

ZUMBA'S EFFECTS ON STRESS

An Undergraduate Research Scholars Thesis

by

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I, Sloane Savoini, certify that all research compliance requirements related to this Undergraduate Research Scholars thesis have been addressed with my Research Faculty Advisor prior to the collection of any data used in this final thesis submission.

This project required approval from the Texas A&M University Research Compliance & Biosafety office.

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ABSTRACT

Zumba's Effects on Stress

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The movement of the body has always been a large part of an individual's life. Basic locomotor movements such as walking, playing basketball, or showing a steer. An individual usually is moving from the time they wake up to the time they lay down for the night. College students may be viewed as people that are always moving and always on the go. Never getting a chance to recuperate from extracurricular activities, school, or work. In addition, college students' stress levels elevate during certain times of the year. Finals and midterms are prime times for their stress levels to be elevated. This research begins right as stress levels begin to peak. This study was conducted the day before finals and during the first day of finals at Texas A&M University. A certified Zumba instructor came for two days and taught one 45-minute-long class each day. The participants completed a survey before the class and immediately after they had finished the Zumba class. After both classes had finished and the responses were collected, the study shows that this type of aerobics class influences college students' stress levels. It positively influenced their stress levels. 88% of the responses said that their stress levels decreased. The rest of the respondents (12%) responded that their stress levels did not

decrease or increase, they remained the same. Out of the 44 participants, 43 reported that they would take another Zumba class. This study can further help encourage college students to take time out of their busy schedules to participate in a form of exercise to alleviate their stressors. For this study, Zumba was utilized, however, that doesn't always have to be the activity of choice. Including playing a basketball game, jogging, or taking a yoga class. The reason for this study is to show students that taking a mental break and engaging in some type of physical activity will help lower their stress levels and potentially help them perform better on their exams or projects. The final reason for this study was to bring some sort of joy into the lives of stressed-out college students who were struggling with final exams.

DEDICATION

To family, friends, and faculty that help turn this dream of mine into a reality. None of this would have been possible without my professor, Alexandra Pooley, pushing me to dive deeper into the things I love. Introducing me to research. My very first Zumba instructor, Nicole Koppersmith, for teaching me to fall in love with Zumba. My friends and family constantly encouraged me throughout this process. All of this is only possible because of you.

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Contributors

I would like to thank my faculty advisor, Alexandra Pooley for her guidance and support throughout the course of this research. I would have never even begun to think about undergraduate research without the input from Alex. Her, being with me through every single step of this was the biggest blessing I have received while being at Texas A&M University.

Thank you also go to my friends and colleagues and the department faculty and staff for making my time at Texas A&M University a great experience. Without constant reassurance from so many people, I would have never believed in my ability to complete undergraduate research.

Finally, thank you to my Zumba instructor, Nicole Koppersmith for her ability to teach Zumba in such a way that it captures people into forgetting about the stress of daily life. Nicole was a beam of light every single time I walked into her class as a student and that is why she was the perfect choice to lead the Zumba class for this research.

The data and materials used for *Zumba's Effects on Stress* were provided by every single person who showed up to take part in this study. I would also like to thank everyone who came out during this time to participate in this study. None of this research would have been possible without you.

All other work conducted for the thesis was completed by the student independently.

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NOMENCLATURE

DMT	Dance Movement Therapy
TAMU	Texas A&M University
PEAP	Physical Education Activity Program
PSS	Perceived Stress Scale
SPSS	Statistical Package for the Social Sciences
KINE	Kinesiology

1. INTRODUCTION

College students are constantly on the go from the time they enter a university as a freshman to the time they walk the stage at graduation. Things that fill a college student's schedules range from course load, extracurricular activities such as organizations, fraternities, sororities, professional developments, studying/tutors, part-time or full-time jobs, and creating and maintaining friendships. Most college students want to get the most out of college so they join as many groups as they can, take hard classes to help them in preparation for their careers, and can be known to run themselves into the ground because of how busy their schedules are. The top five stressors in college students are sleeping habit changes, breaks in school, eating habit changes, increased workload, and new responsibilities (Ross et al., 1999). Stress is inevitable in life and college. A type of stress that college students, usually upperclassmen, experience is burnout. Burnout is characterized as overwhelming exhaustion, feelings of detachment, and a sense of ineffectiveness (Pisarik, 2009). All three of those adjectives are frequent feelings for college students who are in their junior or senior year of college but happen at any point in someone's career. There are certain ways to deal with stress to help alleviate stress and anxiety levels in life some would include pre-planning and preparation for certain courses. The most important way to deal with stress is learning to have healthy coping methods when stress levels get extremely high. Every individual copes with stress differently. For some examples when people are stressed, they could take a walk, go for a drive, listen to calming music or go work out to relieve stress. When specifically looking at working out or exercising, stress relief is just one benefit from it.

