reasons why college students exercise. Previous research has found that the dominant reason for exercising is for enjoyment (Kilpatrick, Hebert, & Bartholomew, 2005). This study attempted to discover internal reasons and motives for college students to engage in exercise or remain sedentary. Psychological factors such as self-efficacy, motivation, social support, and perceived importance of exercise were identified through the mix-methods survey that participants filled out. It is the goal of the researchers to recognize common psychological trends among active college students. If successful, the noted psychological factors can be integrated into interventions attempting to promote physical activity. The researchers hypothesized that college students who are regularly active are also confident in their abilities to exercise properly (self-efficacy), value the importance of exercise in a healthy lifestyle, have a social support group (friends or family), and have a desire to exercise (motivation). Furthermore, the researchers predicted the motives for exercise that previous literature had identified would correlate with these psychological factors from the collected research. Therefore, the researchers predicted that individuals who have higher levels of self-efficacy, have a strong and supportive social group, possess more positive views of physical activity in regards to health and health behavior will exude the motivation necessary for positive exercise behavior and will also display more enjoyment for exercise, thusly increasing their adherence to a positive health and exercise regimen.

Methods

Participants

A cross-sectional and mixed-method design guided this investigation. Participants in this study were selected using convenience sampling at
the West Virginia University Student Recreation Center. In order to be included in this study, all participants were required to be 18 years of age or older and full time students at West Virginia University with free access to the Student Recreation Center. This type of sampling was advantageous because it enabled the researchers to gain access to a large number of participants who are likely regularly exercisers with ease and minimal financial obligation. The downfall of this type of sampling was the similarity of the participants among the population, which led to a slight bias in the results, as seen where 92.2% of the participants reported being regularly physically active based on the 2008 CDC guidelines, despite the national average of adults meeting these guidelines being 20% (CDC). The researchers gained a sample size of 120 participants; however 14 surveys were thrown out due to incomplete information, three were unreturned and one participant did not meet inclusion criteria. This left the researchers with 102 complete surveys for quantitative analysis; however, 108 were eligible for qualitative analysis. Of the 102 participants analyzed for the quantitative data, 52% of the participants were female, compared to 48% male, which made for a representative sample of the population of students at WVU. Ninety-six participants were Caucasian, three Black/African American, two Asian, and one Hispanic. Upon completion of the survey, participants were compensated for their time with free bottled water and small candies.

Measures

To obtain data, the researchers constructed a mixed-method survey to elicit responses about participants exercise behaviors (Appendix A). Ideas, concepts and questions were gathered from various validated surveys issued by agencies including the World Health Organization, the United States Center for Disease Control and the Karolinska Institutet in Sweden. Questions and ideas were combined into one self-constructed survey in order to address topics and questions directly to a college demographic compared to a general adult population in which these surveys addressed (Center for Disease Control [CDC], 2012; Karolinska Institutet, 2002; World Health Organization [WHO], 2006). Demographic questions were asked at the beginning of the survey to acquire information about the background of the participants.
Quantitative questions were asked next, using a five-point Likert-type scale asking participants to circle a selection that most closely resembled their feelings for each question. The questionnaire contains a not applicable option for each question to make choices exhaustive. A scale from 1 (not at all) to 5 (very much) was used for each question. The final four questions of the survey asked participants to write their responses for each, giving way to the qualitative data. The qualitative results supplemented the quantitative results to collaborate for a well-rounded perspective of the psychological factors influencing exercise behavior. The survey was completed by a majority of the participants in 15-20 minutes.

Procedures

After receiving approval from the West Virginia University Institutional Review Board, the researchers proceeded to the West Virginia University Student Recreation Center and asked participants to be involved in our study. A cover letter (Appendix B) was attached to ensure that the participants were at least 18 years of age or older, and to explain to participants that their results on the survey would remain anonymous. The researchers passed out the survey to various students keeping the survey process as random as possible. Participants completed a survey without adding any identifiable information to ensure confidentiality. Participants filled out the survey within the student recreation center in any area they felt private enough to do so. Completed surveys were placed in an unmarked, unidentifiable box with a slit for the surveys to keep the identity of the participants completely private. To ensure the protection of the data, it was kept with a researcher in a locked room to ensure security.

