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The Association Between Attitudes Towards High Intensity Exercise and Self-Esteem

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Abstract

There has been much research that has examined the association between exercise and self-esteem. Specifically, research suggests that there is a positive association of high intensity exercise, including running, weight lifting, and interval training, with self-esteem in both children and adults. However, much of this past research involved experiments where an exercise regimen was introduced to test cause and effect of exercise and self-esteem. Further, much of the past research focused on adults outside of the United States (Hasanpour, Yiğiter, Yook). I aim to test whether there are associations of preferences for and attitudes towards high intensity exercise with self-esteem among adults based on their own self-reported attitudes and preferences. In this non-experimental study, I recruited participants through social media and via emails to participate in answering a survey that included measures of self-esteem and attitudes towards exercise. Based on past research, I hypothesized that there would be positive associations of participants' preferences for and attitudes towards high intensity exercise with self-esteem. I conducted correlational and regression analyses with survey responses from adults. I did not find a correlation between the preference for and tolerance of high-intensity exercise and self-esteem but I believe that this is because there is a difference between attitude towards exercise and the actual physical activity of exercise.

Keywords: attitudes, exercise, intensity, physical activity, preference, self-esteem

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The Association Between Attitudes Towards High Intensity Exercise and Self-Esteem

Past research on connections of high intensity exercise with self-esteem and other self-perceptions has found generally consistent results, with high-intensity exercise being positively associated with self-esteem (e.g., Legrand, 2014; Hasanpour et al., 2014; Yiğiter, 2014).

However, much of this research involved experiments in which participants were assigned to complete an exercise regimen to assess the effect of exercise on self-esteem. I aimed to study the associations of self-reported preferences for and attitudes towards exercise with self-esteem.

Much of the research that has been done on high-intensity exercise has either occurred outside of the United States (Hasanpour, Yiğiter, Yook) or has been an experiment that introduced some form of an exercise regimen in order to better test cause and effect. Specifically, I aimed to test the hypothesis that among adults, those who have a greater preference for high intensity exercise, as well as those who have greater tolerance for high intensity exercise, will have higher self-esteem.

My study focuses particularly on high intensity exercise, which includes circuit training, vigorous forms of weight training, and moderate-intensity exercises at a heart-pounding pace (Downing, 2017). High-intensity exercise can be distinguished from other exercise by an individual's maximum heart rate or the talk test. Maximum heart rate is found by subtracting an individual's age from 220. The talk test is a rudimentary way to measure how intense an exercise is by seeing how comfortably you can talk or sing while exercising. During high-intensity exercise, an individual's heart rate should be at about 75% to 80%, and they should not be able to say more than a few words (Downing, 2017). Exercise is a more general term focusing on any physical exertion of the body.

This study is important because it may lead to a better understanding of why exercise is important outside of the physical aspects. People are often told that they should exercise because it is good for their heart, their blood pressure, or their cholesterol, which is all true (“Physical Activity”, 2018) and may be important motivating factors for people; however, my study may lead to more reasons to exercise and may show that exercise is also important for mental health. This study may also lead to a better understanding of how mental health, specifically self-esteem in this case, may be influenced by high-intensity exercise.

This study is also important because it can inform important changes in programs, such as better gym classes for all ages so that kids can start exercising at an intensity that will be most beneficial to them at an early age and take those skills into adulthood. After World War II, schools became more invested in the physical health of their students (Martin, 2014). According to the United States President’s Council on Fitness, Sports and Nutrition in the 2006 School Health Policies and Programs Study, 95% of high schools and 84% of middle schools require physical education. However, only 69% of elementary schools require some form of physical education (Martin, 2014). My study may motivate individuals to create more efficient and widespread, if not mandatory, physical education programs that incorporate high-intensity exercise. The main goal of my study is to explore the benefits of exercise outside of physical aspects, such as weight loss.

The Brain and Exercise

That exercise has a chemical effect on the brain is well-established (Warren, 2017). Beurskens and Dalecki (2017) examined the effect of physical activity on an aging brain, as “aging is accompanied by a distinct performance loss in motor and cognitive functions” (p. 195). Based on examination of the literature, Beurskens and Dalecki (2017) concluded that physical

activity such as cardiovascular training or strength training can prevent function impairments in motor and cognitive performance and can counteract the decay of the outer layer of the cerebrum that occurs in aging.

Further, physical activity can have a positive impact on the brain, which can lead to improvement in physical activity and mood. Lorenz et al. (2017) completed an experiment on individuals who suffered from chronic moderate-to-severe brain injury in order to study the effects of planned and systematic physical activity. This is important because, as mentioned above, human motor performance is under control of higher-order cognitive processes in the brain (Beurskens & Dalecki, 2017). Lorenz et al.'s (2017) hypothesis was that moderate-to-intensive physical activity would be associated with improvements in impairment. In this study, there were 14 participants who lived in group homes. The participants exercised for 60 to 90 minutes three days a week for six days. The same measures were administered at the beginning of the experiment, at week six into the program, and at week twelve. The measures included the 6 Minute Walk Test, High-level Mobility Assessment Tool, the 10 Meter Walk Test, and a brief survey and semi-structured interview guide with participants, family members, and staff. Lorenz et al. (2017) found that there was significant detectable change at twelve weeks, including for mobility. This shows that physical activity is connected to brain function, as the participants had lost mobility because of a traumatic brain injury and experienced slight improvements in mobility as a result of exercise. Further, the social aspects of exercising, such as the group format and the trainers, were highly motivating for the participants (Lorenz et al., 2017).

