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EASTERN KENTUCKY UNIVERSITY

Mental Health Related Benefits and Barriers of Exercise among College Students

Honors Thesis

Submitted

in Partial Fulfillment

of the

Requirements of HON 420

Spring 2021

By

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Mental Health Related Benefits and Barriers of Exercise among College Students

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It is very clear that college can be a very stressful time. These high levels of stress can lead to negative coping mechanisms. However, there is a positive coping mechanism: exercise. The purpose of this study is to examine mental health related benefits of exercise and discuss any differences between males and females. This study examined raw data from a previously done study with a large sample size of college students ($n=629$). The data included their answers to the Exercise Benefits/Barriers Scale (EBBS), along with other measures of fitness. The EBBS consists of forty three statements that the participants rated from strongly agree to strongly disagree. Of the forty-three statements, thirteen of them describe mental health benefits and data was only analyzed from these statements. The results found that females cited the statements “I enjoy exercise,” “My disposition is improved with exercise,” “Exercise helps me decrease fatigue,” and “Exercise allows me to carry out normal activities without becoming tired” significantly ($p < 0.001$) more than males. This study is significant in the field of exercise science because society often tends to focus solely on the physical benefits of exercise. However, the mental benefits of exercise are very important and need to be made clearer.

Keywords and Phrases: Honors thesis, undergraduate research, exercise, exercise motivation, mental health, stress, and anxiety.

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EXERCISE MOTIVATION

Introduction

Generally speaking, being a college student and attending college, can be a very stressful experience (Acharya et al., 2018). High levels of stress can unfortunately, lead to negative coping strategies such as alcohol use, drug use, and in extreme cases, suicide. However, there is a positive, healthy, free, and accessible coping mechanism: exercise. When thinking of exercise, the positive impact it has on a person's physical health often comes to mind, such as preventing heart attacks, improving cardiovascular health, increasing endurance, and increasing muscle strength, etc. However, one benefit of exercise that is often not acknowledged is the improvement it can have on a person's mental health.

Literature Review

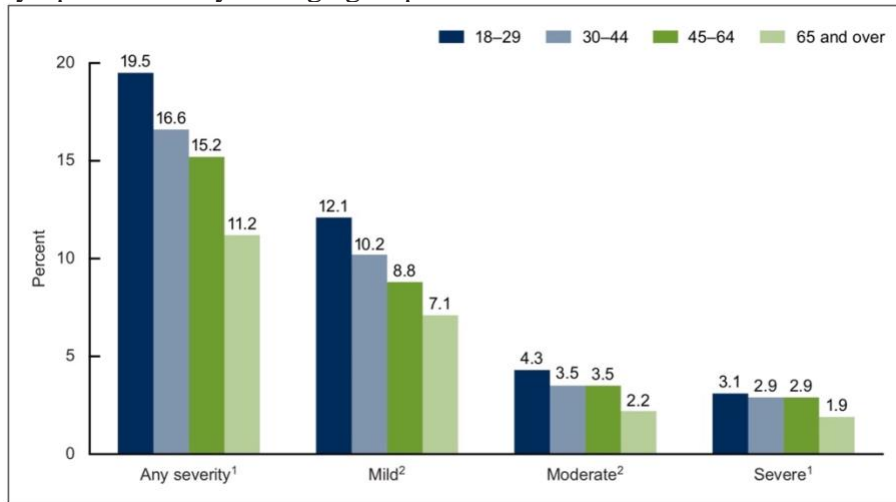
Stress is a common occurrence in everyone's life, especially college students. Stress is not always a bad thing, there are two different types of stress, distress and eustress (Branson et al., 2019). Distress is the negative response to stressors while eustress is the positive response to stressors. When distress occurs, it can often cause anxiety, is unpleasant, and leads to a decrease in productivity. When eustress occurs, it can often cause an increase in motivation, is usually considered pleasant, and leads to an increase in productivity. According to Holmes and Rahe (1967), the top ten stressors in the general adult population are death of a spouse, divorce, marital separation, jail term, death of a close family member, personal injury or illness, marriage, being fired at work, marital reconciliation, and retirement. Many college students struggle with stress and anxiety. According to Acharya et al. (2018), the top nine stressors in college are change in social

activities, work with people you don't know, increased class workload, change in eating habits, change in sleeping habits, lower grade than anticipated, vacations/breaks, change in living environment, and being placed in an unfamiliar situation. The goal is to maintain a healthy balance in one's life in order to increase eustress and decrease distress.

Excessive stress has a negative impact on overall health. According to the Harvard Mental Health Letter (2011), high stress levels over a prolonged period of time can lead to pathologic changes such as high blood pressure, formation of artery-clogging atherosclerosis, and chemical imbalances in the brain that can cause anxiety, depression, and addiction. This issue is especially important for females because they are more likely to report higher stress levels and mental health problems than males (VanKim & Nelson, 2013).

These stressors lead to anxiety which is something that almost everyone experiences. It has been shown 88% of college students reported having some degree of anxiety while 47% had "extremely severe" anxiety (Asif et al., 2020). A study done by Terlizzi and Villarroel (2020) showed the age group of eighteen to twenty-nine has the highest percentage of anxiety of any severity. This is seen in the table below which displays the percent of adults age 18+ with symptoms of anxiety in the past two weeks (see Table 1).

