

## Are Students at Thiel College Getting Enough Physical Activity?

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### Abstract

As a species, humanity is built to move. It is in our anatomy to be physically active, and our bodies benefit from partaking in different forms of physical activity and exercise. However, modern society has created a world where a physically active lifestyle is a choice rather than a means of survival. No longer does mankind hunt, gather, and roam the earth in a nomadic lifestyle. The tools of modern society allow for a sedentary lifestyle which leads to a variety of issues for humanity as a whole. It is well known that heart problems, metabolic diseases, and other illnesses and ailments can stem from a sedentary lifestyle, and yet an alarming number of Americans do not achieve the adequate amounts of physical activity to try and prevent these issues. This thesis outlines the health issues that sedentarism causes, along with some specific causes of a physically inactive lifestyle. It then analyzes various domestic and global studies on how much physical activity people are getting and compares those values to the results of a survey of students at Thiel College in Greenville, PA. The comparison and the survey will attempt to identify what factors prevent or allow college students to achieve adequate levels of physical activity and exercise, along with proposing solutions to roadblocks that students at Thiel may face in leading physically active lifestyles.

### Framing the Issue

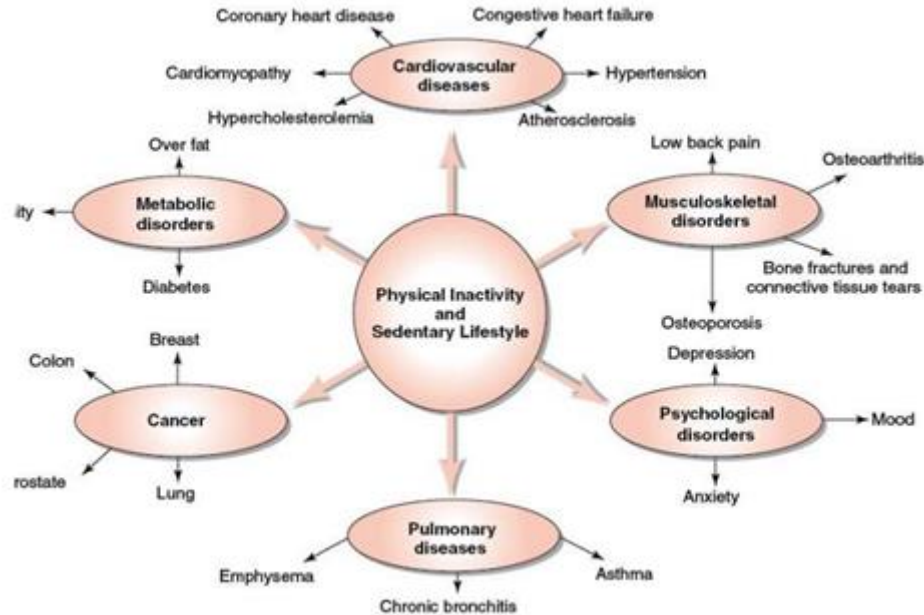
In the United States and worldwide, sedentarism and physical inactivity are two of the largest culprits to blame for a variety of health problems. Sedentarism is a term meaning a lifestyle with little to no physical activity (PA), generally involving a large amount of time sitting or lying down and is linked to an increased prevalence of noncommunicable diseases such as heart diseases, certain cancers, musculoskeletal injuries, obesity, and other issues (Gibson et al. 3). While these problems are considered noncommunicable diseases—meaning that they cannot be transferred from person to person—they have effects on more than just the individual with the disease. A 2016 Harvard study states that “by one estimate, the U.S. spent \$190 billion on obesity-related health care expenses in 2005-double previous estimates” (*Economic*). Not only are a large number of people physically inactive, which will be discussed later in this paper, but the effects of such inactivity impact people outside of those directly involved and call for serious solutions. Despite this fact, it is more common for people to discuss the direct, individual conditions that arise from a sedentary lifestyle.

One of the most discussed ailments correlated to sedentarism is obesity. Obesity is often referred to as an epidemic in the world of medicine. In the past 40 years, the number of people who classify as obese (recording a Body Mass Index [BMI] of 30 or above) has more than doubled worldwide (Gibson et al. 282-283). Those with a BMI of 30 and beyond usually have excess body fat, which is why BMI is the marker for obesity (Wolters 70). With things like transportation advancements, developments of calorie rich foods, and a declining level of physical activity, it shouldn't come as a surprise that levels of sedentarism, physical inactivity, and obesity are rising. Physical inactivity is a direct cause of obesity and other metabolic consequences, according to a 2017 article (Pocnet et al.). In 2015 it was reported that the average U.S. woman weighed the same as a man in 1960s America, and the average 2015 U.S. man weighed as much as 1.5 American women of the 1960s. There is no denying that as a country, we are growing heavier and heavier as generations pass (Ingraham).

However, obesity is not the only issue caused by sedentary behavior. Heart disease, diabetes, and certain cancers like colon and esophageal are all health problems that sedentary



individuals find themselves more at risk of developing. While obesity can relate to these diseases, they are not exclusive to obese individuals. This paper addresses obesity simply because it is one of the most common ways that medical professionals gauge patient risk for other health concerns. Yet, as stated before, obesity is not the only part of the equation when evaluating a person’s health—when looking at interventions for people deemed to have cardiovascular risk factors, one of the two most important factors is physical inactivity, as it has “more effect on [cardiovascular risk factors] and, therefore, should be the focus of clinical interventions” (Pocnet et al.). Therefore, physical activity is one of the first and most important lifestyle behaviors to consider in someone’s health background.



*This image displays the variety of negative health consequences associated with sedentarism (Gibson 3).*

As the image above illustrates, there are all kinds of health problems that a physically inactive lifestyle can bring about. What is so fascinating about this topic is that it all stems from a sedentary lifestyle. While things like obesity, heart disease, cancers, and some of the other health problems listed above can be affected by genetics, most are brought about by the lifestyle choices people make. Sedentary behavior is not a new concept in society, but it is easier to partake in now than it was just a few generations ago. Cars and other forms of transportation are fairly new in the history of mankind, and such innovations have made it much easier for people to go from place to place. Other technologies have also made it much easier for people to work, shop, and entertain themselves without even leaving their homes. Even in this century alone, people have become more inactive due to technology; a cross-sectional study by Yang et al. states that “the estimated prevalence of computer use outside school or work for at least 1 h/d increased from 2001 to 2016... (from 29% to 50% for adults)” (Yang et al.). The internet is a tool that is meant to be used while sitting, and with its rise and the rise of new technologies, people are finding more and more ways to occupy their time without physical activity (Matusitz 258). The resulting lack of activity creates a dangerous pattern of life that leads to the dangerous health consequences in the chart above. This paper will investigate the behavioral patterns of

students at Thiel College in Greenville, Pennsylvania to evaluate their lifestyle choices and compare them to the general American population.

### **Definitions and Guidelines**

For the purpose of this project, physical activity is defined as any form of movement of muscles that burns caloric energy. Physical activity is important to living a healthy lifestyle as it burns calories, keeps the body moving, and keeps muscles toned and active (Gibson, et al., 3-4). Physical activity can consist of anything from walking across a college campus to taking the stairs on the way to a sixth-floor job. Exercise, which is physical activity structured to enhance physical health, can provide even more health benefits than basic physical activity. It is well known that exercise and high levels of physical activity in general make for a variety of health benefits. Effects of aerobic exercise (which are activities that improve endurance) and resistance exercise include an increased resting energy expenditure, which is the number of calories that the body burns at rest. This means that in terms of fitness, a physically active person burns more calories at rest than a person who is not (Gibson et al. 301). Maintaining a healthy body weight, strengthening the cardiovascular system, and keeping the body healthy and capable of performing daily tasks are some of the most familiar benefits. However, there are other benefits from regular exercise that exceed being “in shape.” Various sources show that exercise can work as an antidepressant, and that regular exercise helps improve mood and cognitive functioning (Martinsen).

While activity and exercise are beneficial, participation in small amounts that are few and far between provides little to no health benefits. There are a variety of organizations throughout the world that have created their own guidelines for proper amounts of physical activity and exercise. The Center for Disease Control and Prevention (CDC) in the United States has proposed that, in order to maintain a healthy lifestyle, adults need to partake in moderate-intensity aerobic activity for 150 minutes per week, along with two days of muscle-strengthening activity (*How much*). The American College of Sports Medicine (ACSM) echoes the CDC’s suggestions (*Physical*). What exactly defines moderate-intensity exercise? Cleveland Clinic exercise physiologist Christopher Travers states on the hospital’s website that health professionals “consider [moderate-intensity exercise as] anything that gets your heart rate up to 50 to 60% higher than your resting rate,” while the webpage also lists activities like “walking 2 miles in 30 minutes... running one and a half miles in 15 minutes... playing basketball for 20 minutes... [and] raking leaves for 30 minutes” (*What*). Organizations such as these have determined minimums to encourage people to maintain an active lifestyle and inform the public how much exercise leads to health benefits. Even though these guidelines exist, they are just minimums; higher levels of exercise lead to more health benefits, to a certain degree, and exercising “beyond [the] guidelines... reduces [cardiovascular disease] risk even more” (Kraus et al.).

Inversely, physical inactivity is not simply the opposite of physical activity. If a person does not reach the specified guidelines for physical activity, that does not make them physically inactive per say. One analysis titled “Global Physical Activity Levels: Surveillance Progress, Pitfalls, and Prospects,” stated that physical inactivity is defined as not reaching any of the three parameters, which were “30 minutes of moderate-intensity physical activity on at least 5 days each week... 20 minutes of vigorous-intensity physical activity on at least 3 days each week... [and] an equivalent combination achieving 600 MET-minutes each week” (Hallal et al. 6). Simplified, this means that a person is considered physically inactive when they do not meet 150 min/week of moderate PA, 60 min/week of vigorous PA, or a combination of the two that

achieves 600 MET-min/week (one MET is the energy spent sitting down, four METs is moderate activity, eight METs is vigorous activity). If an individual does not reach the 150-minute requirement for moderate-level exercise but does reach the 60-minute requirement for vigorous – level exercise, it does not mean they are physically inactive even though they do not achieve the 150-minute requirement.