One of the most common things that people associate with exercise is endorphins. Endorphins are hormones that get released in response to pain but are also triggered by actions like physical activity or laughter (Dunbar et al., 2012; Kolata, 2008). They may produce

euphoria. One example of the euphoria one feels because of exercise is a “runner’s high,” which is a feeling of euphoria and resistance to pain during and shortly after running (Kolata, 2008). The runner’s high occurs because muscles are operating without enough oxygen. So, there is a link between exercise and the brain, and because the brain controls every aspect of our experiences, including self-esteem, it may be that exercise is associated with self-esteem through effects on the brain.

Exercise and Well-Being

Exercise of any kind is known to have many physical health benefits, such as controlling weight, reducing risk of cardiovascular disease and reducing risk of type 2 diabetes, among others (“Physical Activity,” 2018). Exercise is also thought to have positive effects on psychological outcomes like stress and general well-being (Weir, 2011). Well-being is a broad concept that includes happiness as well as other factors that make up a good life, and it includes both affective and cognitive processes (Diener Oishi & Lucas, 2003). Past research has found that exercise has positive associations with indicators of well-being. For example, Skead and Rogers (2016) conducted a comparative study with 59 law school students from The University of Western Australia and 76 psychology students from Edith Conwan University, which are both schools located in Australia. They focused on these comparison groups because it is suggested that students studying law experience higher levels of stress, anxiety, and depression than other students pursuing other professional degrees (Tang & Hall, 2011). Both groups of participants were invited to complete an online survey at the end of the second semester in their programs, which in Australian schools begins in July and ends in October. Participants were asked how they were feeling emotionally during the previous semester (happy, worried, calm, sad, confident, and afraid) as well as how they were feeling physically during the semester (healthy,

lethargic, strong, unfit, energetic, and tense). The participants were also asked how often they had engaged in light, medium, or heavy exercise throughout the semester (never, once or twice, a few times, about once a week, multiple times per week, or daily). Skead and Rogers (2016) found that the frequency of exercise had a negative association with physical and psychological distress, but that medium to heavy exercise specifically had a stronger negative association with physical distress than light exercise among the law school students.

Research has also found that exercise that involves a community is beneficial to students' well-being. For example, Rourke and Wilson (2017) conducted an experimental study with the New South Wales Police Citizens Youth Club that included participation in sports such as basketball and football, non-contact boxing drills, team games such as dodgeball, and non-team games such as tag. The fitness course was a total of four weeks and was focused on getting kids active while building their skills, character and leadership. Fifty participants between the ages of 13 and 18 signed up for the course, but 11 participants dropped the course and ultimately 31 completed the survey. Participants were asked to complete a measure of well-being before the program began, in order to create a baseline for the participant's well-being, and then again after participating in the course. Roughly three quarters of the participants reported that they felt more confident after they completed the course, and four out of five participants reported feeling more cheerful and more willing to try new things after the course (Rourke & Wilson, 2017).

Research has also suggested that programs that reach out to people via email to encourage exercise can influence psychological well-being and a healthy lifestyle. For example, Torniainen-Holm et al. (2016) conducted a longitudinal study with participants who were recruited through a Finnish reality television program that aired between October 2012 and January 2013 "which focused on promoting resilience to daily stressors, optimism and

gratitude.” (p. 2) Each of the episodes would feature a Finnish celebrity being trained by an expert to improve their own well-being and daily life. Included in the television program was a freely accessible website in which people could test their health, well-being, lifestyle, and stress coping. If participants wished, and were over the age of 18, they could provide their email address to participate in a questionnaire used in the study to test the effectiveness of an assignment that participants were sent via email that included an exercise regimen they referred to as an Internet-based intervention. Participants who completed the first questionnaire were also contacted to complete follow-up surveys two months after the baseline survey, and again two years after the baseline survey.

All together, 73,054 participants completed the baseline questionnaire, 42,761 (58.4%) entered the training (known as the Electronic Health and Wellbeing Check and Coaching), and those who did not enter the training served as the control group (Tornianinen-Holm et al., 2016). In the final follow-up two years after the baseline survey, 84.9% participants remained in the intervention group and 84.1% of participants remained in the control group, so approximately 15% of the initial participants did not complete the final survey. Participants enrolled in the Internet-based intervention program were sent 17 emails that included a paragraph of background information to a theme and a link to a video with a workout assignment. Although on average participants reported that they had not done the exercises exactly as instructed, both the intervention group and the control group saw an improvement in levels of stress. The intervention group, however, showed more of an improvement than the control group. The individuals who were in the intervention group also saw the most sustained improvements at the two-year follow-up.