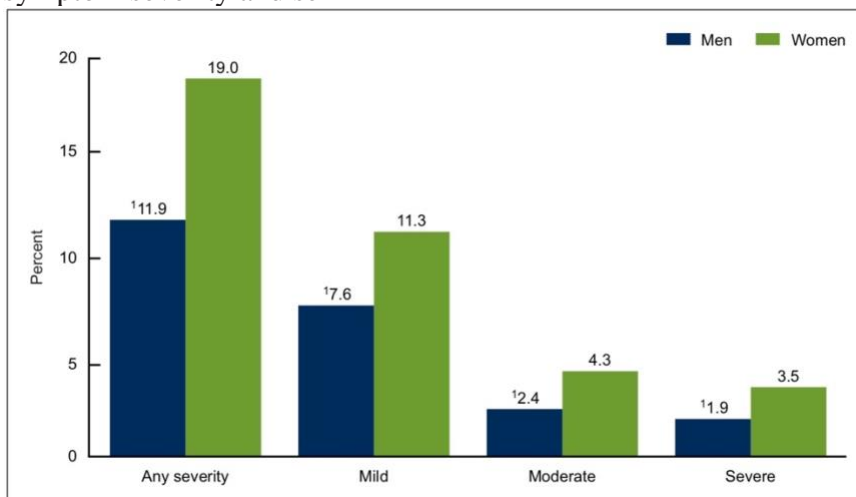
Table 1. Percent of adults who experienced symptoms of anxiety in the past 2 weeks, by symptom severity and age group.



Reference: Terlizzi and Villarroel (2020)

According to the same study done by Terlizzi and Villarroel (2020), women have the highest percentage of anxiety of any severity. This is shown in the table below which displays the percent of adults who had anxiety in the past two weeks (see Table 2). Clearly anxiety is problematic for a large portion of adults but is seen more frequently in college-age students and especially females.

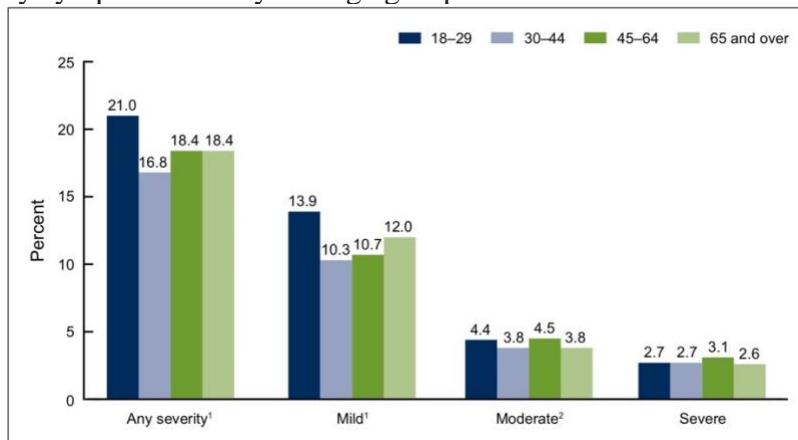
Table 2. Percent of adults who experienced symptoms of anxiety in the past 2 weeks, by symptom severity and sex



Reference: Terlizzi and Villarroel (2020)

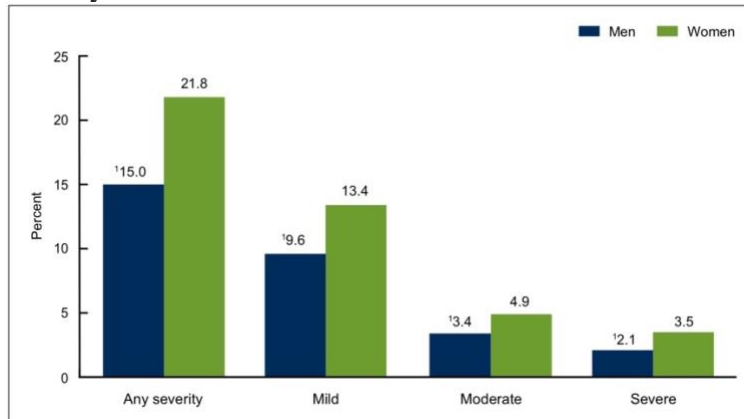
Along with anxiety, depression is very prevalent among adults in the United States with 72% experiencing a major depressive episode within the last year (Brody & Gu, 2020). A study done by Villarroel and Terlizzi (2020) showed the age group of eighteen to twenty-nine has the highest percentage of depression of any severity. It is evident that younger adults suffer with depression at higher levels than middle aged or older adult age groups (see Table 3).