Individuals might involve themselves in exercises that range from rock climbing to horse riding to yoga and meditation. People typically engage in physical activity for benefit. Some of the benefits of exercising are lowering chances for heart disease, improving cardiovascular endurance, having a better mindset of body image, and lowering stress levels. Exercises range in type, duration, setting, and intensity. Exercises that people see in their everyday life include running, walking, weightlifting, playing a pickup game of basketball, yoga, CrossFit, and Zumba. Zumba is a full-body high intensity interval exercise incorporated with dances styles from Latin America. A typical Zumba class will move from slow-paced songs to fast-paced songs to challenge and improve cardiorespiratory endurance. Zumba was created by mistake by fitness instructor Alberto Pérez from Colombia when he forgot his music for an aerobics class that he was teaching. Instead of canceling class, Alberto decided to use extra music like salsa and merengue that he had with him (Brenscheidt gen. Jost, 2013). During this specific class instead of following a certain workout plan, Alberto just let the music move people, and the room was filled with energy and smiles (Brenscheidt gen. Jost, 2013). From that “mistake” class, Zumba was created and is now one of the top ten rated exercises in the United States. Another reason that people engage in Zumba could be for dance movement therapy (DMT) (Cardas, 2015). DMT allows for some internal healing by being able to express inward emotions through dance. This type of exercise does not have to be structured and technical, it can be spontaneous and free. Whatever feels right to the individual who is looking for a type of relief. A study looking at why women participate in Zumba over other exercises gives readers a great insight into why this type of exercise is becoming so popular. Some of the women interviewed described other types of exercises as boring, restrictive, stressful, painful, and lonely (Neier & Hughes, 2016). These women described Zumba as focusing more on fun and freeing recreation movement over the

final product and physical outcomes. In this same study the women reported gaining socialization experience and comradery from taking a Zumba class regularly (Neier & Hughes, 2016).

People in today's age and time often underestimate how much enjoyment and relief they can gain from exercising (Ruby et al., 2011). Most people do not engage in regular exercise because they either do not know where to start, they have limited knowledge of exercise, or they have reservations about public judgment during exercise. The largest reason that people may not engage in exercise is how unpleasant the beginning of the exercise might be. Jogging the first mile or lifting the first-round weights is usually not the best feeling or experience; people tend to hyper-fixate on the unenjoyable aspects of exercise and therefore this drives people to not engage in exercise at all. Once people can position themselves in the right mindset for exercise, they will be able to tangibly see the benefits from it, people are known to fall in love with exercise. Zumba is not typically the first type of exercise that college students would gravitate toward, but once they take a chance and participate in one Zumba class, their minds might be changed on how they view Zumba. For this specific study, the question that is being proposed is if Zumba can help lower stress levels in college students during a heavy testing period?

Zumba is well known for combining physical activity with psychological components such as body awareness, socialization, and emotional expression (Vrinceanu et al., 2019). Zumba is used by many populations for recreational exercise. There is a stereotype that Zumba is only meant for older generations and predominately females. In counter to that, Zumba is meant for all ages and all genders. This research focuses on college-aged students at Texas A&M University (TAMU) who are going through their final exams and final projects for the Fall 2021 semester. There were no barriers set on these students when recruiting participants, it could have

been a freshman or a post-doctoral students if they were taking classes here in College Station. Male and female students were welcomed along with anyone at any physical fitness level. At this point in the semester, students state that stress levels are at an all-time high. Students will have several deadlines or exams in a short amount of time, so prioritizing energy is imperative. A study conducted by Misra and McKean looked at over 200 college students and what academic stress did to their stress and anxiety levels, and how they spent their free time. Through this study, they found that strategic anxiety reduction programs, better time management, and participation in leisure activities could be used as an effective strategy for reducing academic stress in college students (Misra & McKean, 2000). When thinking of what leisure activities could involve; any type of physical activity or nonphysical activity that help students not focus or think about schoolwork. Some leisure activities could include playing a video game, painting, meditating, reading a book, going on a walk, or working out. Being able to participate in physical activity would be included as a leisure activity that also has additional benefits than just removing oneself from a stressful environment.