Overall, research suggests that exercise has positive consequences for well-being in

general, whether it is among people who are overweight and go through an exercise regimen or people who are getting exercises sent to them via email to motivate them to do the exercise. Self-esteem, as noted above, is an important component of overall well-being, which I focus on for the current study.

Self Esteem, Weight Stigma, and Body Positivity

Current attitudes toward exercise may be influenced by the current climate in the United States related to weight stigma and body positivity. Weight stigma is defined as “the devaluing of individuals with overweight and obesity and forms the basis of discrimination in a number of life domains” (Puhl & Heuer, 2009, p. 1). In recent years, especially as recent as 2015, the United States has seen a marked increase in a body positivity movement in which individuals are trying to radically re-imagine how American culture views bodies, moving from a society where differences are ranked to one where they are celebrated (The Body Positive, 2018). This is not to say that individuals in the body positivity movement denounce exercise; in fact, one of the most outspoken individuals regarding the body positivity movement is a yoga star made famous on the social media platform Instagram, Jessamyn Stanley (Brennan, 2017). Stanley posts videos and pictures of her doing yoga poses that take years to master and flows to communicate to her followers that, even if one may not look stereotypically athletic, that does not mean they are not or cannot be athletic.

However, there has been some backlash towards the body positivity movement. The backlash centers around the use of the phrase “body positivity” for women who are considered to have the ideal body type. Jaime Feldman, a writer for Huffington Post wrote in her article “Honestly, The Term ‘Body Positive’ Lost Its Meaning A Long Time Ago” an issue that arose from fitness guru Louise Thompson, who wrote a novel titled *Body Positive*. As pointed out in

Feldman's article, Thompson is thin and in shape. Thompson was criticized for distorting a movement not meant for people like her, and people criticized the Body Positivity Movement for becoming too accepting of bodies that are already looked upon favorably. The Body Positivity movement is changing the way many people feel about their bodies, which is good. However, if women who are considered thin and healthy are being ostracized for participating in the body positivity movement, people may be less likely to work out for fear of that same negativity. Or, people who choose to workout may be criticized by people who are using the body positivity movement to justify not exercising at all. Plus size model Ashley Graham began to lose weight as a result of diet and exercise and was critiqued for it with comments such as "I am no longer a fan of yours. You betrayed a lot of people!" (France, 2016). These dynamics can potentially influence people's attitudes toward exercise in addition to how they feel about themselves.

Despite the body positivity movement, there is still substantial stigma in society based on weight, which most often targets people who are overweight. Pearl et al. (2015) aimed to study the impact of weight stigmatizing media on exercise intentions, motivation, and behavior. Weight stigma can be communicated through news media, movies that involve weight-based humor, and reality television shows such as *The Biggest Loser* in which participants compete to lose the most amount of weight in one television season, all of which portray obesity in a derogatory manner, despite good intentions. Evidence suggests that greater personal experience with weight stigma is associated with decreased motivation to work out (Pearl et al., 2015). On the other hand, some research suggests that there is not a significant association between past experiences with weight stigma and current exercise habits (Vartanian & Novak, 2011). Due to the mixed evidence, Pearl et al. (2015) conducted a study on how the media, specifically reality television shows, affect health. Participants of the study mentioned above included 74 women

recruited from a community surrounding a university via flyers and Craigslist postings. The participants had a variety of body types. During the experiment, participants viewed a ten-minute video clip of popular media that featured “overweight women being mocked, humiliated, and disparaged for their weight” (Pearl et al. 2015, p. 1006). Participants then completed measures of exercise intentions, exercise avoidance, and self-esteem. Greater frequency of past weight stigma was associated with worse psychological well-being. Further, past weight-stigmatizing experiences and exposure to the weight-stigmatizing video correlated significantly and positively with exercise intentions but negatively with a drive for thinness. Their findings suggest that past experiences with weight stigma interact with exposure to weight-stigmatizing media (such as *The Biggest Loser*) and may increase the intention to exercise, but also may increase a drive for thinness that may have long term negative health consequences (Pearl et al. 2015).

Weight stigma may also negatively affect overweight individuals by leading them to internalize society’s negative beliefs about being overweight, and this internalization may lead to problems such as eating disorders, poor body image, and poor psychological functioning (Durso, Latner & Ciao, 2016). Body positivity is relevant to self-esteem, and the movement has seemingly improved the self-esteem of many individuals who may not have felt confident about themselves due to societal weight stigma. This is important to this study because, as mentioned above, the current climate in the U.S. related to weight stigma and body positivity may influence people’s attitudes toward exercise as well as their self-esteem.

Low-Intensity Exercise and Self-Esteem

As mentioned above, my paper will focus on high-intensity exercise and self-esteem, or exercise that causes an individual’s heart rate to be at 75% to 80%. However, before discussing

high-intensity exercise specifically, I believe it is important to discuss low to medium moderate exercise first.