Table 3. Percent of adults who experienced symptoms of depression in the past 2 weeks, by symptom severity and age group



Reference: Villarroel and Terlizzi (2020)

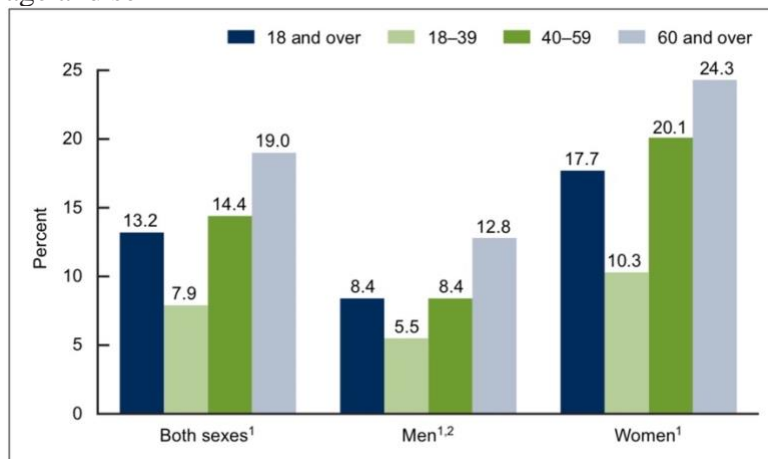
According to the same study done by Villarroel and Terlizzi (2020), women have the highest percentage of depression of any severity. This is clear in the table below which displays the percent of adults with symptoms of depression in the past two weeks, according to severity and sex (see Table 4). Women appear to have more depression than men be it mild, moderate, or severe.

Table 4. Percent of adults with symptoms of depression in the past 2 weeks, by symptom severity and sex

Reference: Villarroel and Terlizzi (2020)

A common treatment or coping mechanism for depression is the use of antidepressant medication. A study done by Brody and Gu (2020), found 8% of adults age 18 to 39 have used antidepressants within the last month and a higher percentage of women have used antidepressants than men. The table below shows the percent of adults who had taken antidepressant medication over past 30 days, according to age and sex (see Table 5).

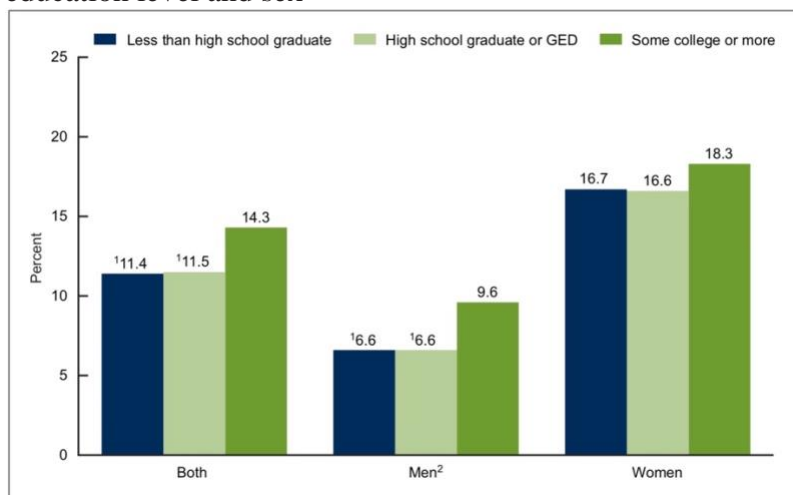
Women used more antidepressants than men at all age levels.

Table 5. Percent of adults who used antidepressant medication over the past 30 days, by age and sex

Reference: Brody and Gu (2020)

The same study by Brody and Gu (2020), found adults with some college education or more have a higher percentage of antidepressant use. Interestingly, women were more likely to take antidepressant medication over the past 30 days compared to men (see Table 6). It is clear that depression is a common problem in college age adults and these people are likely to turn to medications to cope.

Table 6. Percent of adults who used antidepressant medication over the past 30 days, by education level and sex

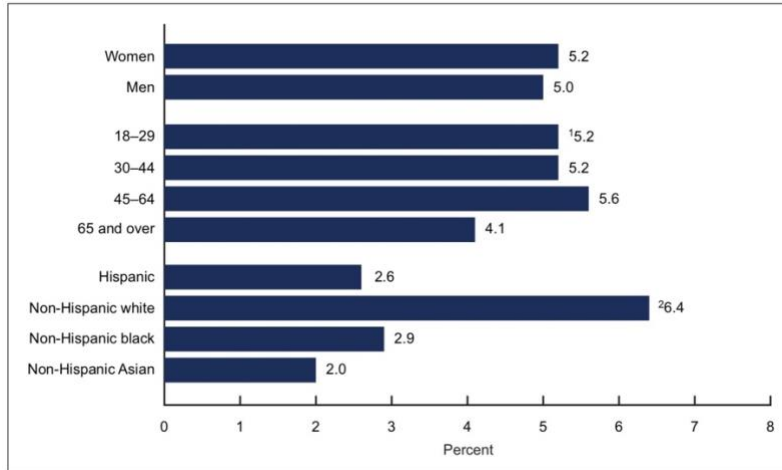


Reference: Brody and Gu (2020)

As a result of anxiety, stress, and mental health issues, students often turn to negative coping methods. Many students turn to alcohol to cope with high stress levels. Drinking alcohol is very prevalent in American culture, two thirds of adults have consumed alcohol within the past year (Boersma et al., 2020). According to Skidmore et al. (2016), 79% of college students engaged in alcohol use, 61% reported being drunk within the past year, and 31% of students met the criteria for alcohol abuse. Lawrence et al. (2010) found 40% of college students have engaged in “heavy episodic” drinking within the last two weeks.

A study done by Boersma et al. (2020) found females are slightly more likely to engage in heavy drinking and is shown in the table below (see Table 7).