Results

Exercise Behavior Patterns

Demographic data of exercise behaviors revealed that most participants exercised at the West Virginia University Recreation Center three days per week (27.8%); additionally, 24.1% of participants reporting exercise at the recreation center five days per week, with slightly over
21% reporting using the facility four days per week. Among the same population, an overwhelming majority (38.9%) reported exercising outside of the West Virginia University Recreation Center zero days per week. While at the West Virginia University Recreation Center, 31.5% of participants reported the duration of their exercise to be between 45-59 minutes, compared to 21.1% of participants who claim to exercise for 60-74 minutes per visit. Among the participants, nearly all (99.1%) perceive physical activity to be beneficial to their overall health. Furthermore, 92.2% of participants identified themselves as being regularly physically active (meeting 2008 CDC requirements for regular physical activity, as elucidated in the survey) compared to 68.5% of the same participants claiming their immediately family members meet the same guidelines.

Descriptive data of exercise behaviors has discovered it is slightly more important to keep exercise an enjoyable as possible (\(M=4.41, SD=0.825\)) than it is to focus on the outcome of exercise relating to appearance (\(M=3.98, SD=1.08\)). Additionally, participants reported the quality of their workout at the West Virginia University Recreation Center (\(M=4.26, SD=0.717\)) to be greater than that of their perceived quality of exercise outside of the facility (\(M=3.47, SD=1.49\)). In a social context, participants are more likely to identify themselves as “exercisers” or being “fit” (\(M=4.02, SD=1.05\)), than they are to believe exercise takes time away from friends (\(M=1.86, SD=1.19\)) or miss social events because of exercise (\(M=1.98, SD=1.21\)). Finally, participants who were all full time students did not perceive exercise to negatively affect schoolwork (\(M=2.11, SD=1.25\)) or cause their GPA to suffer (\(M=1.57, SD=0.939\)). All of the preceding scores are noted below in Table 1.

**Statistics of Exercise Behavior**

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*Note.* The mean score noted is based on an anchor system of 1-5 where 1 represents “not at all” and 5 represents “very much.”

**Relationships Between Exercise Factors**

A Person-Product Moment correlation was conducted to examine any relationship between research variables. We compared responses to our created survey using SPSS data software to see if there was a relationship between efficacy (\(M=4.29, SD=0.88\)) and exercise enjoyment
as well as motivation during exercise (M=3.94, SD=0.88) and the perception of a crowd (M=10.02, SD=2.09, based on an analysis of three questions). The analysis provided a correlation explaining the extent to which two variables were related, if at all. The results of the Person-Product Moment correlation revealed a significant positive relationship between efficacy and exercise enjoyment: r(102)=0.469, p < .001; and a significant positive relationship between motivation during exercise and the perception of a crowd. These results indicated that higher levels of exercise efficacy correlated with higher levels of exercise enjoyment. Furthermore, the results also revealed that as perceptions of an observing crowd increase, so does motivation during exercise. However, the results cannot conclusively prove one factor caused another factor to increase/decrease.

In order to determine the difference between categorical variables, interdependent t-tests were conducted to examine how, if at all, responses to particular descriptive questions varied. A significant finding showed participants who believed exercise was beneficial to their overall health (M=4.29, SD=0.88) did so regardless of appearance as opposed to those who believed physical activity was only “a little bit” beneficial to their overall health (M=2.00, SD=0.0, t(100) = 2.603, p=0.011). Contrary to what the researchers hypothesized, there was no significant difference found for enjoyment in an exercise group run by an exercise instructor across gender (Males, M=2.67, SD=1.60, Female, M=3.40, SD=1.37), t(100) = -2.462, p=0.135. The final independent t-test showed no significant difference in an individual’s perception of exercise relating to personal goals between former high school athletes (M=4.34, SD=0.87) and former non-athletes (M=4.08, SD=1.44, t(99)= .928, p=0.110).