In a study completed by Flavia Cardas, she looked at the effects of dance movement benefits on adult-aged individuals while using the Statistical Package for Social Sciences (SPSS) scale (Cardas, 2017). She states that Dance Movement Therapy (DMT) is something that is physically benefit able to any able-bodied person but also extremely beneficial for the emotional well-being of all people as well. The results from Cardas' research supported that the individuals who participated created better body images, improved ways to communicate their emotions, and had lower stress and anxiety levels. Dance Movement Therapy can not only be used as an exercise but is also used by some therapists around the world as a therapy technique. Through DMT, individuals can heal through past traumas that they have not been able to previous work

through (Cardas, 2017). Dance has been used for ages for people to speak and tell their stories without having to physically speak. Zumba is a way for individuals to express themselves in ways they may not have been able to before. Another study completed by a group of authors headed by Tudor Vrinceanu used the SPSS tool along with a saliva test on a population of older individuals living in a retirement home (Vrinceanu, 2019). In this study, they still looked at certain exercises to improve gross body skills, body awareness, and socialization. These are two different examples of studies that used the SPSS tool and were able to extract positive learning data for their research and that is the main reason that the SPSS tool will be utilized for this current research. Using this type of analysis tool will allow participants' names and gender to be kept confidential. Within this program, all the data being used is completely numerical values.

Another research study that focused primarily on Zumba was conducted by Nur in 2017. She goes into detail about what Zumba can do for someone's management of stress. During Nur's research, she looks at the side effects of Zumba on anybody willing to participate. This study investigated the general population and age, for this current study, will be expanding on Nur's idea by looking specifically into college-aged students participating in a Zumba class. This research is pinpointing a certain population of college-aged students to figure out the results of their stress levels after a Zumba class. Hopefully, participants can see the benefit of this intervention and apply it to their own life. In Nur's research, she used a survey that was 20 questions long, this research will resemble that number of questions with only 18 questions within each survey. The use of the SPSS tool will be implemented in this research, along with looking at stress and anxiety levels in participants.

Previous research does not specifically magnify college students as a sought-out population along with looking at what Zumba does to their stress levels. There is research that

looks at college-aged students and how they handle their stress. Then there is research that looks at the benefits of participating in a Zumba class. As of now, there is not enough current research that looks at a set of college students and how Zumba affect their stress levels. For this research, college students will be the subjects and the data will be collected during a heavy examination period. This research hopes to see a decrease in stress levels because of the Zumba class.

2. METHODS

A Google Form was labeled “Zumba Research Interest Form” to collect individuals’ availability. This form was connected through a QR code and emailed out to the student body of TAMU through the Bulk Mail feature. This form was also advertised around campus on Flyers and social media. The flyer was printed out and posted in various places around campus where students would have the chance to see it and scan the QR code. These flyers were placed in the Psychology building, Gilchrist building, multiple Starbucks on campus, Physical Education Building, and various libraries. Along with physical flyers being passed out, students were presented to in their classes in person to explain the opportunities of this research. The presentation to the in-person classes was very simple. The presentation included an explanation of why this research was being conducted, explained what the students were partaking in, and then a request for the students to fill out the online form if they were interested in participating. The classes that were presented in an in-person range from psychology to anatomy and physiology to some classes in the kinesiology program. The flyer is attached in the appendix as Figure A.1. Filling out the interest form did not commit the participant to the research. The interest form contained questions about what day and time would work best for them to attend the Zumba class and if they had any questions for the researcher as well.