### **How Many People are Living Physically Active Lifestyles?**

Despite the suggestions from the CDC, ACSM, and other groups, it appears that only a small portion of the U.S. population achieves these activity levels. In 2014, a survey was conducted by the United States government to gauge how many of its citizens met the 2008 guidelines of suggested physical activity levels. This survey found that “only a small percentage (21.5%) of adults over the age of 18 met the 2008 federal physical activity guidelines for adults in terms of both aerobic and muscle strengthening activities” (Gibson et al. 1). While that study looked at the population roughly 13 years ago, activity levels have not improved since then. A 2020 article titled “Prevalence of Behavioral Risk Factor in the United States of America Adult Population: A Concise Review of the Findings from the Behavioral Risk Factor Surveillance System” reports that in 2017, only 20.3% of American adults participated in adequate “aerobic and muscle strengthening exercises to meet guidelines” (Okechukwu 205). It is incredibly alarming that 4/5 of the American population is not active enough, and the numbers appear to be trending in the wrong direction.

This issue does not just apply to the United States, however, as in 2015 it was reported that “[w]orldwide, 31.1% (95% CI 30.9%-31.2%) of adults are physically inactive.” This inactivity is not evenly spread, “with proportions ranging from 17.0% (16.8%-17.2%) in southeast Asia to about 43% in the Americas and the eastern Mediterranean” (Hallal et al. 2). This study explains the danger in these figures, as “the human body has evolved... in such a manner that most of its systems... do not develop and function in an optimal manner unless activated by frequent physical activity” (Hallal et al., 4). With such high levels of physical inactivity, health problems are bound to rise. Gibson and colleagues also point out that 2016 World Health Organization (WHO) surveys reported 23% of the world’s population over 15 years of age was physically inactive (1). When approximately a quarter of the world’s population is classified as physically inactive, a large number of people face the health consequences of a sedentary lifestyle mentioned earlier in this paper.

### **Physical Activity Levels Among Thiel College Students: Survey Details**

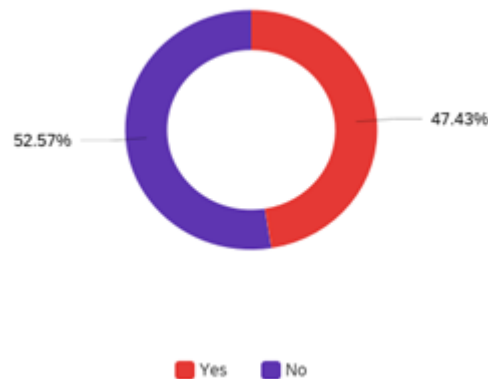
The focus of this paper is to evaluate the levels of physical activity among students at Thiel College in Greenville, Pennsylvania and determine if the majority of students at Thiel College are getting enough physical activity based on the previously stated CDC criteria. Looking at survey values and considering a variety of factors about the school, this project’s goal is to discuss what factors support or inhibit students from achieving recommended levels of PA. This question is important on a national scale, as values such as exercise levels in college students can forecast the future of physical activity levels. In one meta-analysis conducted pertaining to college students’ PA levels, it was stated that “84.7% of those who exercised regularly as college seniors were still physically active 5 or 10 years later... [and] 81.3% of those who were physically inactive as college seniors maintained a sedentary lifestyle” (Keating et al., 119). College is a period that many people create habits that they will carry with them for the rest of their lives, so it is important that college students are working to achieve healthy levels of activity.

Thiel College is considered a small school for U.S. standards and has a student population of 845 undergraduate, graduate, and part-time students. Thiel has a high level of student athletes and a variety of sports at the NCAA Division III level, with 425 student athletes enrolled (Pickens). This paper is hypothesizing that, due to the high level (50.3%) of student athletes at the college, most students achieve enough physical activity to be considered as having a healthy lifestyle. To determine physical activity levels, a survey was sent out to the entire student body via a college-provided email. The survey was left open for 10 days to give students plenty of time to fill out the survey if they wished. This survey was 13 questions long, and the questions can be found in Appendix A. Some questions that were most important on the survey were, “How often do you exercise per week,” and “Do you feel that you get enough moderate-intensity exercise throughout the week to be considered a healthy amount?” (Appendix A). At the beginning of the survey, it was clearly stated that the CDC requires 150 min/week of moderate exercise in order to be considered physically active, ensuring that the definition of “physically active” was not left open to the interpretation of the reader (Appendix A).

### **Physical Activity Levels Among Thiel College Students: Results & Discussion**

The survey conducted received an average of 162 responses, with one question peaking at 178 replies (which makes up 21% of the entire student population). Broken down by class, the majority of responses were first-year students (36% of total responses), with seniors coming in second (23.43% of total responses). There was fair representation amongst all undergraduate classes, and there were 6 graduate student participants (Appendix B, Q1, Figure 2). These values are important to acknowledge, as it makes clear that the values of the survey are not reflective of only one age group at the college. This means that the values for physical activity and exercise can be related across classes of students.

#### **Q2 - Are you a student athlete on a team at Thiel College?**



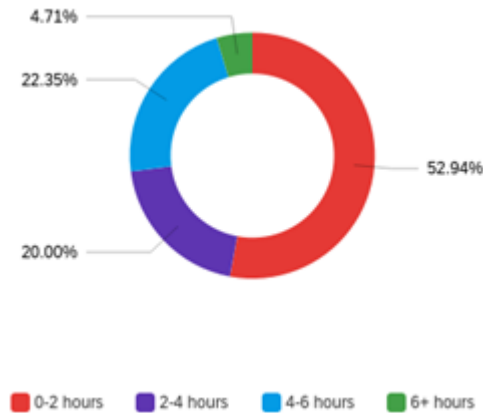
*App. B, Q2, Figure 3 illustrates student athlete and non-athlete participation*

In a proportion slightly lower than the 50.3% of student athletes on campus, participation in the survey was 47.43% athletes, meaning most participants in the survey do not play a sport at Thiel College (App. B, Q2, Figure 2). Despite the fact that less than half of the respondents to the survey were student athletes, almost 64% of those surveyed felt they were getting enough moderate-intensity exercise to be considered a healthy amount (App. B, Q3, Figure 2). While this is important, it does not mean that 64% of the students were participating in adequate amounts of exercise; this question only asks if they think they receive a healthy amount.

Moving on, Question 4 of the survey asked students how much physical activity they achieved in a week. Physical activity was clearly defined as “any movement resulting in an elevated heart rate” in order to distinguish it from exercise (Appendix A). The highest proportion

(34.94%) of respondents said they reached 6+ hours of physical activity a week, while the lowest proportion (14.46%) said they reached only 0-2 hours of physical activity. Another 49 of the 166 responses to this question (29.52%) said they got 2-4 hours of activity, while 21.08% of responses said they got 4-6 hours (Appendix B, Q4, Figure 3). This question is not pertaining to CDC values, as it asked about any forms of physical activity; however, it was important to ask in order to measure how active as a community Thiel College students are. Over half (56.02%) of students get more than four hours of physical activity in a week, which on a campus like Thiel's, with such short walks, means that most students are walking often (App. B, Q4, Figure 3).

**Q5- IF YOU ARE NOT A STUDENT ATHLETE, how often do you exercise per week?**



*App. B, Q5, Figure 3 displays non-athlete exercise levels*

The next three questions (5,6, and 7) were different iterations of the same basic question; “How often do you exercise per week?” Question 5 asked the non-athlete participants how much exercise they got per week. The majority (52.94%) of respondents who are not student athletes said they got 0-2 hours of physical activity per week. This highlights a major issue within the Thiel College student body. While it is not completely unexpected that non-athletes would be less physically active than athletes, it is alarming that almost 53% of those students get 30 minutes less than the CDC’s recommended 150 minutes of exercise per week (Appendix B, Q5, Figure 2). The 45 non-athlete respondents who get 0-2 hours of physical activity make up 25.7% of the total respondents for the survey, which coincides with the aforementioned 23% of physically inactive adults 15 years and older from the 2016 WHO survey (Gibson et al., 1).

What factors could create such a value? Students who are not athletes on campus or are not involved in any other extracurriculars may not have the motivation, education, or desire to go out and get exercise. Whatever the case may be, these students may be putting their health at risk by not getting adequate amounts of exercise. The second highest proportion of non-athletes was 22.35% who said they achieved 4-6 hours of exercise, which is a promising value. Meanwhile, 20% of non-athlete respondents said they got 2-4 hours of exercise, meaning that they could be just on the cusp of the 150 min/week benchmark (App. B, Q5, Fig. 3). Despite those facts, the most glaring is the 53% of students who are far short what is considered a healthy amount of exercise.

Question 6 specifically asked student athletes how much exercise they got in-season, specifically. It is no surprise that 83.95% of student athlete participants responded that they reached more than six hours per week. Another 8.64% of the student athlete group said they achieved 4-6 hours of physical activity, with only 3.7% in both 2-4 and 0-2 hours. With a total of



92.95% of student athlete respondents getting more than 4 hours of exercise per week in-season, it is safe to say that Thiel College student athletes are getting a healthy amount of exercise (App. B, Q6, Fig. 2).

**How often do you exercise in-season? How often do you exercise out of season?**



*Appendix B, Q6, Figure 3 and Q7, Figure 3 highlight the differences of in-season versus off-season exercise patterns for student athletes.*

Like Question 6, Question 7 was directed at student athlete participants only. This question asked athlete participants how much physical activity they participate in during the off-season (a time period when their sport is not playing games). In this question, there is more variety amongst the amount of exercise athletes achieved. The majority of athletes (61.25%) still reached more than 4 hours per week, but there was a greater number of athletes who fell into the 2-4-hour range (31.25%). This is not necessarily a negative finding, as the majority of student athletes are still well above the CDC’s recommended values (App. B, Q7, Fig. 2). However, these findings may display the phenomenon that when athletes are not required to participate in exercise for their sports, they fall off in exercise participation. This could raise concern when considering how student athletes may behave once their collegiate careers are over post-graduation.