Qualitative Analysis

Qualitative questions were coded to determine factors influencing exercise behaviors, factors preventing positive exercise behaviors, and factors influencing efficacy. The top five reported factors influencing positive exercise behaviors were: health (66%), appearance (61%), weight management / loss (30%), muscle growth (26%), and stress relief (24%). The top five reported factors preventing positive exercise behaviors were: school work / class (71%), tired / lazy (50%), social
obligations (30%), lack of time in day (18.5%), and having a job (17%). Finally, the top three reported factors influencing exercise efficacy were experience (14%), mastery (12%), and current appearance (6.5%).

Discussion

The analyses revealed a relationship between efficacy as an exerciser and perceived enjoyment of exercise. The findings suggest an individual who enjoys exercise feels confident in their ability to exercise. Furthermore, the results also imply the more confident an individual is in their ability to exercise, the more they enjoy the activity of exercise. Previous findings have showed a relationship between efficacy during exercise and fatigue (Focht et al., 2007). Although the results illustrated a relationship between efficacy and enjoyment, based on the previous research, it can be implied that the less fatigue felt during exercise, the more exercise is perceived as enjoyable. Efficacy as an exerciser has a relationship with both fatigue and enjoyment. The more confident individuals are in their ability to perform and execute a task, the less fatigue they will identify as problematic, and the more enjoyable exercise will be perceived. It can be recommend that to increase enjoyment of exercise, which would ideally lead to more activity, the confidence people have in their ability to exercise should be increased. Based on the study by Focht and colleagues (2007), an increase in confidence to exercise correlated with less feelings of fatigue, which in addition to enjoyment, can also lead to more positive exercise behaviors.

In addition, the analyses found a significant positive correlation between perception of observers and motivation to exercise. It is extremely unlikely that the more motivated an individual is to exercise, the greater the perception of a crowd. With that said, if an exerciser becomes more motivated by noticeable actions such as yelling, screaming, and jumping, then that may cause the perception of a crowd to be greater, which could possibly explain these findings within the population studied. However, based on social psychology principles, it is most likely the crowd that influences the motivation of an exerciser. Other researchers have found differences in exercise preference across genders, which would support the findings in this study that suggest a relationship between a crowd and motivation. Females are more likely
to engage in exercise classes with other people run by an instructor, while males are more likely to engage in recreational sport participation (Kilpatrick, Hebert, & Bartholomew, 2005). In both circumstances, there is a crowd observing or evaluating one's activity, which based on the findings, would increase motivation.

From the findings, there are important discoveries that can be implemented during physical activity interventions in order to make them more successful. Firstly, based off the results attained within this sample population of exercisers, interventions should be in a group setting. This conclusion is based on the findings of this study where motivation tends to increase in the presence of a group. Group interventions will increase individual’s adherence to the group and motivate them during these interventions, considering their similarities to the population observed in this study. It is of note that these findings may not be applicable to those individuals with different demographics and backgrounds without further and more encompassing study including a larger demographic including non-regular exercisers and sedentary individuals in order to suggest possible interventions. This is to incorporate those individuals that were not included in this study such as non-regular exercisers, sedentary individuals or those with low self-efficacy as well as others, of which prescribed interventions may be different than suggested ones in this study.