Yoga and walking can be considered high-intensity depending on the type of yoga or walking that is done, but generally both yoga and walking are considered low-intensity exercise (Crawford, 2017). Elavsky and McAuley (2007) studied the effects of yoga on self-esteem in menopausal women. One of the common negative psychological consequences in menopausal women is the decrease of self-esteem. In Elvasky and McAuley's (2007) study, the participants were 164 sedentary or low-active women between the ages of 42 and 58 who were experiencing symptoms of menopause such as hot flashes. Participants who experienced surgical menopause (e.g., women who had hysterectomies) and women who had used hormone replacement in the last six months were excluded. Women who were using medication or other therapies for menopause were not told to stop but were instructed to not start any new therapies for the duration of the trial. Participants reported their demographics and health history, menopausal status, physical activity, cardiovascular fitness, body composition, their self-esteem, and their self-efficacy before the experiment began. Women then began two different four-month exercise programs. The aerobic exercise group met three times a week for one hour and walked around the track of a large gymnasium. The yoga group, which was a separate group, met twice a week for 90 minutes to practice Iyengar yoga, which "places special focus on developing strength, stamina, flexibility and balance, as well as concentration and meditation" (p. 86). Both groups kept exercise logs. Neither the walking group nor the yoga group had an increase in self-esteem, but they had improved feelings towards physical self-efficacy and body attractiveness.

In the United Kingdom, Reed et al. (2013) wanted to focus on the effect that exercising in an outdoor space had on self-esteem and mental health. In a movement referred to as "Green

Exercise,” Reed et al. (2013) proposed that individuals would experience an increase in self-esteem by relying on the environment for enjoyment and distractibility, which they believed would lead to people feeling better about themselves. They also hypothesized that being outdoors would distract the individuals from feeling fatigue. Participants in this study were children between the ages of 11 and 12. Participants completed a questionnaire on what they thought their habitual physical activity was, a 20-meter shuttle run, a FITNESSGRAM PACER test (a running test with increasing difficulty), the Rosenberg Self-Esteem Scale, and the Ratings of Perceived Exertion scale (used to evaluate how hard participants feel they are working). During the experiment, each child was asked to run a standard distance of 1.5 miles either indoors (the control group), or outdoors (the experimental group). Over the course of the experiment, the researchers found that there was a significant increase in self-esteem after completion of the run in both the rural and urban settings, but there was no significant difference in self-esteem because of being outdoors versus being indoors. Rather, the run as a whole increased the children’s self-esteem, not the environment.

Yook, Kang, and Park (2017) also studied yoga in order to study the effects of combining a new sport with mindfulness yoga on psychological characteristics in adolescents. Forty six students (23 in the experimental group and 23 in the control group) between second and fourth grade who attended an elementary school in Seoul, South Korea, were asked to participate in a study (with consent from their parents). Participants were first asked to fill out a Korean translated version of the Rosenberg Self-Esteem Scale, a Korean translated version of the Block and Kremen Ego-Resiliency Scale and a Korean version of a psychological well-being scale. Students then began the 8-week physical activity program. The new sport, as it is referred to, is a 5 minute warm-up, a 25 minute program, and a ten minute cool down. For the first four weeks,

the program consisted of various running activities and the last four weeks, the program was Kinball (a teamwork sport similar to volleyball with a giant ball). The new sport was combined with yoga. The new sport and yoga were practiced once a week respectively. Yook, Kang and Park's (2017) findings suggest that, even though there were no significant differences between the experimental group and the control group, each group had significantly increased self-esteem after the 8-week exercise regimen, suggesting that it is important to consider how psychological factors play a part in planning and implementing a physical activity program and not just the physical activity itself.

Low-intensity exercise is extremely valuable to older adults, which is particularly important as the number of individuals over the age of 65 is expected to double by the year 2050 (Awick et al., 2017). Awick et al. (2017) conducted a six-month long experiment with 307 low-active adults above the age of 65 to see how the increased physical activity affected their self-esteem, self-perception, self-efficacy, and short physical performance battery (i.e., physical ability). Participants in the experimental group were to do an exercise via DVD video that focused on flexibility, toning, and balance. The participants in the control group were given DVDs on healthy aging. At the completion of the six-months, both the experimental group and the control group had significant increases in self-esteem. Their findings suggest that a DVD-delivered exercise intervention is efficacious for improving and maintaining subdomain and domain levels of self-esteem in older adults (Awick et al., 2017).

Walking, as mentioned above, is a low-intensity exercise. Walking is also recognized as one of the best forms of physical activity for adults (Morris & Hardman, 1997), Bergland, Thorsen, and Loland (2010) completed a study on walking outdoors among adults between the ages of 55 and 79 living in communities. Surveys were taken over the phone. For the dependent

variable, outdoor walking ability, the researchers asked the question: “What is the longest distance you can walk without a pause?” (p. 953). The participants were given seven possible answers and were split up into two groups of participants who could walk less than one kilometer and those who could walk further than one kilometer. To assess self-esteem, researchers used the Rosenberg Self-Esteem Scale. Based on the self-reported answers to the survey, Bergland et al. (2010) found that individuals who could walk further than one kilometer self-reported higher levels of self-esteem.