Question 8 was another student athlete-directed question, and it pertained to both in- and off-season workouts. According to the survey conducted, 90.24% of the respondents’ exercise both in-season and out-of-season is required by various teams at Thiel College (App. B, Q8, Fig. 2). The results from this question could provide insight as to why the non-athletes got such little exercise; are students at Thiel working out because they have to or because they want to? The percentage here suggests that student athletes probably exercise more than CDC guidelines because they are required to by their teams. This is not a problem per se, but it is something to consider when thinking about things like motivating factors for college students to exercise.

The next question was one that applied to all surveyed, and it asked students what extracurriculars they participated in. Responses showed that the most popular extracurricular category was clubs (44.38%), followed by the Thiel Players, which is Thiel College’s theater organization. An additional 10.67% of responses were for Thiel’s various bands on campus, and 9.55% were for intramural sports like flag football (App. B, Q9, Fig. 2). There were 40 responses in the “Other” category, which allowed text entry. Of those 40 responses, 15 were applicable to the category of other, while the rest were involving a sport or simply said “nothing.” Of these 15 responses in other, common answers were Greek life and choir (App. B, Q9, Fig. 3). It is clear that outside of organized sports, many of those who were surveyed participate in other areas on campus, with 85.9% of responses to this question qualifying as something other than a sport on campus.

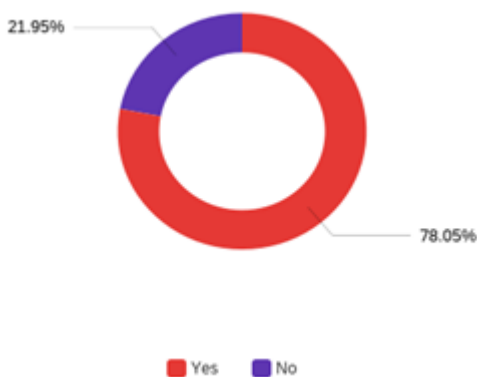
**Do you use the exercise facilities on Thiel College’s campus?**

#	Answer	%	Count
1	Yes	71.52%	118
2	No	28.48%	47
	Total	100%	165

*App. B, Q10, Figure 2*

Question 10 is stated in the graph above and asked if students use any of the athletic or exercise facilities on campus. Some examples of facilities listed were the college’s track, football field, gymnasium, weight room, and basketball courts (Appendix A, #10). Not surprisingly, 71.25% of respondents said they do use these facilities (App. B, Q10, Fig. 2). This makes perfect sense when considering that there were 45 students who are not athletes who said they achieved less than 2 hours of physical activity, which equates to 25.7% of the total respondents. Combining this with the few student athletes who also said they got less than 2 hours of physical activity, it is reasonable to believe that roughly 28% of those surveyed do not use the exercise facilities on campus. This number is promising, but it should also highlight a challenge for the college to promote and advertise its facilities for more general use.

**Do you feel that Thiel College provides exercise facilities that adequately fit your needs?**



*Appendix B, Q11, Figure 3*

The following question is another one that pertains to the college’s facilities, asking if students feel that Thiel College provides facilities that fit their needs. Question 11’s results show that 78.05% of the students at Thiel feel the athletic complexes and exercise facilities adequately fit their needs (App. B, Q11, Fig. 2). This is a statistic with positive connotations, as it shows that students feel their needs are met. Despite this value, Question 12 highlights some of the changes students would like to see in the facilities on Thiel’s campus.

Question 12 was the only complete fill-in-the-blank question on the survey, and it asked those surveyed what improvements they would like to see in the facilities at Thiel College (App. A, #12). Of those surveyed, 109 students responded, with 88 of those responses being suggested improvements to facilities (80.73%). 21 of those 109 responses (19.27%) were either blank or had some form of a response equating to “no improvements” or “none.” Of the 88 suggestions for improvements, 36 of those had some mention of more or better equipment in the weight room, meaning things such as machines, weight racks, free weights, and other lifting equipment



(40.9%). 33 of the 88 responses (37.5%) were regarding improvements to the weight room itself, stating a need for newer lifting facilities, more space, and updated lifting spaces (App. B, Q12, Fig. 1). Additions of private workout rooms, yoga classes, and exercise classes were also included in this result. Suggestions for a different schedule/24-hour gym and a new air conditioning system got six replies apiece, for a percentage total 6.82% each (App. B, Q12, Fig. 1). One of the more unique answers to this question involved the addition of a pool, which would make exercise easier for students with weight bearing limitations and other physical issues that may prohibit them from getting adequate exercise (Gibson et al., 141). Another surprising answer that was seen throughout the suggestions (5.68%) was a time or space in the weight room established only for females (App. B, Q12, Fig. 1). While this is a topic not entirely related to this paper, it is important to acknowledge the fact that some may not work out in fear of being judged, harassed, or objectified, and this issue is another challenge the school should work to overcome. In general, the resounding suggestions were for updating the weightlifting equipment in the gym and improving the weight room itself.

Finally, Question 13 asked respondents if they were aware of the CDC's 150min/week recommendation prior to this survey (App. A, #13). 55.15% of students surveyed said they were not aware of the guidelines, pointing out the fact that most students do not know how much moderate-intensity exercise they need in order to be considered a healthy amount (App. B, Q13, Fig. 2). This fact may relate to why the majority of students who are not athletes do not exercise under their own volition, and to why many Americans also do not get adequate amounts of physical activity.

### **Discussion & Applications**

From this survey, my thesis question was given a variety of answers. In the most basic sense, this survey supported the hypothesis that the majority of students at Thiel College get enough physical activity to be considered a healthy amount by CDC standards. With half the campus partaking in school-sanctioned athletics, it is no surprise that when one combines the value of non-student athletes and the value of student athletes in-season, the majority of those surveyed (55.7%) meets CDC recommendations (Appendix B, Q5, Fig. 2, & Q6, Fig. 2). These results are comparable to values from 2005, in which "researchers reported that about 40% to 50% of college students are physically inactive" (Keating et al., 116). However, when the focus is shifted to specific student demographics, the answer is not quite the same. When looking at just the group of non-athlete students, it is clear that the majority of these students do not meet the CDC's 150 min/week recommendation for a healthy lifestyle. Roughly 53% of this group fell into the 0-2-hour range, meaning that they are still 30 minutes off from reaching the CDC guidelines. That percentage does not even equate for however many respondents from the 2-4-hour range (20% of total non-athletes) also get less than 2.5 hours (App. B, Q5, Fig. 3).

What is the importance of these values? College is a time of individuality and self-discovery, which explains why "many adult health behaviors are established during the college years" (Pauline 65). Therefore, a student's time in college is one that holds important weight as to how active of that person will be across his or her life. Studies have shown that values of physical activity while still in college are highly indicative of physical activity levels in the same population many years into adulthood (Keating et al., 119). Students often have more freedoms when making decisions than they had at any point in their lives previously and may not have learned enough about exercise to start working out in college. Due to the major importance that physical activity patterns in college have on the rest of an individual's adult life, it is imperative

that colleges provide plenty of resources for students to discover and partake in physical activity and exercise.

To increase levels of activity levels in a college's student population is a difficult task. Research has shown that a mixture of extrinsic and intrinsic factors are "important when considering physical activity" in college students (Elgi et al. 404). Some common motivating factors include appearance, the need for a challenge, competitive nature, and ill-health avoidance, to name a few (Elgi et al. 404). Students are driven by these ideas and others to continuously work out and exercise. How can a college use these factors to inspire more students to get the recommended amount of exercise? While that answer may be quite complicated, there is another solution that Thiel College should consider; instead of trying to convince students to exercise, invest in facilities that will make its students want to exercise.

### **Proposed Improvements to Thiel College**

When a student is in college, it makes sense that their surroundings would influence their physical activity levels; therefore, it is the responsibility of a college to provide its students with resources that promote physical activity, especially "due to the current levels of inactivity" (Pauline 72). Keating and colleagues state that the two strategies public health officials—or in this case colleges—can use are "changing the surrounding physical environments to integrate PA into daily routine..." and "providing complimentary sophisticated services as an amenity of the surrounding physical environments" (116). While the results of survey question 11 suggest that students at Thiel College find the campus facilities acceptable, that does not mean that the college has optimal resources for promoting physical activity (App. B, Q11, Fig. 1). It is clear in the number of suggestions in Appendix B, Q12, Figure 1 that many students feel they would benefit from a variety of improvements to Thiel's exercise areas.

There are a variety of short-term options that Thiel College should consider that would boost the amount of exercise its students get, specifically students who are not part of an athletic team on campus. An article titled "Physical Activity, Exercise, and Sedentary Behavior in College Students" highlights that getting students to participate in some form of an elective conditioning course leads to higher levels of student exercise compared to national values (Buckworth 30). It makes sense that giving students the option to take courses that involve exercise would increase exercise levels in the student body. While Thiel College has such courses, there are not many options for students to choose from. The college offers golf and bowling courses, and while they are sports that encourage competition and challenges for the students, they do not qualify as the moderate-level activity that CDC recommendations and this project are focused on. Thiel College also offers two courses titled "Physical Fitness" and "Weight Training" ("Concise"). These classes could help to fulfill students' need for exercise, but "Physical Fitness" is only offered for an hour on Mondays and Wednesdays each, and "Weight Training" is on Tuesdays and Thursdays for the same amount of time. It has been shown that college students exercise more on weekdays than weekends, so Thiel College should capitalize on a more active student body during the week (Behrens 170). A simple and short-term solution to increase student activity levels would be to provide more courses involving moderate exercise activities.

In addition to adding courses, adding a program to bring in exercise science students or professionals to assist students who are looking to begin exercising could provide additional support. If students who have never worked out before are left to their own devices, they may not get very far in creating an exercise program. Having a trainer or current exercise science student's contact information readily available to students could allow students from all

experience levels to further their health and exercise regimens. While this is another short-term solution, it would simply require some quick collaboration with Thiel College and the school's Exercise Science, Biology, and/or Health Services departments.