Furthermore, interventions should focus on increasing the confidence of sedentary individuals who may be obese, in order to make them feel confident in their ability to exercise properly. The results can be weight loss and a healthier lifestyle, while bringing up past experiences of positive exercise behaviors and successes can increase efficacy. Perhaps individuals in specific group interventions were once high school athletes and were regularly active as an athlete; however, after entering college where they are no longer an athlete experienced a drop off in exercise behavior. During these group interventions, individuals can be asked to relive those moments when exercise played a positive role and was effective in their life. Having personal trainers that can work with sedentary non-exercisers can increase efficacy because they will feel confident in their ability to exercise, since an exercise professional showed them proper technique as well as individualized exercises to perform. Although the results do not say anything about efficacy and time and of exercise, the researchers hypothesized the more efficacious a person is in their ability to exercise,
the less time they will spend not exercising at the gym. A more confident exerciser will not waste as much time being indecisive on what to do for their next exercise as much as a less confident exerciser. Based on the analysis of the participants who are already active, results show a relationship between efficacy and exercise, and as a result, in order to increase how enjoyable exercise is perceived, it would be advantageous to make those exercising more confident in their ability to do such.

By examining the results of the additional independent t-tests, there proved to be no significant difference in exercising in a group run by an instructor across gender. Males and females both feel relatively similar in their opinions to exercise in a group. The researchers had anticipated females to predominantly favor exercising in a group based on what research had previously concluded (Kilpatrick, Hebert, & Bartholomew, 2005). However, the results of the independent t-test claim there was no significant difference. Instead, the results of the Pearson-Product Moment correlation suggested both males and females enjoy working out in groups as it increases motivation.

It was also in the interest of the research team to determine if playing a high school sport influenced people to set goals related to their exercise. The researchers had considered the notion that athletes were more goal oriented, based on personal experience, and their exercise behaviors would prove those factors compared to exercisers who were non athletes. However, analysis of the results explained there to be no significant difference in personal goals relating to exercise between former high school athletes and non-athletes, perhaps because the participants of this study are already an active population. With that said, it is not to discredit the effectiveness of goal setting. Mental physical activity interventions have shown the effectiveness of imagining one’s self in the future as either regularly active or unhealthy and sedentary (Murru & Martin Ginis, 2010). The results of this previous study suggest that setting goals, and imagining accomplishing those goals in the future can improve the frequency of physical activity among individuals, regardless of their participation in high school athletics or not.
Limitations

In this study, there were many limitations that will be elucidated below; however, despite the limitations, the results of the study did attain similar results as those of various peer reviewed articles. The results of the qualitative portion of the mix-methods survey coincide with previous literature to an extent. However, one of the limitations of the study may have altered the qualitative results. The survey used in this research was created by the research team, and was not piloted or tested by any professionals. In retrospect, the survey was too lengthy, and questions seemed systematic. The results of the qualitative questions at the conclusion of the survey may have been predisposed by the quantitative questions in the beginning of the survey. Perhaps the results would have been different if the qualitative questions were placed at the start of the survey, or if the 75 item questionnaire had been shortened. Another limitation is the reliability of the sample population to be a microcosm of a broader general population. The participants in our study reported being regularly physical active at a much greater rate than that of college aged individuals throughout the country. More than 90 percent of the participants claimed to meet the 2008 CDC guidelines for regular physical activity, much more than what would be found among other populations. A reason for this could be the type of sample used, and the location at which data was collected. The research team used convenience sampling and asked willing volunteers to complete the survey. The researchers gathered data at the West Virginia University Student Recreation Center, which is the reason why it is believed that the population exhibited such high levels of activity. The type of sampling used led to a homogeneous population, which negatively affected the external validity of the population.

Practical Application

It is the aim and hope that the results of this study upon physically active individuals would be applied to a sedentary population in hopes of introducing characteristics of active individuals to sedentary individuals to increase weekly physical activity. It can be beneficial for exercise psychology consultants or physical education teachers to educate their subordinates on the negative side effects of obesity.
Furthermore, it is useful to explain how obesity is a combination of the calories consumed daily through food and drink, and the calories expended via physical activity. It is important that individuals view obesity as a result of negative personal choices to eat unhealthily and remain sedentary. It is equally important that individuals realize they can gradually develop positive eating and exercise behavior the same way they developed negative lifestyle habits. Illustrating the consequences of life-long obesity and internalizing the responsibility of one’s own health can augment the value of good health among a sedentary population.