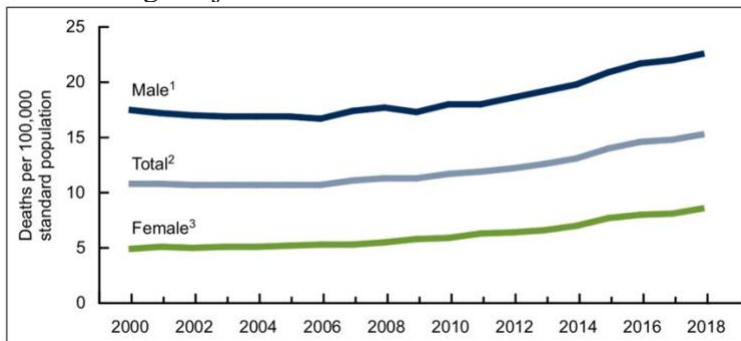
Table 7. Percent of adults who engaged in heavy drinking in the past year, by select demographic characteristics



Reference: Boersma et al. (2020)

This level of alcohol consumption can directly lead to death in some extreme cases. Alcohol induced deaths have increased 43% from 2006 to 2018 (Spencer et al., 2020). According to Spencer et al. (2020), males have a higher number of alcohol induced deaths with the number of deaths for both sexes increasing over the last decade, which is shown in the table below (see Table 8). Drinking is not a safe coping mechanism and the potential consequences can be devastating.

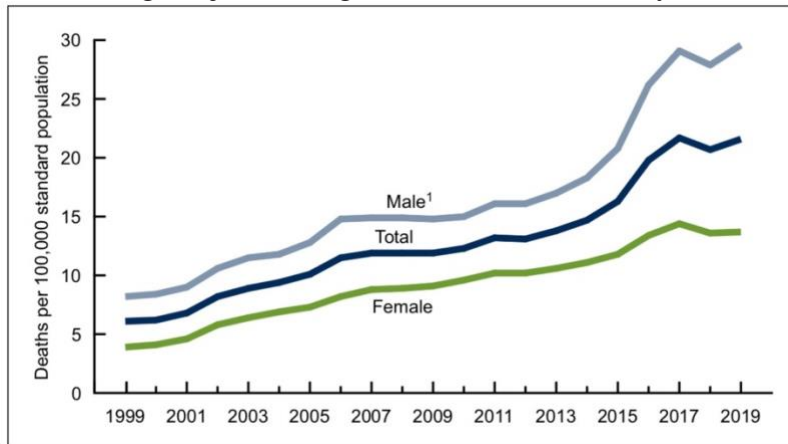
Table 8. Age-adjusted rates of alcohol-induced deaths among persons aged 25 and older



Reference: Spencer et al. (2020)

Another unhealthy coping mechanism is drug use. According to Skidmore et al. (2016), 39% of students reported illicit drug use, 34% used marijuana, 23% smoked cigarettes, 10% abused amphetamines, 4% stated they used cocaine, and 4% took hallucinogens. Drug use can become addicting and lead to overdoses that can cause death. A study done by Hedegaard et al. (2020) found drug overdose deaths have increased from 1999 to 2019 and can be seen in the table below which displays age-adjusted drug overdose death rates, according to sex (see Table 9). College students use drugs and/or alcohol for many reasons such as coping with stress, wanting to “feel good,” wanting to “escape,” lack of access to mental health resources, and young people often feel they are invincible. Unfortunately, there are many unintended consequences.

Table 9. Age-adjusted drug overdose death rates, by sex: United States, 1999-2019



Reference: Hedegaard et al. (2020)

Closely related to mental health issues is suicide. It has been reported 20% of college students have considered suicide (Reinberg, 2018). It has also been shown 17% of students have attempted suicide or had a self-injurious episode (Garlow et al., 2008). Tragically, in the most recent statistics on leading causes of death released by the CDC,

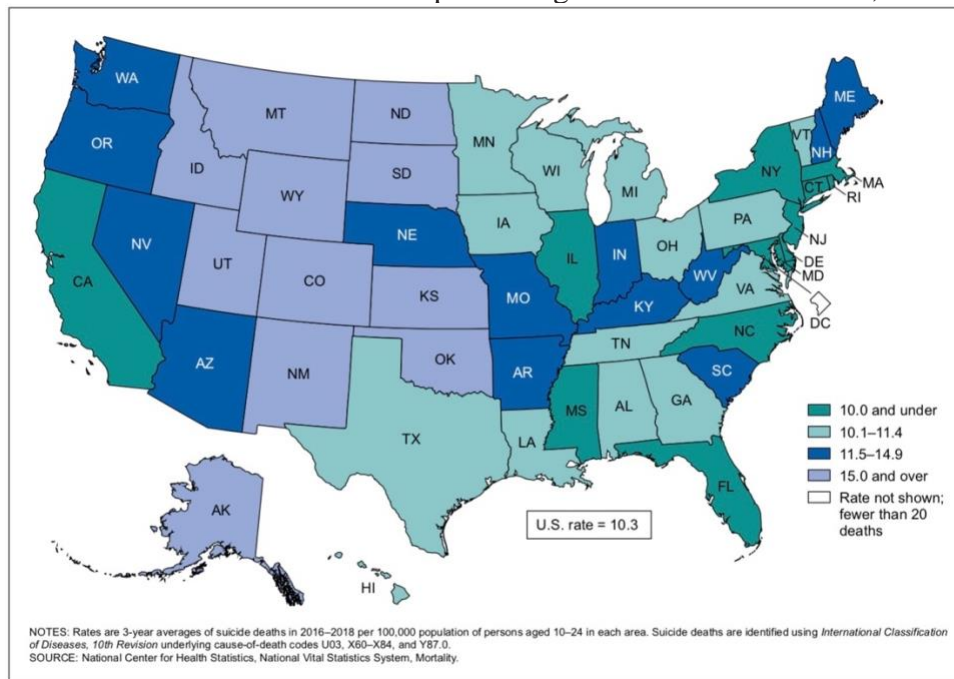
suicide was the second highest cause of death in people ages 15 to 19 and ages 20 to 24 (Heron, 2019). Suicide rates vary between males and females, with males being more at risk for suicide (Stephenson et al., 2005). Some contributing factors to this may be high stress levels, stressful life events, personality disorders, and other mental illnesses that tend to manifest at this age (Reinberg, 2018). According to Curtin (2020), the suicide rate has increased in Kentucky from 9% in 2000 to 13% in 2018 and is shown in the table below which displays suicide death rates among persons aged 10–24 in Kentucky (see Table 10).