A third short-term solution for the college to consider is found in the survey conducted for this project. Question 12 asked students to suggest improvements to Thiel College's facilities, and some students provided answers that could be implemented tomorrow. Almost 7% of the 88 suggestions were pertaining to a change in the hours of the gymnasium (App. B, Q12, Fig. 1). Some students prefer to work out at any time of the day, so making the weight room a 24-hour facility or changing the hours to keep it open until midnight or later, would allow for students to exercise at a time when they have more availability. Keeping the gymnasium open (when teams are not practicing) for basketball or other activities would also allow for students to exercise in their free times.

As far as long-term solutions, the survey provides a few as well. It is important for the school to consider these changes, as environmental changes in order to increase exercise is a viable strategy when considering how people can be prompted to exercise more (Keating et al., 116). Seeing as Thiel College is located on a smaller campus than most colleges—135 acres, according to *U.S. News*—it would be difficult for the school to alter the landscape in order to provide more walking paths and space to hike, walk, or run (*Thiel College*). Changes such as a new weight room facility (37.5% of suggested improvements) and newer, updated lifting modalities and equipment (40.9%) are some of the major environmental alterations that were brought up in the survey. Clearly, students who already work out feel they would benefit from advancements in the exercise facilities on campus, and providing new, updated tools for training and exercising may prompt inactive students to change their activity patterns.

Along with these improvements, a pool would also be a major upgrade that some of the surveyed population feel would be beneficial (App. B, Q12, Fig. 1). The implementation of a pool could be advantageous, as when “compared to land-based exercise, aquatic exercise achieved equivalent improvements” to health (Barker et al., 283-284). That fact means that when there is a pool available, “patients can choose the exercise mode that appeals most to them” without having to sacrifice the benefits of exercise (Barker et al. 284-285). Students with weightbearing limitations, issues with aerobic exercise like running, or those with other injuries and conditions may prefer a pool much more to other forms of moderate-intensity exercise. Thiel College should consider this variety of additions to the campus environment as long-term steps to promote exercise on campus amongst its student population.

### **Concluding Thoughts**

In review, Thiel College can be divided into two main demographics of students: athletes and non-athletes. When considering whether or not Thiel College students achieve the Center for Disease Control's recommended 150 minute per week goal for moderate-level exercise, it is important to divide the student body into these groups. It is not surprising that Thiel College's values of activity are slightly higher than averages for colleges with lower proportions of student athletes, which is why dividing the Thiel population helps to better analyze it. Most student athletes at Thiel College go well beyond the 150 min/week requirement, regardless of if they are being asked about the in-season or off-season. Comparatively, when it comes to students who are not athletes at Thiel, the majority are falling short of the CDC's guidelines. While many students use the facilities at Thiel College (App. B, Q10, Fig. 1) and the majority feel that the facilities accurately fulfill their needs when exercising (App. B, Q11, Fig. 3), there are improvements to facilities that should be considered.

A blending of short-term and long-term additions to campus life at Thiel College could lead to significant improvements in non-athlete exercise participation. Despite some expensive solutions and some work to improve existing facilities on campus, the benefits of an increase in physically active students holds importance. Lifestyles of sitting around for travel, work, and leisure create a variety of major health issues that can often be avoided by lifestyle changes. Oftentimes, people develop health problems like type II diabetes, heart disease, and metabolic disorders over time due to a life without adequate amounts of exercise. When one is considering these sedentary lifestyles, a transformative time like college can make or break certain behaviors; college is a time where people develop life habits, and colleges should honor its students by providing them the best lessons, tools, and information to create healthy lifestyles.

### Comments

In the survey conducted, it is important to note that while 176 responses were recorded, not every question was answered by these 176 respondents. The survey was sent out electronically and was a voluntary task, with no way of ensuring that respondents filled out every single question. Ideally, respondents would fill out every single question, except for the ones that were specifically asking for student-athletes or non-athletes.

Also important to note are the survey intervals for questions 4, 5, 6, and 7 (all questions pertaining to physical activity or exercise levels). In these questions, the survey respondents were given intervals from 0 hours all the way up to 6+ hours, with 2-hour increments in between. Therefore, when responses came back, students were in a range from 0-2 hours, 2-4 hours, 4-6 hours, or 6+ hours. This serves to be problematic when trying to find out the exact number of students who fall above or below the CDC's two-and-a-half hour (150-minute) weekly requirement for moderate intensity exercise, as there was no mark to tell who was under two and a half hours and who was over that amount in the 2-4-hour group. While the results of this study still showed that the majority of students who are not a part of athletics were either under or over the 150-minute mark, if this study were to be built upon or redone, one hour and fifteen minutes or two and a half hour increments would be used instead.

*Alex Lutz '22 graduated with a BS in Exercise Science and is from Loveland, OH.*

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### **Appendix A (Lutz, Survey Questions)**

Per the CDC, American adults require 150 minutes of moderate-intensity exercise per week (moderate intensity exercise entails any movement that raises your heart rate). The purpose of this survey is to see how much physical activity and exercise students at Thiel College are getting on a weekly basis.

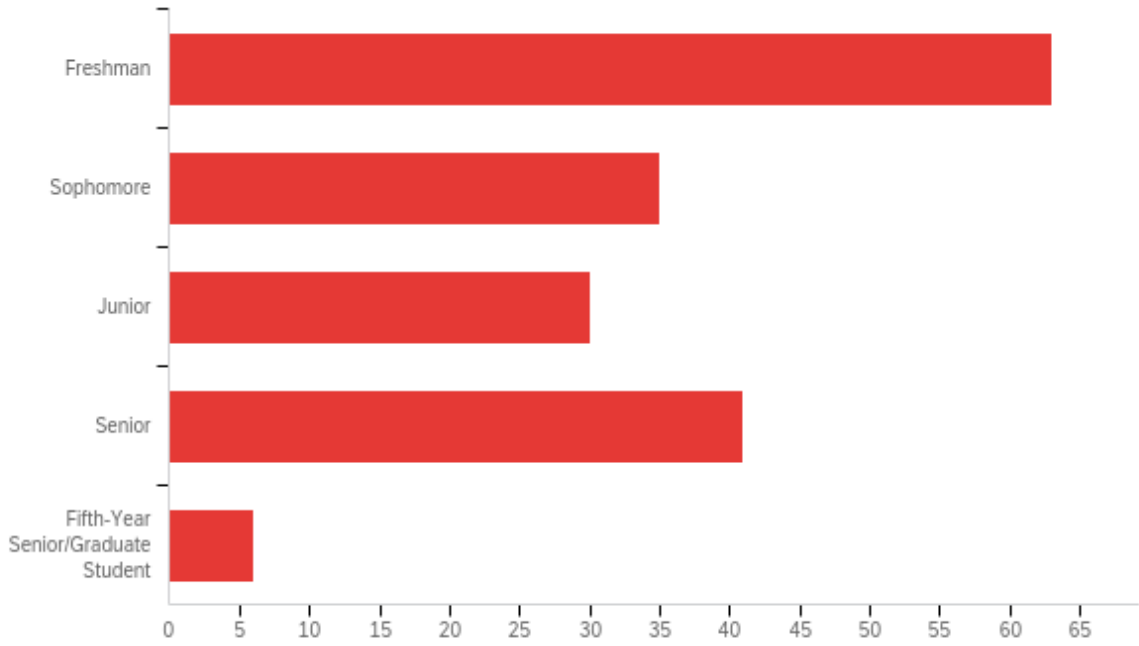
- For the sake of this survey, physical activity is defined as any movement resulting in muscular activation (i.e. walking to class). When asking about physical activity, exercise is not included.
- Comparatively, exercise is defined as any form of physical activity that is structured and intentional movement (i.e. running, weight lifting, participating in sports). This is different from physical activity in the fact that exercise involves the intent to move the body in a certain manner.

Please enter your email for a chance to be randomly selected for a gift card as a thank you for your participation! (incomplete surveys will not be selected)

1. What year student are you?
2. Are you a student athlete on a team at Thiel College?
3. Do you feel that you get enough moderate-intensity exercise throughout your week to be considered a healthy amount?
4. How often do you participate in physical activity per week? (Physical activity is defined as any movement resulting in an elevated heart rate)
5. IF YOU ARE NOT A STUDENT ATHLETE, how often do you exercise per week? (Exercise is defined as any form of physical activity that is structured and intentional movement)
6. IF YOU ARE AN ATHLETE, how often do you exercise per week IN SEASON? (Exercise is defined as any form of physical activity that is structured and intentional movement)
7. IF YOU ARE AN ATHLETE, how often do you exercise per week out of season? (Exercise is defined as any form of physical activity that is structured and intentional movement)
8. Which forms of exercise are required by your team?
9. What extracurriculars do you participate in? (Select all that apply)
10. Do you use the exercise facilities on Thiel College's campus? (Track, football field, gymnasium, weightroom, basketball courts)
11. Do you feel that Thiel College provides exercise facilities that adequately fit your needs?
12. What improvements, additions, or changes would you like to see to the exercise facilities on Thiel College's campus? (Fill in the blank)
13. Prior to the beginning of this survey, were you aware of the CDC's recommendations for moderate-level exercise?