Ideally, a sedentary population will become aware of their negative lifestyle behavior, and decide to implement a long-term physical activity program to become healthier. Emphasizing appearance among a sedentary, obese population may be counter-productive, despite appearance being the second most popular reason for positive exercise behaviors noted by participants in this study. If visual changes do not occur expediently, it may lead to large rates of dropout due to health benefits being overshadowed by appearance. Based on the findings in the research, health is a predominant factor influencing individuals to be active. Stressing the importance of health in completing daily activities and life longevity can induce greater amounts of weekly physical activity among an inactive population.

Having previously non-active individuals engage in weekly physical activity is an important first step that exercise psychology consultants can help perpetuate. Emphasizing the importance of physical activity on overall health is an effective way to encourage sedentary individuals to begin an exercise regimen. However, if exercise is not perceived as somewhat enjoyable it will undermine the importance of physical activity on overall health. Based on the analysis of data, one way to increase enjoyment of exercise is to make individuals more confident in their ability to exercise. Exercise psychologists along with personal trainers can collaborate to ensure new exercisers feel confident in their abilities to exercise both physiologically and psychologically. Mental training skills such as imagery, and positive self-talk can relieve the amount of anxiety that a new exerciser may experience, while at the same time increasing efficacy. Having individuals visualize themselves doing an exercise perfectly, can lead to an increase in confidence when the time comes to physically perform that particular exercise. Positive self-talk can
increase confidence by having key words that block thoughts of doubt. By means of implementing a few simple mental techniques, exercise psychology consultants can increase how confident new exercisers are in properly developing and executing a workout, which based on findings of the researchers, can inevitably increase the enjoyment of physical activity.

Finally, conducting exercise-interventions in a group setting may increase motivation to exercise based on the correlation between motivation and a crowd, proved significant by the data analysis. As the perception of a crowd observing begins to increases, motivation to exercise increases as well, in regards to this more active population of participants. This finding can be applied to interventions, in hopes that motivation to begin to exercise among a sedentary group of people increases if there are others experiencing the same intervention in a group, as opposed to individual interventions. Moreover, the same group receiving the physical activity intervention can exercise together. Since the same group is motivated to exercise while in the intervention together, it is believed that motivation will remain present during the actual exercise.

**Conclusion**

Based on the findings of this study with a highly active population, a group atmosphere will increase motivation during exercise, and the presence of an exercise professional will increase confidence of individuals within a group of a similar demographic. A newfound confidence to exercise correctly can result from the supervision of an exercise professional, and will lead to exercise being more enjoyable. With enjoyable bouts of exercise helping individuals obtain their long-term goal of getting healthy in order to reduce the consequences of being obese, greater amounts of individuals will become regularly active. The more people engaging in regular physical activity who also encompass the knowledge necessary to make healthy eating choices will result in a lowering of the prevalence of obesity overtime.
References


Appendix A

Mix-Methods Survey

Please complete the survey to the best of your knowledge. All questions are optional and any question may be skipped. You have the right to stop taking the survey at any point. Your responses will remain confidential. Your answers on the survey will be used for research purposes only and will not affect your standing as a student and/or access to the recreation center.

We thank you for your participation.

Directions: Please circle one letter for each of the following questions.

1) Are you a full-time or part-time West Virginia University Student with full access to the student recreation center?
   a.i.1.a. Yes
   a.i.1.b. No

2) Are you regularly physically active based on the 2008 guidelines, which state that regular physical activity is at least 150 minutes (2 hours and 30 minutes) per week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous intensity aerobic activity?
   a.i.1.a. Yes
   a.i.1.b. No

3) What is your race?
   a. Caucasian
   b. Black/ African American
   c. Hispanic
   d. Other Please Specify
      _______________________

4) What is your gender?
   a.i.1.a. Male
   a.i.1.b. Female
5) What is your major ________________________________