High Intensity Exercise and Self-Esteem

Past research suggests that there is a positive association between regular high intensity exercise and self-esteem among adolescents and adults. Goldfield et al. (2015) conducted a correlational study in Canada and found that obese adolescents who previously did not exercise had improved psychological health after completing 45-minute exercises at gym facilities four times a week for 22 weeks compared to a control group that did not complete any exercises. Another study conducted in Canada found that exercising at a high intensity was positively associated with self-esteem among undergraduate women (Wilson & Rodgers, 2002). Specifically, women enrolled in an exercise course at the University of Alberta completed their exercises for class, and at the end of ten weeks, reported their levels of self-esteem using the Physical Self-Description Questionnaire, and participants’ motivation was measured using the Behavioral Regulation in Exercise Questionnaire (BREQ). Wilson and Rodgers (2002) found that women who were more motivated to exercise had higher levels of self-esteem.

Several studies have also experimentally explored the connection between engagement in high intensity exercise and self-esteem among adults. For example, Legrand (2014) conducted a study at a French university with low-income women between the ages of 18 to 45 who reported

not being physically active (being physically active was defined as exercising for 30 minutes in succession at a moderate intensity level twice a week or more). For this study, participants completed a scheduled exercise class involving running, walking, calisthenics (exercises designed to develop physical health and vigor, usually performed with little or no special apparatus), and Zumba (a high intensity Latin dance workout). These participants reported an increase in self-esteem and physical self-perception over a period of 7 weeks in comparison to a group that did not complete an exercise class and were instead told they were put on a “wait list” (Legrand, 2014).

Another experiment took place in Iran with young women who had lost their immediate family because the researchers hypothesized that having immediate family, especially in a person’s adolescent years, promotes the development of self-esteem (Hasanpour, Tabatabaei, Alavi, & Zolaktaf, 2014). Participants were randomly sampled and randomly assigned to an experimental group that completed a high intensity exercise regimen that lasted for eight weeks, with three sessions per week and 60 minutes devoted to each session, or to a control group wherein the participants did not exercise at all. At the end of the eight weeks, there was significant improvement in the self-esteem among participants in the experimental group both immediately after the exercise regimen and one month after the regimen ended, but the control group did not show significant increases in their self-esteem over the same period of time (Hasanpour et al., 2014).

Another study conducted at Duzce University in Turkey also supported a positive effect of exercise on self-esteem (Yiğiter, 2014). Female university students were randomly assigned to an experimental or control group, with the experimental group taking part in regular exercise sessions in the university’s gymnasium for 60 minutes per day, three days per week for 12

weeks, whereas the control group was told to continue their normal daily lives and to avoid a workout that was similar to the experimental group (i.e., not high intensity exercises). It is suggested participants' self-esteem had increased significantly after the completion of the exercise program compared to their well-being before the experiment began.

These studies all support that engaging in high-intensity exercise is associated with higher self-esteem and can improve self-esteem over time. However, not all findings have been completely consistent. For example, an experiment completed at a Hungarian university found that regularly exercising at CrossFit gyms (high intensity, increasingly popular sport) had no significant association with self-esteem in a cross-sectional survey. Individuals who had been participating in CrossFit gyms in Norway completed questionnaires including the WHO-Five Well-being Index, the Positive and Negative Affect Schedule, the Rosenberg Self-Esteem Scale, the Body Image Ideals Questionnaire, the Body Awareness Questionnaire, and the Body Competence Scale (Köteles, Köllsete, & Köllsete, 2016). It was suggested that participating in CrossFit was not associated with self-esteem.

Although research has been conducted on the link between self-esteem and exercise, a lot of the studies included participants who were either children under the age of 18 or adults above the age of 60. For example, one study was carried out in an industrial school for male juvenile offenders (Hilyer et al., 1981). The participants completed an additional exercise regimen of running and weight lifting three times a week for 20 weeks, along with their normal physical fitness routine. Hilyer et al. (1981) found that the participants who completed the additional exercise regimen had higher levels of self-esteem at the completion of the experiment compared to a control group whose regular exercise regimen did not change.

Another study assessed the impact of exercise on the psychological well-being of low-

income Hispanic children (Crews, Lochbaum, & Landers, 2004). An equal number of 33 fourth grade boys and 33 fourth grade girls were selected to participate and were split into an experimental group that completed an aerobic exercise regimen for six weeks and a control group that did not participate in the exercises. Participants' levels of anxiety, depression, and self-esteem were measured before and after the treatment, and the experimental group reported higher self-esteem after completion of the six-week regimen than the control group (Crews et al., 2004).

Another study was conducted in a rural town in northern Mississippi and involved participants over the age of 60 (with a mean age of 72) completing questionnaires based on their relationship with physical activity and self-esteem, among other things (Moore, Mitchell, Beets, & Bartholomew, 2012). They found that there was a positive association between exercise and self-esteem in the community of residents above the age of 60 (Moore et al., 2012).