Table 10. Suicide death rates among persons aged 10-24: Kentucky, 2000-2018

Area	Year																		2007– 2009	2016– 2018	Percent change between 2007–2009 and 2016–2018	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017				2018
Kentucky																						
Number	72	60	73	81	75	62	75	77	58	79	62	76	97	92	76	105	103	92	114	214	309	...
Rate	8.5	6.9	8.4	9.3	8.6	7.1	8.6	8.9	6.7	9.1	7.1	8.7	11.0	10.4	8.6	12.0	11.8	10.5	13.0	8.2	11.8	†43.9

Reference: Curtin (2020)

The suicide death rates in Kentucky are higher than the national average and can be seen in the table below which displays suicide death rates for persons aged 10–24 in the United States (see Table 11; Curtin, 2020). This is a problem that is not often talked about possibly because mental health issues are still often stigmatized. With resources for mental health treatment difficult to find and/or afford, college students must find healthy ways to cope with their stress and avoid maladaptive behaviors.

Table 11. Suicide death rates for persons aged 10-24: United States, 2016-2018

Reference: Curtin (2020)

In order to improve mental health among students, one beneficial coping method is exercise. Exercise has many positive effects on mental health. One way the neurological effects of exercise can be measured is through endorphin levels. Endorphins have the same effect as morphine on the body, they act as painkillers and can induce feelings of well-being. A study done by Schwarz and Kindermann (1992) showed both aerobic and anaerobic exercise resulted in an increased level of beta-endorphins in their participants. This can be a possible explanation for why exercise is often associated with an improvement in mood. In a meta-analysis done by Basso and Suzuki (2017), low, moderate, and high intensity exercise had a positive effect on mood and can also decrease stress levels.

Exercise has proven to be an effective treatment of anxiety disorders. According to Barney et al. (2014), physical exercise contributes to a decrease in stress, which can lead to a decrease in anxiety. A meta-analysis by DeBoer et al. (2012) found exercise lowered

anxiety and those who regularly exercise were less likely to be diagnosed with anxiety related disorders. Tyson et al. (2010) found students who participate in high levels of exercise had lower levels of anxiety and depression. According to DeBoer et al. (2012), there are many reasons exercise may be effective in combating anxiety including the release of neurotransmitters such as atrial natriuretic peptide, brain-derived neurotrophic factor, endorphins, and adenosine, all of these contribute to improved feelings of well-being. The increased core body temperature during exercise is also associated with decreased feelings of stress and anxiety. Exercise is associated with self-efficacy which may also lead to decreased anxiety (DeBoer et al., 2012). Some have even considered exercise to be a distraction from the stresses of everyday life and in effect alleviates anxiety. It is likely that a combination of these factors leads to decreased feelings of anxiety.

Not only can exercise be a treatment for anxiety, it also has been shown to improve cognitive function and prevent cognitive decline. According to Basso and Suzuki (2017), long term exercise can help to delay diseases such as Alzheimer's, Parkinson's, and Huntington's disease and can help improve symptoms in people who are already diagnosed with these diseases. Exercise can also improve cognition in healthy children and younger individuals, particularly functions of the prefrontal cortex. A meta-analysis done by Basso and Suzuki (2017) has shown different types or intensities of exercise can have beneficial effects on cognitive function. For example, moderate intensity exercise has been correlated with improved executive function. In a study done by Schwarck et al. (2019) it was found even one session of exercise can improve cognitive function. They

concluded different intensities of exercise led to varied types of cognitive function being improved such as attention, inhibitory control, and cognitive flexibility.

Another positive effect of exercise is decreased fatigue and tiredness. Certainly, exercise causes fatigue acutely in the short term after a workout. Chronically however, it is known that exercise helps to combat fatigue. According to Thayer (1987), moderate exercise leads to higher energy levels and lower tiredness as reported by their participants. It has been found that fatigue is highly correlated with anxiety and depression (Williamson et al., 2005). Although it may not be the root cause of mental health issues, decreasing fatigue can help improve physical and mental health.