**Appendix B (Lutz, Survey Report)**  
*Q1 - What year student are you?*



*Figure 1*

#	Answer	%	Count
1	Freshman	36.00%	63
2	Sophomore	20.00%	35
3	Junior	17.14%	30
4	Senior	23.43%	41
5	Fifth-Year Senior/Graduate Student	3.43%	6
	Total	100%	175

Figure 2

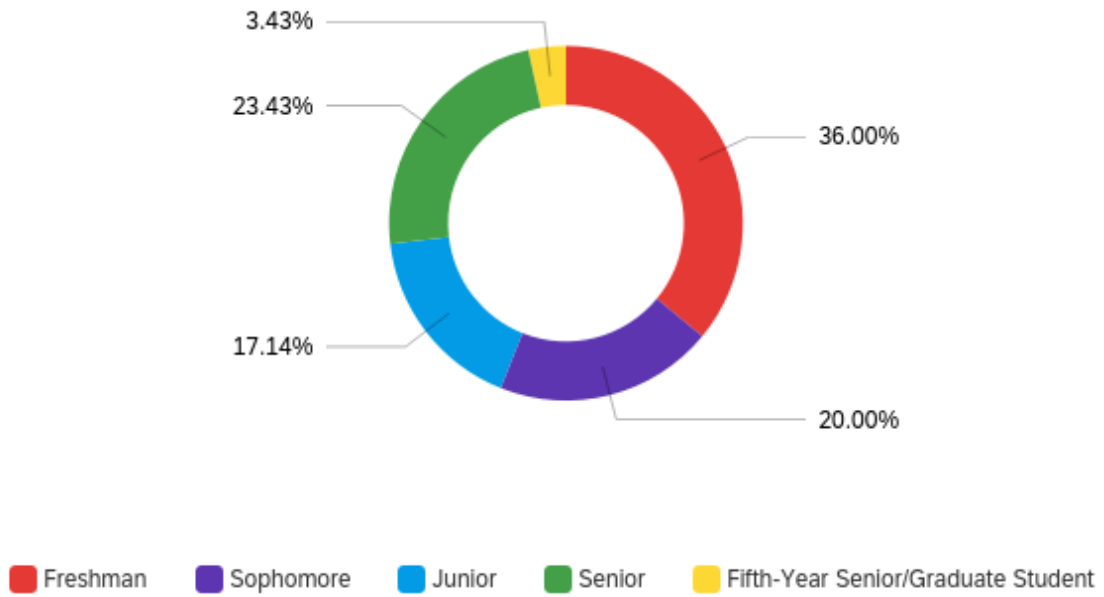


Figure 3

Q2 - Are you a student athlete on a team at Thiel College?

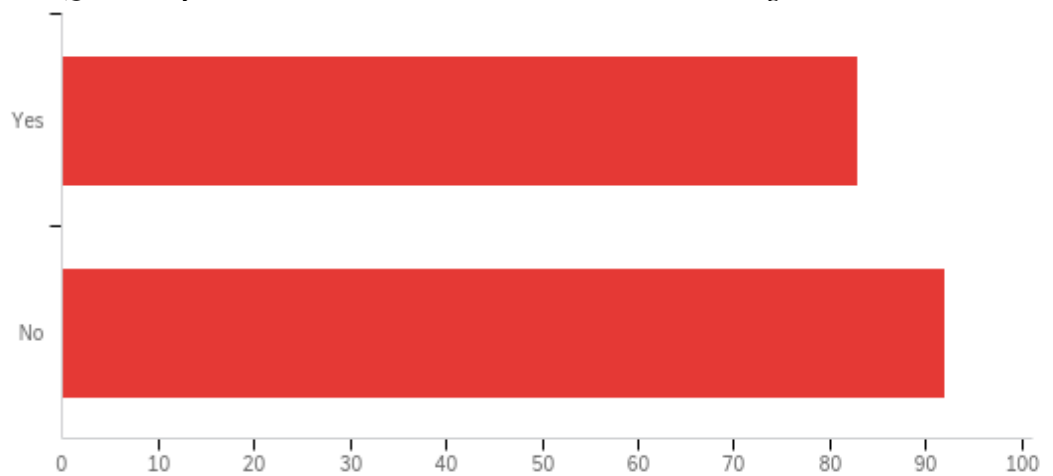


Figure 1

#	Answer	%	Count
1	Yes	47.43%	83
2	No	52.57%	92
	Total	100%	175

Figure 2

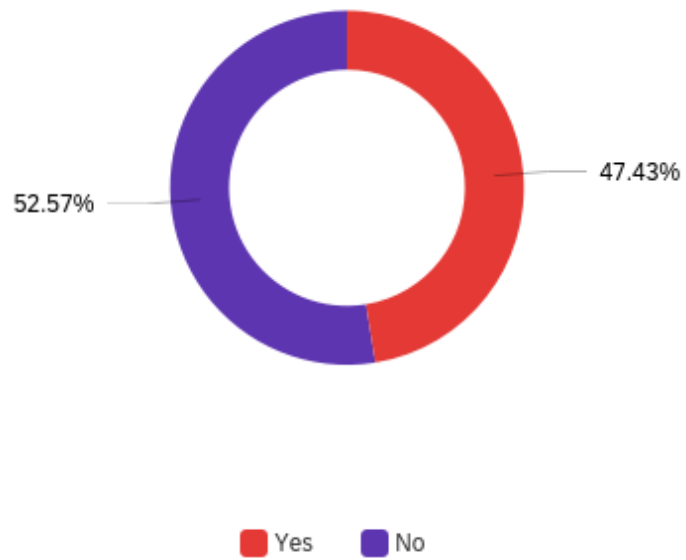


Figure 3

Q3 - Do you feel that you get enough moderate-intensity exercise throughout your week to be considered a healthy amount?

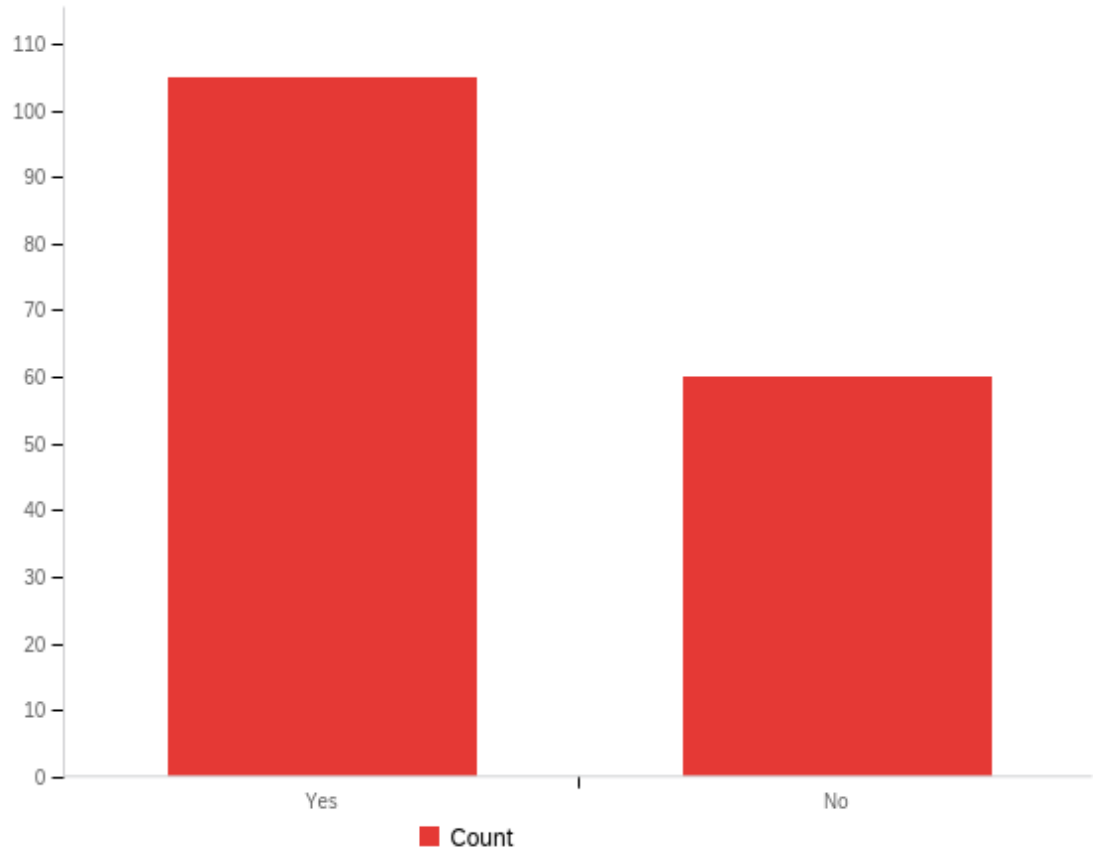


Figure 1

#	Answer	%	Count
1	Yes	63.64%	105
2	No	36.36%	60
	Total	100%	165

Figure 2

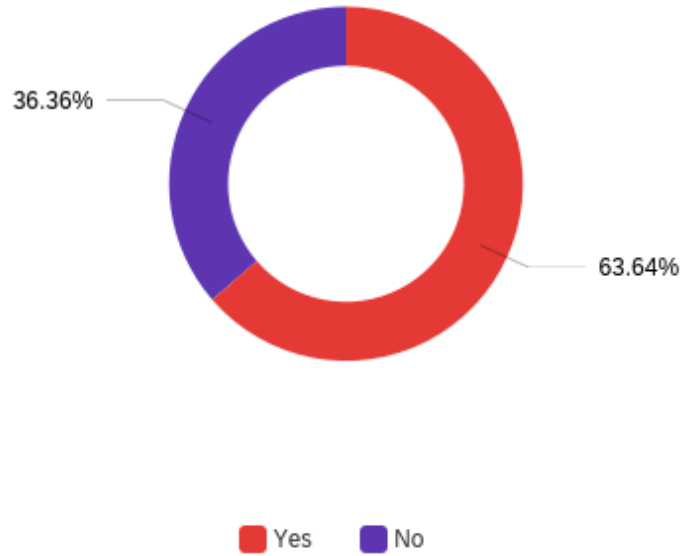


Figure 3

Q4 - How often do you participate in physical activity per week? (Physical activity is defined as any movement resulting in an elevated heart rate)