After the initial interest form had been advertised around campus for 2 weeks, the interest form was closed to responses. 141 people responded to the Interest Form survey. From the responses it was decided that there would be 2 classes, one on Thursday, December 9th at 11 am and the second class the next day, Friday, December 10th at 2 pm held at the Physical Education Activity Program (PEAP) Building studio room number 115. The first day of data collection was

a Reading Day on A&M Campus which meant no classes were being held. Most students during a Reading Day are focused on studying and preparing for their exams. December 10th was the first day of final exams. These days and times were chosen based on the availability of most of the participants. This research was extremely fortunate that students chose to participate in this study during an extremely stressful period where students did not have much free time. Each of the classes would be 45 minutes in length and participants would only be required to attend 1 of the classes. Nicole Kuppersmith, a trained Zumba instructor had agreed to teach both Zumba classes. Nicole is a lecturer that teaches multiple courses in the Health and Kinesiology Department along with some courses in the School of Military Sciences.

Once the time and date were agreed upon, the sign-up form was sent out via email to all participants to sign up for which day and time they would like to attend. The website that was used was called Signup Genius. Through the website, two classes were capped off at 40 subjects that participants could sign up for. Once the participants had this link, they were able to sign up, change days, and decline the research at any time. The link to the Signup Genius was sent to everyone that responded to the Interest Form, but the recipient had no obligation to continue with the research. Once they have chosen a date and time for the Zumba class the participants received a confirmation email. On the day that a participant was attending a Zumba class, they received a reminder email the morning of the class.

Before and after the Zumba class participants took a pre and post-test survey through their devices. The first section of the pre-test survey was a place where the participant would enter a personalized random code that would allow anonymity. The participants were given this personalized code as they walked into the classroom. We did not take the names of the participants only a code that would be used the before the survey and the after survey. Examples

of these random codes were “AA”, “FF”, or “22”, something simple and easy to remember. Participants were asked to enter their personalized code on each of the surveys. Both surveys contained 10 questions from the “Perceived Stress Scale” (Cohen et al., 1983). A few questions from the PSS were “In the last month, how often have you found that you could not cope with all the things you had to do?” and “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?”. Students then also completed some short answer questions.

The pre-test survey included questions such as what their major was, how satisfied they were with life, self-esteem rating, stress level rating, life stressors, and what they do to de-stress. The answers were a range of short answers and Likert scales. On the post-test survey: questions were asked such as if they enjoyed the Zumba class, what their favorite and least favorite part of the class was if they would take another Zumba class again, stress levels in the same manner of the numerical answer, and then a similar question asking them to describe their stress level as higher, the same, or lower were asked. The questions in the PSS gave the test taker examples of a real-life situation to see if they would label them as stressful events or not (Cohen et al., 1983). The participants answered in a numerical value of 0 being they never felt this way or 4 feelings this way very often for the questions on the Perceived Stress Scale. The questions from the Perceived Stress Scale were not changed or altered from the pre-test to the post-test. The same 10 questions were asked on both tests.

On the day the research has conducted the surveys were made into QR codes, put on a word document, and printed off. The QR codes were posted all around the room and on the door as participants came into the room at the PEAP. This enabled the students to complete the pre-test survey as soon as they entered the room at their own pace. Once students were in the room,

they were instructed on where they could put their stuff and asked to fill out the survey. The students were able to use their own devices to scan the QR code and complete the survey. There was an extra electronic device in case someone needed to use it. Once Nicole got set up and prepared for the class, she told students that they were free to grab skirts that had beads sewn on them or dancing sticks. These items were offered to any of the students who wanted to use them during any part of the class. Students were allowed to grab these items during any of the songs or put them back at any time. Multiple participants wore the skirts and used the dancing sticks throughout the class. After everyone got situated for the class, Nicole began class. She explained things in such detail that people who had never taken a Zumba class would understand what they were doing. During the final song of the instructor-led class, the QR codes were switched out and the QR code for the post-survey was then posted around the room. The class was structured so there was a warmup song, then an array of songs that targeted different types of dancing. Some of these songs were fast-paced which pushed participants and other songs were at a slower pace so that people could catch their breath. In the final, there was a cool down song where Nicole took the class through static stretching so everyone's heart rate could recover. Once the class had finished and the participants filled out the after survey, they were free to leave. Participants were reminded throughout the study that they were free to not complete and withdraw from the study at any time. All participants completed the class with no one withdrawing. There were points during the class when participants had to step outside to catch their breath or grab a sip of water. Nicole's Zumba classes are known to be very difficult but extremely fun and exciting. That is another reason that she was asked to lead these classes for this research. During the first day of data being collected 29 participants completed the class. On the second day, 15 participants arrived and completed the class. In total, all the data collected was from 44 college-aged students

at Texas A&M University. Both males and females participated in this research. The data collected from the surveys were compiled into a large spreadsheet on Google Sheets with a specialized tab for pretest and a tab for posttest. There were additional tabs created to separate each question into its section to view the results.