Exercise participation rates are sadly, very low with only 44% of college students meeting the exercise recommendation for adults (Chu et al., 2019). In other words, less than half of college students are exercising as much as they should. This is a “significant health problem in the college population” (Kilpatrick et al., 2005, p. 87) because exercise is essential for optimal physical and mental health. It has also been found that men exercise more than women (Silliman et al., 2004). In a study done by Lovell et al. (2010), it was found college age females who do not exercise believed there were a low number of benefits and a high number of barriers to exercise. This is particularly worrying for college students because this age is often when young people are forming habits that they will keep for the rest of their lives. One of those habits should be adequate exercise. The first step in getting students to exercise is understanding their motivations for exercise. According to Chowdhury (2012), the exercise motivations among males and females are different with females’ primary motivator being appearance and males’ primary

motivator being social affiliation. College students need to be made more aware of the significant impact that exercise can have on their mental health.

Purpose

College students experience very high stress levels (Asif et al., 2020). They tend to rely on negative coping mechanisms such as alcohol, drugs, and suicide (Lawrence et al., 2010). Unfortunately, only 44% of students met the exercise recommendations for adults (Chu et al., 2019). Clearly there needs to be more research done on exercise motivation among college age people. These are critical and formative years where many habits are formed for the rest of their lives. Exercise should be included as one of those habits so that they can live a healthier lifestyle. The motivation for exercise participation needs to be investigated. The purpose of this study was to examine the mental health related benefits and barriers of exercise and sex related differences between males and females. Specifically, it was hypothesized that: (a) overall well-being will be viewed as more of a benefit of exercise by females; (b) the physical/mental connection will be viewed as more of a benefit of exercise by males; (c) enjoyment/positive feelings will be viewed as more of a benefit of exercise by females.

Method

Participants

Secondary data collected at Eastern Kentucky University at a fitness testing event (Fitness Five Assessment) was analyzed. The participants ($n = 569$) were undergraduate students, both male and female, ranging in age from 18 to 25 years old.

Procedures

The Fitness Five Assessment was a free fitness testing event open to any undergraduate student interested in participating. Prior to participating in the fitness testing, volunteers were given an informed consent/waiver/release form (see Appendix A). Students were asked to voluntarily fill out a brief 10-minute survey called the Exercise Benefits and Barriers Scale (EBBS; see Appendix B). Participants then went through multiple stations that measured the five components of health-related fitness (see Appendix C). The data collected also included the participant's BMI, body fat percentage, muscular strength, and muscular endurance.

Survey

The Exercise Benefits and Barriers Scale (EBBS; Sechrist et al., 1985) consists of forty-three statements, of these, twenty-nine measured exercise benefits and fourteen measured exercise barriers. The participants rate each statement as either *strongly agree* = 1, *agree* = 2, *disagree* = 3, or *strongly disagree* = 4. The EBBS addresses information about many different aspects of exercise. This study will focus solely on mental health so only questionnaire items that focus on mental health will be used. Of the forty-three items in the EBBS, thirteen of them describe mental health and will be analyzed. These questionnaire items can generally be categorized into these three categories.

Category one (I). Overall well-being. The questionnaire items in this category were:

- (a) "My disposition is improved with exercise"

- (b) “Exercise improves my mental health”
- (c) “Exercise improves overall body functioning for me”
- (d) “Exercising increases my mental alertness”

Category two (II). Physical/mental health connection. The questionnaire items for this category were:

- (a) “Exercise decreases feelings of stress and tension for me”
- (b) “Exercising makes me feel relaxed”
- (c) “Exercising helps me sleep better at night”
- (d) “Exercise helps me decrease fatigue”
- (e) “Exercise allows me to carry out normal activities without becoming tired”

Category three (III). Enjoyment/Positive feelings. The questionnaire items for this category were:

- (a) “Exercise gives me a sense of personal accomplishment”
- (b) “Exercising improves my self-concept”
- (c) “I enjoy exercise”
- (d) “I have improved feelings of wellbeing from exercise”

Statistical Analyses

The data was organized, “cleaned up,” transferred to an Excel file, and converted to SPSS. Means and standard deviations were calculated on the mental health related perceived benefits and barriers (13 items). T-tests were used to analyze the group differences between males and females. Significance will be set at a P-value of 0.05.

Assumptions

The following assumptions were made: (a) participants followed directions; (b) participants understood the questions being asked by the survey; and (c) participants truthfully answered all questions.

Delimitations

The current study was delimited to: (a) students age 18-25 attending Eastern Kentucky University; (b) volunteers who attended the Fitness Five Testing event; (c) students able to complete the testing protocol; and (d) participants who filled out the survey completely and correctly.

Limitations

Limitations of this study include: (a) the use of a convenience sample; (b) random sampling was not used and therefore the data will not provide a true representation of the population; (c) there may be self-reporting bias.