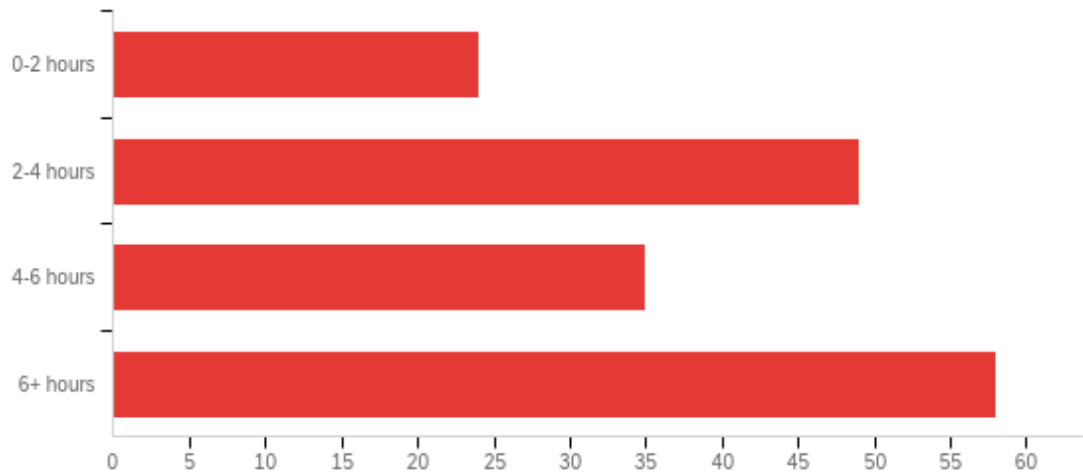
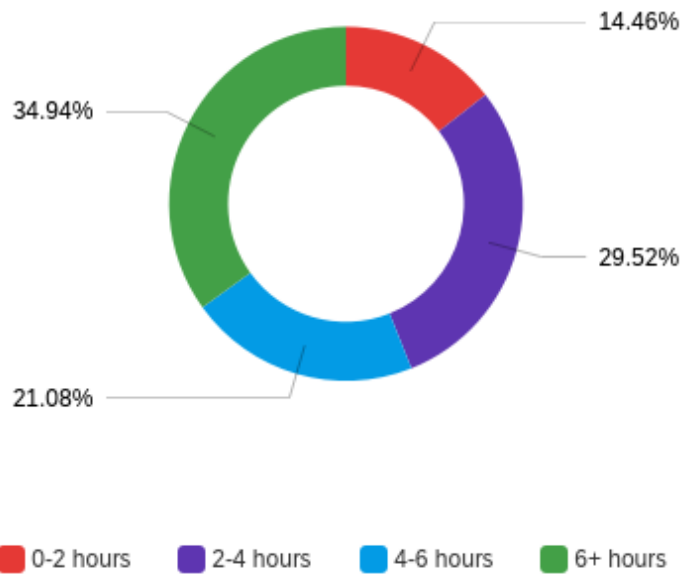


Figure 1

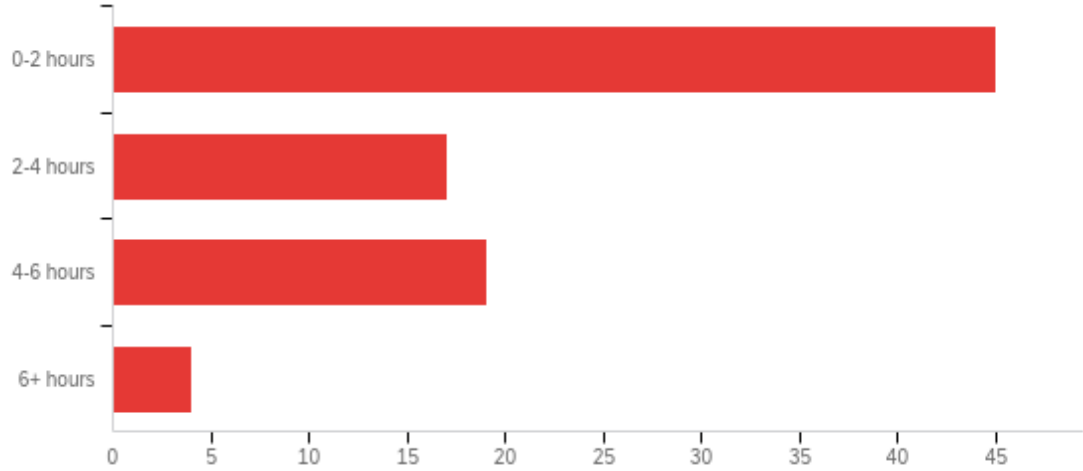
#	Answer	%	Count
1	0-2 hours	14.46%	24
2	2-4 hours	29.52%	49
3	4-6 hours	21.08%	35
4	6+ hours	34.94%	58
	Total	100%	166

Figure 2





*Figure 3*  
*Q5 - IF YOU ARE NOT A STUDENT ATHLETE, how often do you exercise per week?*  
*(Exercise is defined as any form of physical activity that is structured and intentional movement)*



*Figure 1*

#	Answer	%	Count
1	0-2 hours	52.94%	45
2	2-4 hours	20.00%	17
3	4-6 hours	22.35%	19
4	6+ hours	4.71%	4
	Total	100%	85

Figure 2

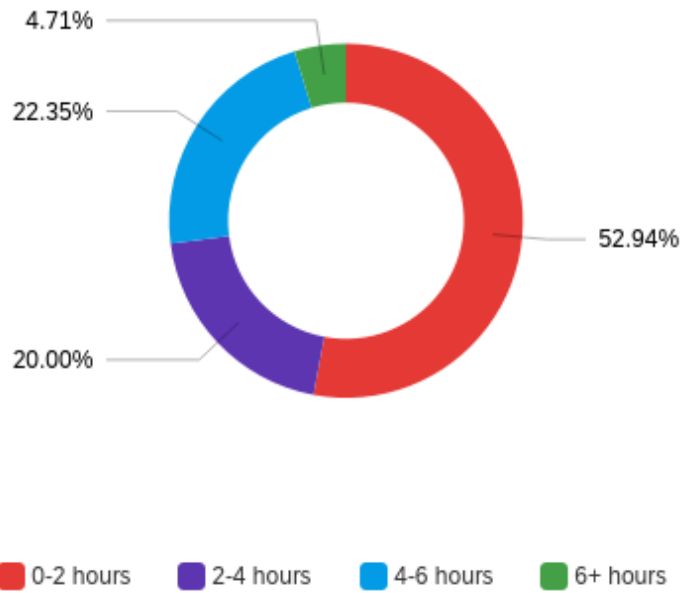


Figure 3

Q6 - IF YOU ARE AN ATHLETE, how often do you exercise per week IN SEASON?  
(Exercise is defined as any form of physical activity that is structured and intentional movement)

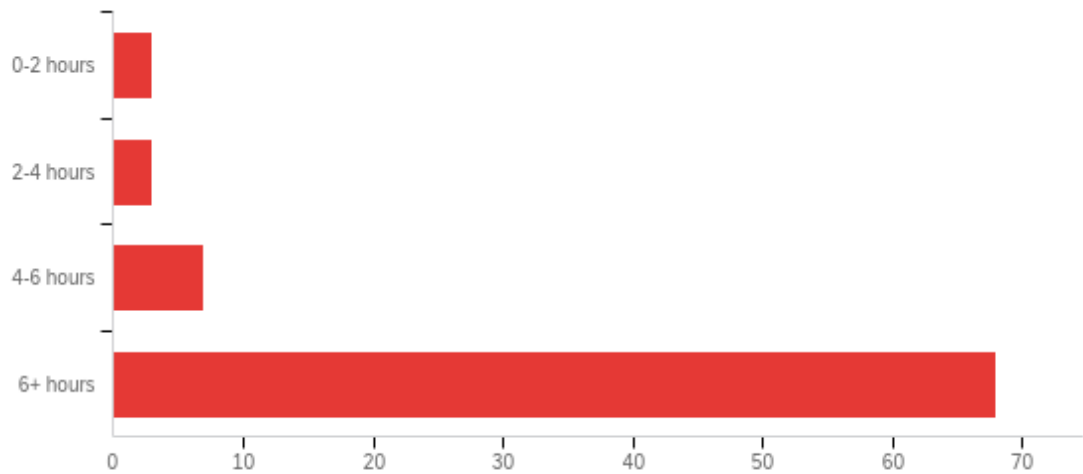
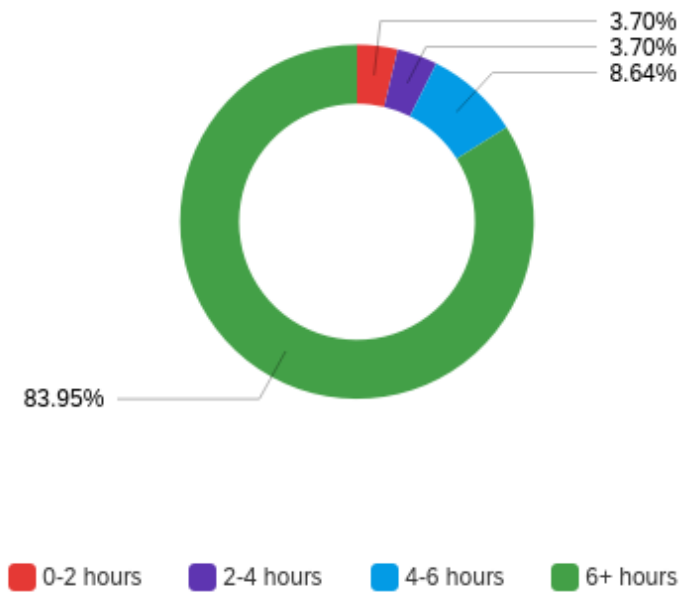