6) Do you live in campus housing or off campus housing
   a. In campus housing
   b. Off campus housing

7) Approximately how long does it take you to get to the West Virginia University Recreation Center (on average)
   a. Less than 5 minutes
   b. 5-10 minutes
   c. 10-15 minutes
   d. 15-20 minutes
   e. 20-35 minutes
   f. 25-30 minutes
   g. Greater than 30 minutes

8) What is your age, in years?
   a.i.1.a. Younger than 18
   a.i.1.b. 18
   a.i.1.c. 19
   a.i.1.d. 20
   a.i.1.e. 21
   a.i.1.f. 22
   a.i.1.g. Older than 22

9) What is your class rank?
   a.i.1.a. Freshman
   a.i.1.b. Sophomore
   a.i.1.c. Junior
   a.i.1.d. Senior
   a.i.1.e. 5th year Senior
   a.i.1.f. Not a student
   a.i.1.g. Graduate Student

10) How many full years have you attended WVU?
    a. Less than 1
    b. 1
    c. 2
    d. 3
    e. 4
f. 5+

11) Were you involved in high school athletics?
   a. Yes
   b. No

12) Are you a part of a West Virginia University Varsity or Club sport?
   a.i.1.a. Yes
   a.i.1.b. No

13) Is/was anybody in your immediate family (siblings/parents) part of varsity sport at the collegiate or professional level?
   a.i.1.a. Yes
   a.i.1.b. No

14) Does anybody in your immediate family (siblings/parents) meet the 2008 guidelines for regular physical activity listed in question two?
   a.i.1.a. Yes
   a.i.1.b. No

15) Do you perceive regular physical activity to be beneficial to your overall health?
   a.i.1.a. Yes
   a.i.1.b. No
   a.i.1.c. A little bit
   a.i.1.d. Not sure

16) How many credit hours are you currently taking?
   a.i.1.a. Less than 12
   a.i.1.b. 13
   a.i.1.c. 14
   a.i.1.d. 15
   a.i.1.e. 16
   a.i.1.f. 17
   a.i.1.g. 18 or more
   a.i.1.h. Not a student
17) On average, how many days a week do you go to the West Virginia University recreation center?
   a.i.1.a. None
   a.i.1.b. 1
   a.i.1.c. 2
   a.i.1.d. 3
   a.i.1.e. 4
   a.i.1.f. 5
   a.i.1.g. 6
   a.i.1.h. 7

18) On average, how many days a week do you exercise outside of the West Virginia University recreation center?
   a.i.1.a. None
   a.i.1.b. 1
   a.i.1.c. 2
   a.i.1.d. 3
   a.i.1.e. 4
   a.i.1.f. 5
   a.i.1.g. 6
   a.i.1.h. 7

19) On average, approximately what is the duration of your visit to the West Virginia University Recreation center?
   a.i.1.a. Zero minutes
   a.i.1.b. Less than 30 minutes
   a.i.1.c. 30 – 44 minutes
   a.i.1.d. 45 – 59 minutes
   a.i.1.e. 60 – 74 minutes
   a.i.1.f. 75 – 89 minutes
   a.i.1.g. 90 minutes or more

20) On average, approximately what is the duration of your exercise when you are not in the West Virginia University recreation center?
   a.i.1.a. Zero minutes
   a.i.1.b. Less than 30 minutes
   a.i.1.c. 30 – 44 minutes
   a.i.1.d. 45 – 59 minutes
Directions: Please circle which number represents your feeling(s) towards each statement most accurately on a scale from N/A being not applicable, 1 being not at all, and 5 being very much. Use this scale for questions 21-73.