These studies taken together suggest that individuals generally have higher self-esteem after participating in high intensity exercises. However, more research is needed to address these associations among individuals between the ages of 18 to 60. Also, I aimed to address if preference and tolerance for high intensity exercise, rather than participating in an assigned exercise regimen in an experiment, are related to self-esteem.

Hypothesis

To build on and expand the existing research reviewed above, I aimed to test in an online, cross-sectional, correlational survey study if there are associations of preference towards and tolerance for high intensity exercise with self-esteem among adults. Based on past research, I hypothesized that there would be positive associations of preference for and tolerance for high intensity exercise with self-esteem. The results of this study can help to inform the public about

possible benefits of exercise outside of physical appearance and health, and thereby potentially encourage people to exercise more.

Method

Participants

For the current study, we recruited a total of 289 participants by posting an online link to the survey. After excluding incomplete questionnaires, the study was left with a total of 188 participants. Mean age of participants was 23.01 (SD =8.36). Participants consisted of 26.1% (n=49) men, 71.3% (n=134), women 0.5% (n=1) transgender man, 0.5% (n=1) transgender woman, 1.1% who identified as *other*, and 1 participant who did not answer the question. In terms of race/ethnicity, 61% (n=112) of participants identified as White or European American, 8.5% (n=16) of participants identified as Hispanic or Latino, 4.3% (n=8) identified as Black or African American, 1.1% (n=2) identified as Native American, 11.2% (n=21) identified as Pacific Islander or Asian, and 13.3% (n=25) identified as other. In addition, 72.3% (n=136) indicated that they grew up in the U.S.

Procedure

Potential participants were directed to a link to the survey in recruitment efforts disseminated via email or social media, including Facebook and Twitter, which invited people to participate in a brief (approximately 10-15 minutes) online survey on factors associated with self-esteem. Potential participants who clicked on the link were first taken to a consent form. If they did not wish to consent, they were asked to close the window or tab to the survey. If they did wish to consent, they were asked to click a button to indicate this, and then were brought to a screening question that asked for their age, their gender, their race, and whether or not they had grown up in the United States. If they were younger than 18, they were told that they were not

eligible to complete the survey. If they were 18 or older, they were then directed to the survey questions. When participants completed the survey, they were thanked for their time. Participants were not compensated for their participation.

Measures

This was a cross-sectional correlational survey study. My independent variables were measured using the Preference for and Tolerance of the Intensity of Exercise Questionnaire, also known as PRETIE-Q (Ekkekakis, Hall, & Petruzzello, 2005). The PRETIE-Q is a 16-item scale broken into two subscales: preference for and tolerance of exercise. The PRETIE-Q determines a participant's preference and tolerance for high-intensity or low-intensity exercise and their tolerance for exercise in general. Participants usually respond to items on a Likert scale with 1 being "I totally disagree" and 5 being "I totally agree." However, I removed the "neutral" option, and had participants in this study answer on a Likert scale with 1 being "I totally disagree" and 4 being "I totally agree." An example item is, "The faster and harder the workout, the more pleasant I feel" (Ekkekakis et al., 2005). The participants were told to answer every question truthfully, and that there are no wrong answers. The PRETIE-Q itself has been found to have good face validity, structural validity, internal consistency (Cronbach's alphas = .85, .83, and .81), test-retest reliability, concurrent validity, and construct validity (Ekkekakis et al., 2005). The final scores for the two subscales from the PRETIE-Q were calculated with a mean of all of the items in each subscale. The cronbach's alpha for the subscale regarding preference for high-intensity exercise in this study is .86 and the cronbach's alpha for the subscale regarding tolerance for high intensity exercise in this study is .88.

My dependent variable, self-esteem, was measured using the Rosenberg Self-Esteem Scale, which is widely used to measure adults' self-esteem (Rosenberg, 1965). It is a 10-item

measure with responses on a Likert scale ranging from 1 being “strongly agree” to 4 being “strongly disagree.” An example item is, “On the whole, I am satisfied with myself” (Rosenberg, 1965). As appropriate, some items were reverse-scored. Like the PRETIE-Q, the participants were told to answer every question truthfully, and that there are no wrong answers. The Rosenberg Self-Esteem scale has been found to be valid and reliable with a Cronbach’s alpha anywhere between .77 and .88 (Rosenberg, 1965). All the items were summed to create a composite score, with higher scores indicating higher self-esteem. The higher the number found, the higher the level of self-esteem the participant reported. The cronbach’s alpha for Rosenberg’s self esteem scale in this study was .90.

At the beginning of the survey, participants reported their age, gender, racial or ethnic background, and whether or not they grew up in the United States. Participants did not report their education level or sexual identity.

Results

Table 1 shows bivariate correlations, means, and standard deviations for all variables. On a scale of 1 to 4 for each item in the survey, the tolerance for exercise total had a mean of 2.52 and a standard deviation of 0.57. The preference for exercise had a mean of 2.48 with a standard deviation of .49. Self-esteem had a mean of 2.84 and a standard deviation of 0.58. Neither of the independent variables, preference for exercise and tolerance of exercise, were significantly correlated with self-esteem. However, as shown in Table 1, preference for exercise and tolerance of exercise were positively correlated with each other, which was to be expected.