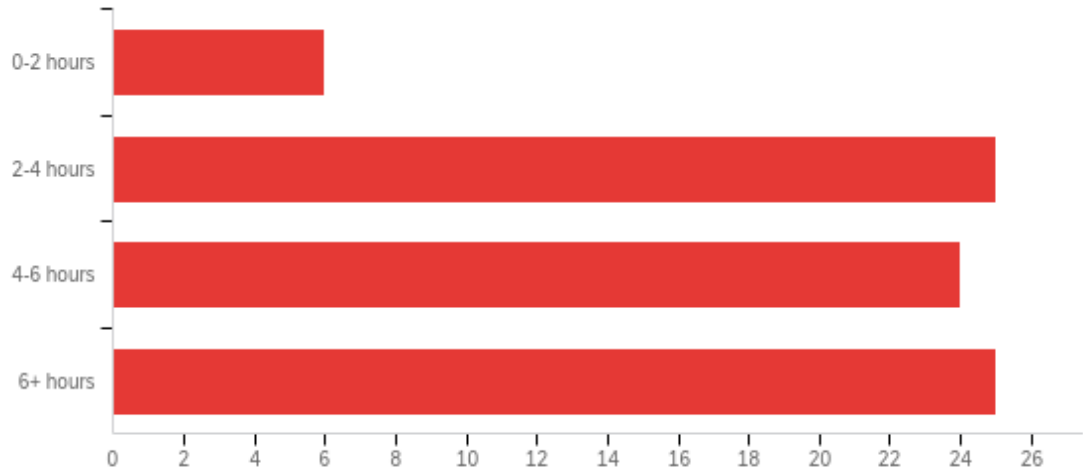
Figure 1

#	Answer	%	Count
1	0-2 hours	3.70%	3
2	2-4 hours	3.70%	3
3	4-6 hours	8.64%	7
4	6+ hours	83.95%	68
	Total	100%	81

Figure 2



*Figure 3*  
*Q7 - IF YOU ARE AN ATHLETE, how often do you exercise per week out of season?*  
*(Exercise is defined as any form of physical activity that is structured and intentional movement)*



*Figure 1*

#	Answer	%	Count
1	0-2 hours	7.50%	6
2	2-4 hours	31.25%	25
3	4-6 hours	30.00%	24
4	6+ hours	31.25%	25
	Total	100%	80

Figure 2

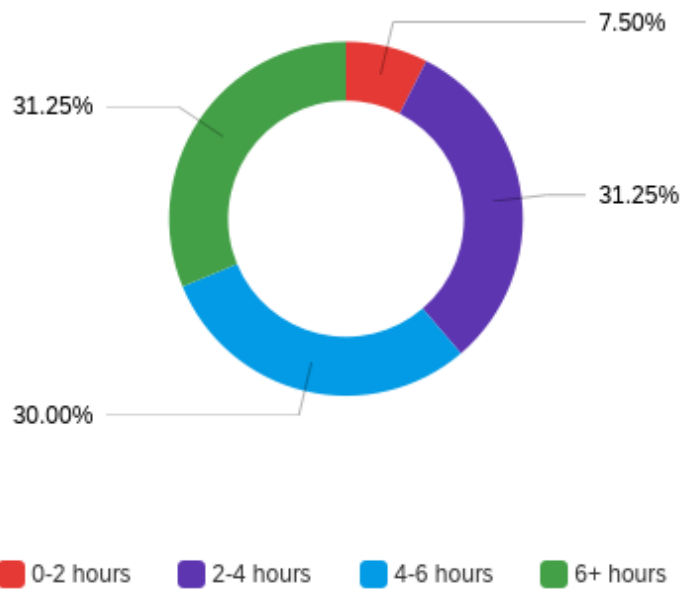


Figure 3

Q8 - Which forms of exercise are required by your team?

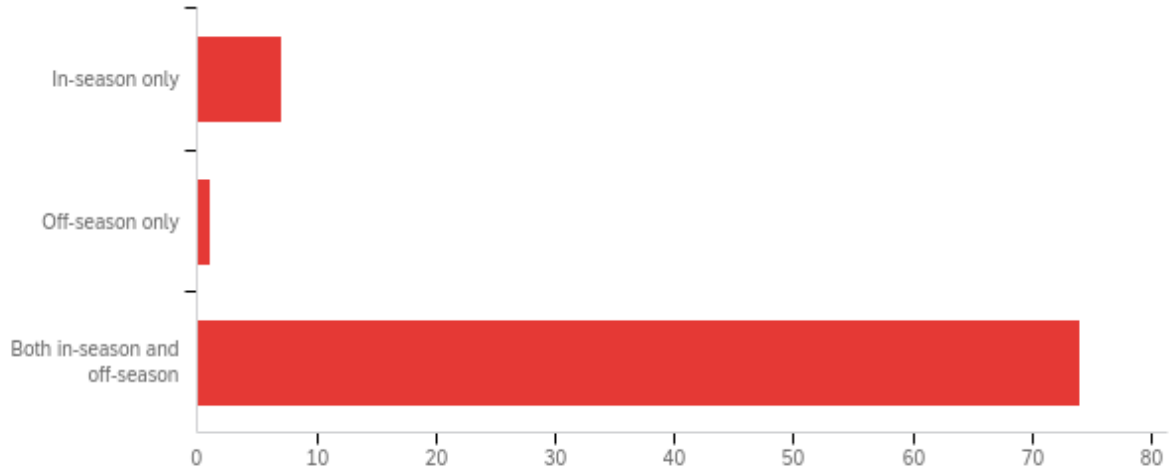
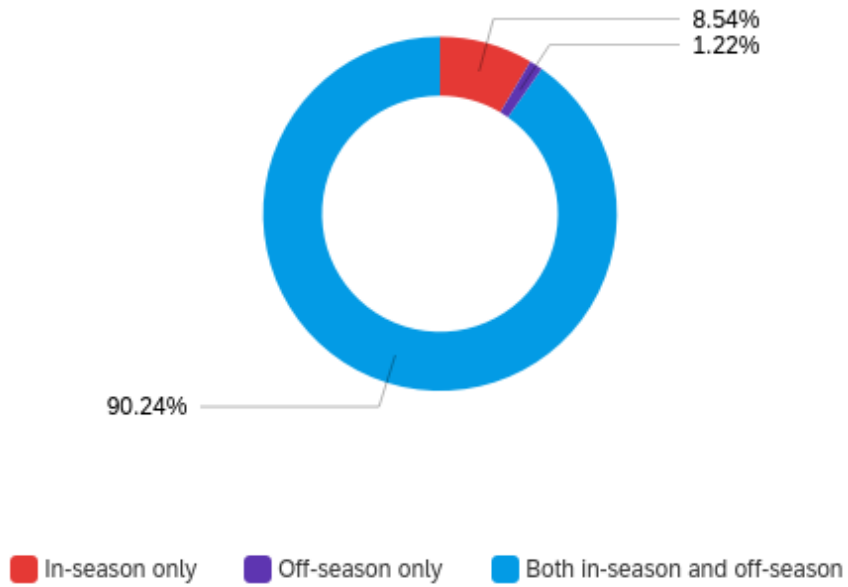


Figure 1

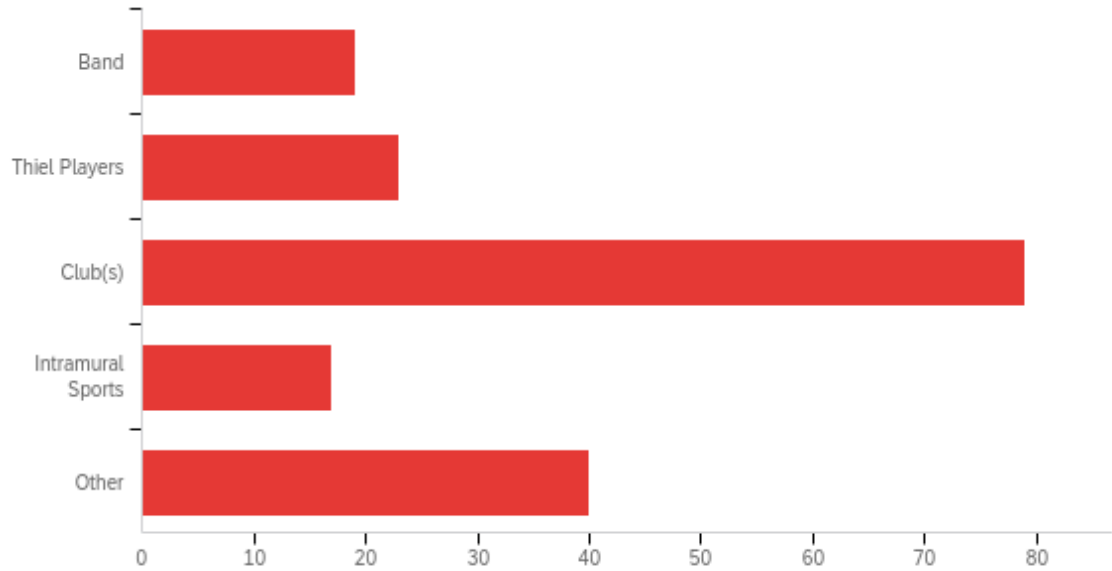
#	Answer	%	Count
2	In-season only	8.54%	7
3	Off-season only	1.22%	1
4	Both in-season and off-season	90.24%	74
	Total	100%	82

Figure 2





*Figure 3*  
*Q9 - What extracurriculars do you participate in? (Select all that apply)*



*Figure 1*

#	Answer	%	Count
1	Band	10.67%	19
2	Thiel Players	12.92%	23
3	Club(s)	44.38%	79
4	Intramural Sports	9.55%	17
5	Other	22.47%	40
	Total	100%	178



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None

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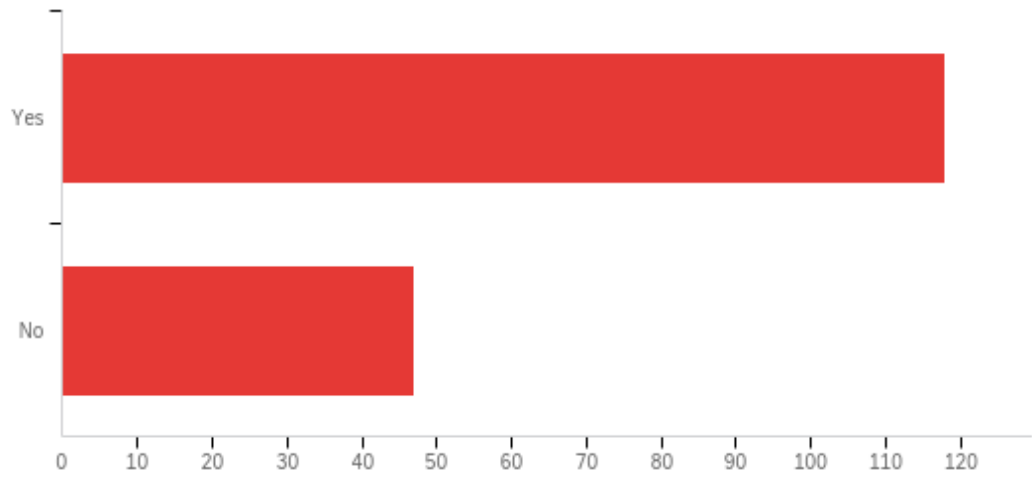
Greek life