**Not at all**  
21) I am usually satisfied with the quality of my workouts at the West Virginia University recreation center.  
N/A 1 2 3 4 5

22) I am usually satisfied with the quality of my workouts outside of the West Virginia University recreation center.  
N/A 1 2 3 4 5

23) I am confident in my ability to do exercises correctly while at the West Virginia University recreation center.  
N/A 1 2 3 4 5

24) I am confident in my ability to do exercises correctly while not at the West Virginia University recreation center.  
N/A 1 2 3 4 5

25) I enjoy working out in an exercise class ran by an exercise instructor.  
N/A 1 2 3 4 5

26) Working out in exercise classes increases the intensity of my workouts.  
N/A 1 2 3 4 5

27) I feel comfortable working out in exercise classes.  
N/A 1 2 3 4 5

28) I would be willing to exercise in a class if it was a type of exercised that I would enjoy.
<table>
<thead>
<tr>
<th>N/A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>29)</td>
<td>Large crowds at the West Virginia University recreation center make me second guess if I am doing my exercises correctly.</td>
<td></td>
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<tr>
<td>N/A</td>
<td>1</td>
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<td>30)</td>
<td>I tend to feel that I have a higher quality workout when more people are at the West Virginia University recreation center.</td>
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<tr>
<td>N/A</td>
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<tr>
<td>31)</td>
<td>Once I get tired, I become less confident that the exercises I am doing are correct.</td>
<td></td>
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<tr>
<td>N/A</td>
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<tr>
<td>32)</td>
<td>I tend not to use or ask to use workout equipment if others are already using it.</td>
<td></td>
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<tr>
<td>N/A</td>
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<td>3</td>
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<tr>
<td>33)</td>
<td>The quality of my workouts increases when there are less people at the West Virginia University recreation center.</td>
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<tr>
<td>N/A</td>
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<td>3</td>
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<tr>
<td>34)</td>
<td>I would rather exercise on my own at a neutral location than use the West Virginia University recreation center.</td>
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<tr>
<td>N/A</td>
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<tr>
<td>35)</td>
<td>I feel highly motivated before the majority of my workouts.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N/A</td>
<td>1</td>
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<td>3</td>
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<td>5</td>
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<tr>
<td>36)</td>
<td>Having confidence in being able to do exercises correctly makes me more motivated to exercise each time.</td>
<td></td>
<td></td>
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<tr>
<td>N/A</td>
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<tr>
<td>37)</td>
<td>Working out in a small group (one, two, or three other people) makes the workout more enjoyable.</td>
<td></td>
<td></td>
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<tr>
<td>N/A</td>
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<tr>
<td>38)</td>
<td>Working out in a small group (one, two, or three other people) gives me more confidence in the exercises I am doing.</td>
<td></td>
<td></td>
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<tr>
<td>N/A</td>
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</table>
39) The more I feel fatigued, the less motivated I become to continue my workout.
N/A 1 2 3 4 5

40) I believe that daily exercise will increase my physical appearance in a beneficial way.
N/A 1 2 3 4 5

41) I primarily use the West Virginia University recreation center or exercise on my own to lose weight related to fat.
N/A 1 2 3 4 5

42) I primarily use the West Virginia University recreation center or exercise on my own to maintain my current weight related to fat.
N/A 1 2 3 4 5

43) I primarily use the West Virginia University recreation center or exercise on my own to lose weight related to fat and maintain muscle mass.
N/A 1 2 3 4 5

44) I primarily use the West Virginia University recreation center or exercise on my own to lose weight related to fat and increase muscle mass.
N/A 1 2 3 4 5

45) I primarily use the West Virginia University recreation center or exercise on my own to maintain weight related to fat, and increase muscle mass.
N/A 1 2 3 4 5

46) When I workout at the West Virginia University recreation center or exercise on my own, I like to watch myself in a mirror.
N/A 1 2 3 4 5

47) The quality and intensity of my exercise suffers or is less than usual when I perceive others are watching me.
N/A 1 2 3 4 5
48) I am comfortable asking other exercises for a spot or assistance with an exercise at the West Virginia University recreation center.
N/A 1  2  3  4  5

49) I exercise because it relates to a goal of mine.
N/A 1  2  3  4  5

50) I exercise because I believe it is good for my overall health regardless of my physical appearance.
N/A 1  2  3  4  5