Then, a linear regression was calculated to predict self-esteem based on preference for and tolerance of exercise as simultaneous predictors (Table 2). I did not find a significant regression, $F(2, 132) = 1.138$, $p=.138$ and $p=.269$, with an R^2 of .01. Consistent with the bivariate

correlations, neither preference for exercise nor tolerance for exercise was significantly associated with self-esteem in the regression analysis.

Discussion

This study was a cross-sectional survey exploring attitudes towards high-intensity exercise and the associations of preferences for and tolerance of high-intensity exercise with self-esteem. What made this specific study different from many of the other studies in this area of research was that it was correlational and based on self-report. Many of the other studies exploring the link between exercise and self-esteem included some form of manipulation; in many cases, an experimental group was given a certain exercise regimen and their self-esteem was reported at the beginning and at the end of the study, sometimes in comparison to a control group. Further, because there was a lack of research done on age groups between 18 to 60, I wanted to fill in the gaps of that research.

My hypothesis was that people who prefer and tolerate high-intensity exercise more would report higher self-esteem. However, I did not find any associations between these attitudes toward high-intensity exercise and self-esteem. This is inconsistent with other findings from experimental and survey research done both within the United States and outside of the United States because many of the studies involving exercise and self-esteem found positive associations between high-intensity exercise and self-esteem (e.g., Legrand, 2014; Hasanpour et al., 2014; Yiğiter, 2014). However, perhaps because I was only examining people's attitudes towards exercise rather than actual amount of exercise in connection to self-esteem, my results were inconsistent with the past research.

Further, many of the other studies conducted in regards to exercise and self-esteem were experiments. This means that the studies had some form of manipulation in many cases, a study

group was given a certain exercise regimen and their self-esteem was reported at the beginning and at the end of the study. These experiments could also show cause and effect, whereas my survey could only show potential correlations between preference for and attitudes towards high intensity exercise and self-esteem, and this design difference may also explain my findings being inconsistent with much past research.

Limitations and Directions for Future Research

There are also limitations to this study. These findings were not evaluated against a control group. In this particular study, people were told to report their attitudes toward high-intensity exercise on a Likert scale. Because this study was a cross-sectional correlational study and did not involve an experimental manipulation or control group, we cannot determine cause and effect, which in itself is a limitation.

Also, this study did not specify what low-intensity or high-intensity exercise was for the participants. The definition of “exercise” is different for many people. Some view exercise as weight lifting or running on a treadmill whereas others regard it as walking or biking from one area to another rather than taking public transportation. One of the limitations to the study is that exercise was never defined and was therefore subject to the participant’s attitude and interpretation. That is another difference between the experiments that involved exercise regimens. With a specific exercise regimen, it is easy to operationalize what exercise is and even go so far as to control the participant’s heartbeats per minute.

Further, in my study, I had no way of knowing if people were telling the truth in their survey. People are also more inclined to lie about working out. United Kingdom based personal training organization, Be a Better You – Training Ltd., conducted a study of 1,018 British gym-goers and found that 58% of participants lied about working out despite being members of gyms

(Turrill, 2016). It could very well be that participants in this study lied about their attitudes towards and preference for exercise for many reasons, one of them being that not exercising may be thought to equate an individual with being lazy. An article by Medical Daily titled “Lazy Boy: People Who Don't Exercise Twice As Likely To Develop Alcohol Abuse Problem” is one example of people equating not exercising to being “lazy.” Using that same article, people may also be inclined to lie about working out because of potential negative effects of not exercising. Either way, I cannot be certain that everyone in my study was telling the truth, which is a limitation in self-report surveys.

In the future, there should be more research done regarding individual’s attitudes towards high intensity exercise, and exercise in general. Because much of the research that has been conducted involves introducing an exercise regime, it is important to realize that exercise has benefits far beyond any correlations to self-esteem. It is also important to remember that experiments are short term and that, in order to see results, individuals should typically exercise for a longer period of time than given in an experiment. If these experiments last six weeks, we are unsure if the participants continue to exercise and how the exercise influences them in the long-term. It is important to study people’s attitudes (such as their preferences towards and tolerance for) exercise in general because, after any sort of experiment is over, it is up to the participants as to whether or not they are going to continue exercising to see how the exercise will influence people’s self-esteem. I think it would be beneficial for future research to be longitudinal studies if an exercise regimen was implemented. If it was a self-reported study on attitudes towards exercise, it would be important to define what the intensities of exercise are and what high-intensity exercise is and what low-intensity exercise is.

Strengths

A strength of the study is that it was not timed so people could complete it at their own pace. This allowed participants to think about the types of exercises they prefer and how they view themselves in the self-esteem scale without the pressure of a timer. This was important specifically because of the Rosenberg Self-Esteem Scale and the valance that the reverse questions tested for. Individuals needed to take time to answer the questions and ensure that they were answering the questions correctly so it was helpful to not have the pressure of an experimenter or a timer involved in the survey. It was also an online survey, so participants could take it whenever or wherever they wanted and could remove pressure from the environment the participant was in.