Results

The results of this study can be seen in Table 12 below. Females cited “*I enjoy exercise*” significantly ($p < 0.001$) more than males, this can be seen in line one of Table 12. The average rating of the statement “*I enjoy exercise*” for males was 1.733 and for females it was 1.954 with a p-value of 0.000691. Males cited “*My disposition is improved with exercise*” significantly ($p < 0.05$) less than females, this can be seen in line 7 of Table 12. The average rating of the statement “*My disposition is improved with exercise*” for males was 1.747 and for females it was 1.842 with a p-value of 0.0498. Females cited “*Exercise helps me decrease fatigue*” significantly ($p < 0.01$) more than males, this can be seen in line 9 of Table 12. The average rating of the statement “*Exercise helps me decrease fatigue*” for males was 1.909 and for females it was 2.08 with a p-value of 0.00548. Males cited “*Exercise allows me to carry out normal activities without becoming tired*” significantly ($p < 0.001$) less than females, this can be seen in line 12 of Table 12. The average rating of the statement “*Exercise allows me to carry out normal activities without becoming tired*” for males was 1.587 and for females it was 1.763 with a p-value of 0.000511 (see Table 12).

Table 12. Results of 13 EBBS mental health related questions, males vs. females

Q: #	Question: Text	Sex: Male	Sex: Female	Statistical P-Value
1	I enjoy exercise.	1.733	1.954	0.000691***
2	Exercise decreases feelings of stress and tension for me.	1.596	1.690	0.0692
3	Exercise improves my mental health.	1.595	1.693	0.0649
4	Exercise gives me a sense of personal accomplishment.	1.444	1.516	0.169
5	Exercising makes me feel relaxed.	1.923	2.046	0.0569
6	I have improved feelings of wellbeing from exercise.	1.611	1.668	0.259
7	My disposition is improved with exercise.	1.747	1.842	0.0498*
8	Exercising helps me sleep better at night.	1.681	1.678	0.951
9	Exercise helps me decrease fatigue.	1.909	2.08	0.00548**
10	Exercising improves my self-concept.	1.630	1.656	0.632
11	Exercising increases my mental alertness.	1.704	1.757	0.318
12	Exercise allows me to carry out normal activities without becoming tired.	1.587	1.763	0.000511***
13	Exercise improves overall body functioning for me.	1.562	1.655	0.0519

Key = $p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$

Discussion

These results were very surprising and led to the following conclusions. It was found females were more likely to cite, “I enjoy exercise” than males. Reasons for this could potentially be due to the positive effect that exercise has on anxiety levels. According to Barney et al. (2014), physical exercise contributes to a decrease in stress, which can lead to a decrease in anxiety. Also, exercise is associated with enhanced self-efficacy which may also lead to decreased anxiety (DeBoer et al., 2012). According to the current study, exercise professionals need to be sensitive to the fact that males are less likely to enjoy exercise. Therefore, we need to create exercise activities and programs that are fun, enjoyable, and appealing, especially for male participants. This is particularly interesting when you consider the fact that males are more likely to prefer sport participation (Chu et al., 2019). It has been found students who use sports for exercise report enjoyment as a main motive (Kilpatrick et al., 2005). Perhaps the reason males prefer sports is because

they are seeking a competitive form of enjoyment they are not getting from other modes of exercise.

There was a significant difference between males and females regarding how they felt in response to exercise. Males, interestingly, were significantly less likely than females to cite, “My disposition is improved with exercise.” According to Schwarz and Kindermann (1992) both aerobic and anaerobic exercise leads to an increased level of beta-endorphins in participants. This was true in both males and females. In the current study, males did not believe exercise improved disposition. Fitness professionals in the field of exercise and sport science need to design exercise programs with this in mind. Previous research has proven exercise has a beneficial impact on one’s mental state and can illicit positive changes in psychological affect (DeBoer et al., 2012).

In the current study, females cited “Exercise helps me decrease fatigue” and “Exercise allows me to carry out normal activities without becoming tired” significantly more than males. According to Thayer (1987), exercise improves energy level, combats fatigue, and helps individuals carry out activities of daily living (male or female). Interestingly, the current study concluded males do not consider exercise to be beneficial at reducing fatigue or tiredness or to help them carry out their normal activities. Certainly, exercise causes fatigue acutely in the short term after a workout. Chronically however, it is known that exercise helps to combat fatigue. It might be possible that males were overexerting themselves when they exercised. The job of fitness professionals should be to prescribe exercise programs using the optimal frequency, intensity, time, and type of physical activity in order to stimulate positive responses, while at the same time, avoiding excessive fatigue in participants. According to Silliman et al. (2004) men do exercise

“more frequently and at a greater intensity than women.” This may lead to the belief that exercise does not decrease their fatigue.

Overall, the current study found females significantly see mental health benefits as a greater motivator for exercise than males. Similarly, according to Lovell et al. (2010), females ranked psychological outlook as the second greatest benefit of exercise (right after physical performance). Lovell’s finding is congruent with the findings in the current study in that females see mental health related factors as more of a benefit of exercise than males. It is clear males and females differ in their motivation for exercise.

Chowdhury (2012) found social affiliation was the highest motivator for males and showed males are more motivated by extrinsic factors. Future research should gain a better understanding of these motivational factors and strive to increase the percentage of college students who regularly exercise.

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Appendices

Appendix A

Informed Consent, Waiver, and Release Form

Informed Consent, Waiver, and Release Form
FITNESS FIVE (F⁵) PROJECT

The Fitness Five (F⁵) Project strives to improve the nation's health by providing fitness testing and an opportunity to offer fitness education and assess personal progress in achieving fitness goals.