51) I exercise because it relieves or lowers my perceived stress.
N/A 1  2  3  4  5

52) I exercise because I enjoy when other people comment on my physical appears in a positive way.
N/A 1  2  3  4  5

53) I tend to only do exercise that I enjoy to do
N/A 1  2  3  4  5

54) I will find alternate exercise to work a muscle or muscle group if I do not like a specific exercise.
N/A 1  2  3  4  5

55) I enjoy exercise.
N/A 1  2  3  4  5

56) I exercise outside as much as possible
N/A 1  2  3  4  5

57) I feel that when I exercise, I am missing out on social events/functions.
N/A 1  2  3  4  5

58) I feel that exercise takes time away from my friends or relationship partner.
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>59)</td>
<td>I identify myself as “active” “fit” or as an “exerciser”</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>60)</td>
<td>I enjoy when others describe me as “active” “fit” or as an “exerciser”</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>61)</td>
<td>The time I spend exercising puts me behind on my schoolwork.</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>62)</td>
<td>My GPA or work suffers because I exercise too much.</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>63)</td>
<td>I would exercise more if I had no school obligation.</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>64)</td>
<td>It is important to keep exercise as enjoyable as possible</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>65)</td>
<td>The majority of the time I spend at the West Virginia University recreation center or exercising on my own focuses on muscle growth.</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>66)</td>
<td>The majority of time I spend at the West Virginia University recreation center or exercising on my own focuses on cardiovascular endurance. (e.g. Running)</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>67)</td>
<td>The majority of time I spend at the West Virginia University recreation center or exercising on my own focuses on enjoyment of the activity.</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>68)</td>
<td>I focus more on the outcomes of my exercise, such as physical appearance and strength, more than enjoyment.</td>
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</tbody>
</table>
69) Having fun and enjoying my workout is more important than physical strength or appearance.

70) One reason why I exercise is because it will make me healthier as an older aged adult.

71) I feel motivated to exercise most days of the week.

Please list your 3 most important factors that influence you to exercise

1. 
2. 
3. 

72) I do not exercise as much as I would like to.

Please list your 3 most important factors that influence you not to exercise

1. 
2. 
3. 

73) I feel confident in myself as an exerciser.

Please list any or all reasons that lead to confidence or lack of confidence and note whether that reason gives you confidence or does not give you confidence

Directions: Please complete the following sentence for question 74.

74) I do or do not exercise because...
Appendix B

Cover Letter

Dear Participant,

This letter is a request for you to take part in a research project that attempts to identify the psychological factors influencing exercise behaviors among college students. This project is being conducted by Phillip Dillulio, Eric Jenkins, Fernando Said, Stuart Squires, and Tim Stamper, Sport and Exercise psychology undergraduate students at WVU with supervision of Dr. Vanessa Shannon, a professor of sport and exercise psychology in the College of Physical Activity and Sport Sciences. Your participation in this project is greatly appreciated and will take approximately 12 minutes to fill out the attached questionnaire.

Your involvement in this project will be kept as confidential as legally possible. All data will be reported in the aggregate. You must be 18 years of age or older to participate. I will not ask any information that should lead back to your identity as a participant. Your participation is completely voluntary. You may skip any question that you do not wish to answer and you may discontinue at any time. Your class standing will not be affected if you decide either not to participate or to withdraw. West Virginia University’s Institutional Review Board acknowledgement of this project is on file.

I hope that you will participate in this research project, as it could be beneficial in understanding what psychological factors influence regularly physical activity and what barriers are in the way of regular physical activity. Thank you very much for your time. Should you have any questions about this letter or the research project, please feel free to contact our professor Dr. Shannon at Vanessa.shannon@mail.wvu.edu

Thank you for your time and help with this project.

Sincerely,

Phillip Dillulio
Eric Jenkins
Fernando Said
Stuart Squires
Tim Stamper