The Difference Between Attitude and Action

There are inconsistencies between the findings in past research and my own study in that I did not do an experiment. I did not require my participants to complete an exercise regimen so any of the participants relied on their own experience with exercise. I could not be sure that my participants were telling the truth in the survey. My study focused on individuals' preference towards and tolerance for the intensity of exercise. I cannot be sure that the participants actually exercised or just reported their attitudes towards exercise. This may be one of the reasons that led to my hypothesis not being supported. There is a difference between actually completing an exercise regimen and the attitudes towards completing an exercise, and maybe it is only engagement in actual exercise, not attitudes toward it, that is associated with self-esteem.

In 1975, Martin Fishbein and Icek Ajzen proposed their theory of reasoned action. It is one of the three classic models of persuasion and applies to all kinds of behaviors. Because of the rising obesity rates in the U.S., Bentler and Speckart (1979) conducted a study using the theory of reasoned action that suggested that intent to exercise was determined by a person's attitude

towards exercise. The theory of reasoned action proposes that an individual's decision to engage in a particular behavior is based on the outcomes the individual expects will come as a result of performing the behavior (Fishbein & Ajzen, 1975). Simply, in examining whether or not an individual will complete an exercise, they will weigh the possible benefits of exercising before they complete the task and, if the cons outweigh the pros, they will not exercise. This is significant to my own study because it can help to explain why completing a task is different from preferring one task over another, being able to tolerate one task over another, or having the intention to complete tasks. In my study, I cannot be sure that any action was completed, which may be related to why my findings did not support my hypothesis.

One factor that is involved in exercise is automaticity, or habit. In many exercise-based interventions, including experiments, people go through exercise regimens but will not participate in them for long enough to create a habit of it (Brujin, Gardner, Van Osch & Sniehotta, 2013). This decreases the likelihood that habit will be formed. This is significant to my own study because the PRETIE-Q had no way of figuring out how often the participants exercised, or whether or not they exercised at all. One can argue that if people are reporting their tolerance for a certain kind of exercise, it can show that they do, in fact, exercise. However, it could be very well that the participants exercised once or twice and reported answers to my survey based on those times. No matter how often the participants exercised, because the PRETIE-Q does not ask how often participants exercise, there is a chance that at least some of the participants in my study did not exercise at all and only reported how they hypothetically felt about exercise in general. It may be that there was no association found because there was no habit established just from one's preference and tolerance for high-intensity exercise.

Implications and Conclusions

My hypothesis was that people who prefer and tolerate high-intensity exercise more would report higher self-esteem. However, inconsistent with that hypothesis, I found that there was no association between these attitudes toward high-intensity exercise and self-esteem. There was a correlation found between the preference for certain types of workouts and the tolerance for the workout. If someone preferred a low-intensity workout such as yoga or walking, they also had a tolerance for that workout. That I did not find support for my hypothesis is inconsistent with other findings from studies, including experiments, conducted both within the United States and outside of the United States because many of the studies involving exercise and self-esteem showed a positive association between high-intensity exercise and self-esteem. However, perhaps because I was only examining at people's attitudes towards self-esteem, my data were inconsistent.

It is important to educate people, especially women and people under the age of 30 (which is what the majority of our participants identified as), about what exercise is. And, although this specific study did not find an association between attitudes toward high-intensity exercise and self-esteem, exercise has been found to increase and be positively associated with self-esteem in other studies (e.g., Crews, Lochbaum, & Landers, 2004; Goldfield, 2015; Hasanpour, Tabatabaei, Alavi, & Zolaktaf, 2014; Hilyer, 1981; Legrand, 2014; Moore, 2012; Wilson & Rogers, 2002; Yiğiter, 2014).

Based on the review of past research, there is an association between exercise, both low-intensity and high-intensity exercise, and self-esteem, especially when it is a controlled experiment where an exercise regimen is introduced. If the reason for this discrepancy between past research and my findings is that I only measures attitudes toward high-intensity exercise, this suggests it is important for interventions to focus on getting people to commit to engaging in

exercising, rather than just focusing on changing their attitudes toward exercise. Past research finding that exercise can improve self-esteem should help to give individuals the motivation to workout for other benefits besides physical benefits such as weight loss or muscle development.

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Table 1.

Means, Standard Deviations, and Correlations Among Study Variables

	Self-Esteem Total	Preference Total	Tolerance Total
Self-Esteem Total			
Preference Total	-.125		
Tolerance Total	.018	-.394**	
Mean	2.84	2.48	2.52
SD	0.58	0.49	0.57

** p is significant at $< .01$

Table 2.

Regression Analysis Predicting Self-Esteem

	Unstandardized Beta	Standard Error	t	p
Preference Total	-0.173	0.116	-1.494	.138
Tolerance Total	-0.040	0.099	-0.038	.2684