---

None

---

*Figure 3*  
*Q10 - Do you use the exercise facilities on Thiel College's campus? (Track, football field, gymnasium, weightroom, basketball courts)*



*Figure 1*

#	Answer	%	Count
1	Yes	71.52%	118
2	No	28.48%	47
	Total	100%	165

Figure 2

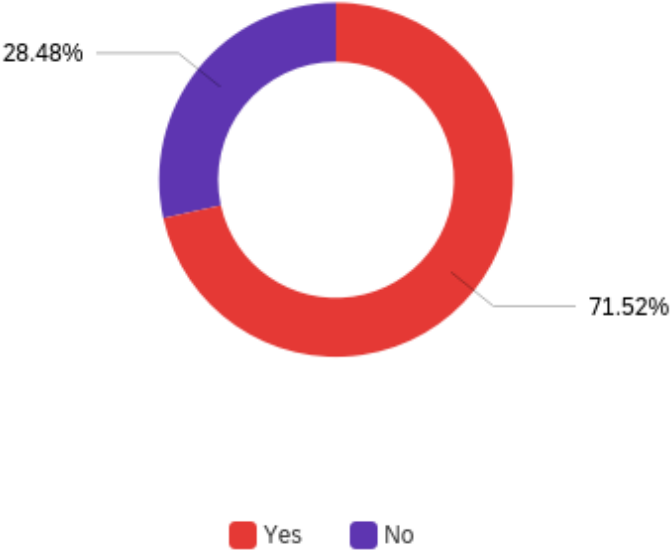


Figure 3

Q11 - Do you feel that Thiel College provides exercise facilities that adequately fit your needs?

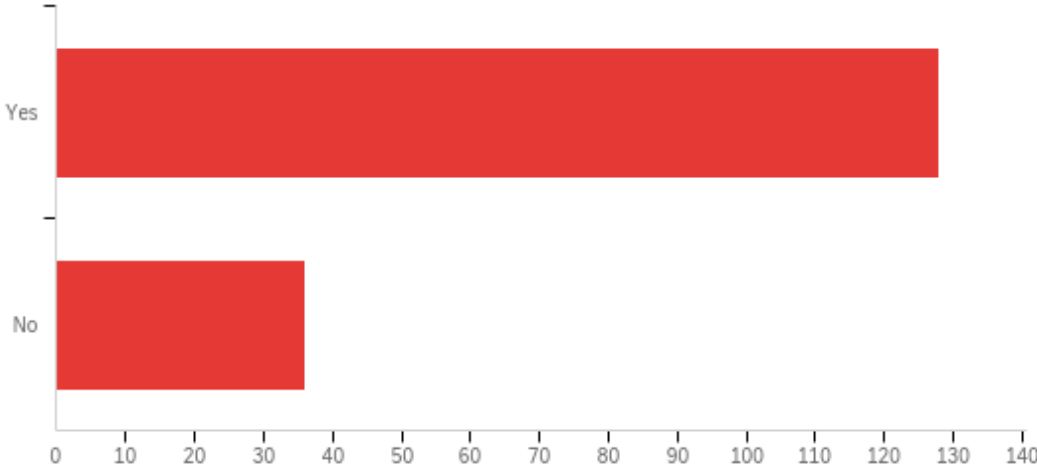


Figure 1

#	Answer	%	Count
1	Yes	78.05%	128
2	No	21.95%	36
	Total	100%	164

Figure 2

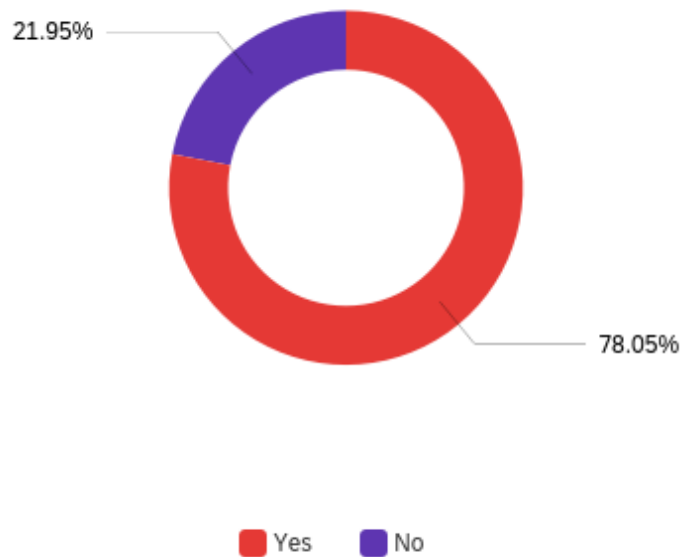


Figure 3

*Q12 - What improvements, additions, or changes would you like to see to the exercise facilities on Thiel College's campus? (Fill in the blank)*

What improvements, additions, or changes would you like to see to the exercise facilities on Thiel College's campus? (Fill in the blank)

- I would like to see a 24/7 gym
- Old machines need replaced in the weightroom
- It's too expensive to build and maintain at Thiel, but I would go to an ice rink almost every day.
- Maybe more weights in the weight room and more space.
- Better/Newer equipment
- air conditioning, air pumps for basketballs
- obstacle course

---

Better leg press

---

Different hours for the exercise facilities

---

Newer Weight room equipment

---

new machinery. more machinery.

---

Maybe a larger weight room

---

Dip machine for weight room

---

More weights like dumbbells

---

A bigger weight room and also the wrestling room is more like a hall way. They should build a center for wrestling and one for lifting.

---

Maybe allow an hour or two for women only to use the gym, a lot of women aren't comfortable working out in front of men

---

Stair climber

---

I feel as though they should have more flexible hours, considering some students may workout only when they have free time which could be later in the day.

---

I believe we have a solid weight room, but I would like to see more equipment such as a dip machine, or cable machines, or more back machines

---

New turf field

---

They should have a better athletic complex it's worse than my highschool

---

The only thing that is annoying is the covid protocols, our facilities are really nice in my opinion

---

group exercise classes ex) body pump, zumba, yoga/pilates

---

Less men

---

specific instructions on how to use the equipment

---

More than one turf field, updated gym equipment, a bigger weight room space

---

indoor track, new gym floor

---

A space for athletes and a space for non Athletes, maybe a yoga or meditation room

---

More excessive/ more advertising of said workout areas

---

More room for free weights

---

Working air conditioning. Another gym. A bigger weight room. Better fields.

---

Shower facilities

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Showers that everyone (especially commuters) are allowed to use in the gym. Student life had to give me access to a residence hall because I'm a commuter and need to workout before school

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Better air ventilation in weight room.

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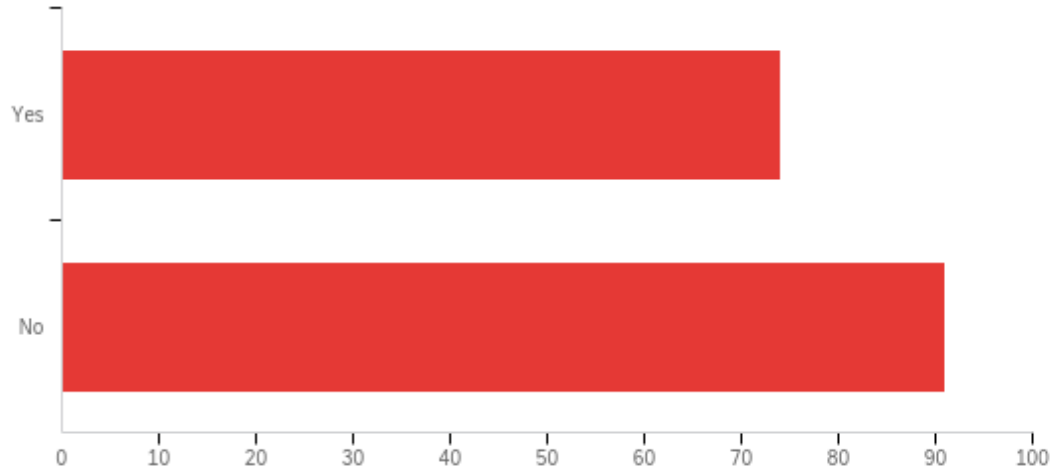
A pool and/or stair climbing machine
A track around the turf field
a stair master machine and possibly an auxiliary gym
gender separation in gym
New tennis courts
Updated weight room
More up to date weight room
The weight room needs updated. Most of the times that I go in to use the weights, there is no room or not enough weights available.
Indoor track, pool, major gymnasium improvements, hex bars in weight room
Pool
Better and new equipment
new turf, more up to date workout gym with more and new equipment
New weight machines
swimming pool
better end zone bleachers so that the band could sit there during games and have it not be so rickety and scary and there'd be more room for fans in the regular bleachers
Updated weight machines
Yoga classes
I really wish they'd update the gym. Most equipment is broken in there. I also wish it was larger.
Better equipment in the gym
Bigger space for weight room
More equipment for students to use. When I do go to the gym, there is a lot of people and I can't get to some of the equipment.
More equipment for females in the weight room
bigger/more accessible facilities with stricter cleaning recommendations
I just get nervous to be judged going to the gym and wish they had someone even a student that could help you start a fitness routine because i want to start weight training but i dont know where to begin
updated gymnasium
Workout Classes
Private rooms that you can sign in and out of, so you dont have to worry about other people bothering you or be self conscious

---





*Figure 1*  
*Q13 - Prior to the beginning of this survey, were you aware of the CDC's recommendations for moderate-level exercise?*



*Figure 1*

#	Answer	%	Count
1	Yes	44.85%	74
2	No	55.15%	91
	Total	100%	165