Right to Privacy and Confidentiality

By participating in the Fitness Five (F⁵) Project fitness testing event, you are consenting to having your personal fitness data (PFD) recorded and stored in a secure facility. Your PFD may include fitness measurements and also your responses to survey or interview questions. Although the data may be used for purposes of (1) research, (2) grant-writing, and (3) publications. No names will be associated with your PFD. Your information will remain confidential.

Right to End Participation

You are free to end your participation in the fitness testing at any time without consequences.

Cautions and Benefits

Because physical exercise can be strenuous and carries a slight risk of injury, participants in fitness testing are encouraged to be aware of their physical health and not to exceed their limitations. You agree that by participating in physical exercise, you do so **entirely at your own risk**. Individuals should consult with a physician before beginning any lifestyle change (exercise regimen or diet) that may affect their health. You agree that you are voluntarily participating in these activities and use of these facilities and premises **and assume all risks** of injury, illness, or death. We are not responsible for any loss of your personal property. You acknowledge that you have carefully read this "waiver and release" and fully understand that it is a **release of liability**. You expressly agree to release and discharge the Fitness Five (F⁵) Project, its collaborative partners, and designees from any and all claims or causes of action and you agree to voluntarily give up or waive any right that you may otherwise have to bring a legal action against the aforementioned parties for personal injury or property damage. To the extent that statute or case law does not prohibit releases for negligence, this release is also for negligence.

If any portion of this release from liability shall be deemed by a court of competent jurisdiction to be invalid, then the remainder of this release from liability shall remain in full force and effect and the offending provision or provisions severed here from.

By signing this release, I acknowledge that I understand its content and that this release cannot be modified orally.

Questions and Contact Information

If you have questions about the Fitness Five (F⁵) Project fitness testing event, its purposes, the types of information collected from participants, and how it may be used, please feel free to contact the following person: Jim Larkin, Ph.D.; 859-622-1893; jim.larkin@eku.edu.

Your signature here indicates that you have read and understand this informed consent waiver & release, and agree to participate in the Fitness Five (F⁵) Project fitness testing event.

Signature

Date

Appendix B

Exercise Benefits and Barriers Scale (Sechrist, et al., 1985)

EXERCISE BENEFITS/BARRIERS SCALE

Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statement by circling SA from strongly agree, A for agree, D for disagree, or SD for strongly disagree.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I enjoy exercise.	SA	A	D	SD
2.	Exercise decreases feelings of stress and tension for me.	SA	A	D	SD
3.	Exercise improves my mental health.	SA	A	D	SD
4.	Exercising takes too much of my time.	SA	A	D	SD
5.	I will prevent heart attacks by exercising.	SA	A	D	SD
6.	Exercise tires me.	SA	A	D	SD
7.	Exercise increases my muscle strength.	SA	A	D	SD
8.	Exercise gives me a sense of personal accomplishment.	SA	A	D	SD
9.	Places for me to exercise are too far away.	SA	A	D	SD
10.	Exercising makes me feel relaxed.	SA	A	D	SD
11.	Exercising lets me have contact with friends and persons I enjoy.	SA	A	D	SD
12.	I am too embarrassed to exercise.	SA	A	D	SD
13.	Exercising will keep me from having high blood pressure.	SA	A	D	SD
14.	It costs too much to exercise.	SA	A	D	SD
15.	Exercising increases my level of physical fitness.	SA	A	D	SD
16.	Exercise facilities do not have convenient schedules for me.	SA	A	D	SD
17.	My muscle tone is improved with exercise.	SA	A	D	SD
18.	Exercising improves functioning of my cardiovascular system.	SA	A	D	SD
19.	I am fatigued by exercise.	SA	A	D	SD
20.	I have improved feelings of well being from exercise.	SA	A	D	SD

21.	My spouse (or significant other) does not encourage exercising.	SA	A	D	SD
22.	Exercise increases my stamina.	SA	A	D	SD
23.	Exercise improves my flexibility.	SA	A	D	SD
24.	Exercise takes too much time from family relationships.	SA	A	D	SD
25.	My disposition is improved with exercise.	SA	A	D	SD
26.	Exercising helps me sleep better at night.	SA	A	D	SD
27.	I will live longer if I exercise.	SA	A	D	SD
28.	I think people in exercise clothes look funny.	SA	A	D	SD
29.	Exercise helps me decrease fatigue.	SA	A	D	SD
30.	Exercising is a good way for me to meet new people.	SA	A	D	SD
31.	My physical endurance is improved by exercising.	SA	A	D	SD
32.	Exercising improves my self-concept.	SA	A	D	SD
33.	My family members do not encourage me to exercise.	SA	A	D	SD
34.	Exercising increases my mental alertness.	SA	A	D	SD
35.	Exercise allows me to carry out normal activities without becoming tired.	SA	A	D	SD
36.	Exercise improves the quality of my work.	SA	A	D	SD
37.	Exercise takes too much time from my family responsibilities	SA	A	D	SD
38.	Exercise is good entertainment for me.	SA	A	D	SD
39.	Exercising increases my acceptance by others.	SA	A	D	SD
40.	Exercise is hard work for me.	SA	A	D	SD
41.	Exercise improves overall body functioning for me.	SA	A	D	SD
42.	There are too few places for me to exercise.	SA	A	D	SD
43.	Exercise improves the way my body looks.	SA	A	D	SD

Appendix C

Fitness Testing Stations