The data from the Perceived Stress Scale was then processed through the Statistical Package for Social Sciences software to pull out correlational or significant findings. The other data collected from the subjects were then compiled into graphs and charts that are shown in the results chapter.

3. RESULTS

3.1 Perceived Stress Scale Data Analysis

Once the descriptive terms were removed from the responses and it was just numerical data left over it was processed through an analysis tool. The database that processed this scale was the Statistical Package for the Social Sciences (SPSS). After the results from that software were collected the results magnified which questions from both surveys would be viewed as low stress, moderate stress, and high-stress responses. In the pretest, 5 individuals would have been labeled as having high stress. Everyone else in the pretest stage presented as having moderate stress levels. This data was extracted from the answers only from the self-perceived stress questionnaire. In the post-test, there was not a single individual who presented with high stress after taking the Zumba class. Each score of each participant was also measured and recorded from the Perceived Stress Scale. Every single one of the individuals who took the Zumba class reported having either lower stress or similar stress levels after the Zumba class compared to before the class. The T-test statistics computed using SPSS determined the significance of the Self Perceived Stress Questionnaire. The analyses indicate the change in the self-perceived stress of the participants from pre- to post-test fell significantly ($p = .036$; $t = 2.165$). See Table 3.1 to see the table extracted from the SPSS tool. Therefore, it can be stated that participating in the Zumba session had a positive influence on the participants' self-perceived stress over the course of the one workout class. Specifically, post-test scores from the SPSS decreased from 21 to 20 because of participating in Zumba Class. See Table 3.2 to see the table extracted from the analysis tool. These values were extracted from individuals who participated in only one 45-minute Zumba class.

Most of the questions for the surveys were like the questions from the article written by Nur (Nur, 2017). Please refer to Table B.1 and Table. B.2 in the Appendix. In Nur’s research, the results looked like 82% of participants stated that they had lower stress levels. That was a large decrease from before the Zumba class when 96% of participants said they had high-stress levels before the class. Using questions from the same survey encouraged us that we might be able to receive similar positive results. Some of the questions in Nur’s research were “I could not concentrate on something as I kept thinking of other things” and “I felt angry over things that did not happen the way I wanted them to be” (Nur, 2017). The questions in the current research that resembled Nur’s questions such as to rate one’s self-esteem on a scale of 1-10, and short answers to “What in life stresses you out/” and “What do you do to de-stress?”. In the discussion, Nur goes into detail about the benefits of Zumba, not only physically but what participating in Zumba can do for someone’s mental health. That is one of this current research’s goals to help elevate participants' mental health. There is a hope that by having a better mindset from exercising and relief from stress that students would then feel holistically better.

Table 3.1: Paired Differences from Pre to Post Test

Pair 1		Mean	Std. Deviation	Std. Error Mean	99% Confidence Interval of the Difference		T	Df	Sig. (2-tailed)
Pre-Test	Post-Test	1.13636	3.48145	0.52485	Lower: 0.7791	Upper: 2.19482	2.165	43	0.36

Table 3.2: Paired Samples Statistic from the SPSS Analysis Tool

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test	21.3182	44	4.26872	0.64353
	Post-Test	20.1818	44	3.74956	0.56527

3.2 Before Class Question Results

Before the participants started the survey, they were asked to enter the personalized code that they received walking into the room. This code allowed for anonymity to remain during this research. After, they were asked what their major was. There was a large portion of participants were kinesiology majors but there was still a broad spectrum of other majors such as agriculture, general studies, engineering, and education. See Figure 3.1 for the pie chart of majors. There was a wide range of majors, concluding that the flyers were able to reach a wide range of students in different departments. The recruitment of participants would be viewed as successful from this graph but there still could have been a great number of participants and still different majors that were not listed.

A large majority of Kinesiology Majors were represented well through this study representing 34.1% of participants. Also, as surprising engineering made a mark with having

18.2% of participants having a sed major. Other majors included in this research are nutrition (4.5%), education (4.5%), psychology (6.8%), and agriculture (4.5%).

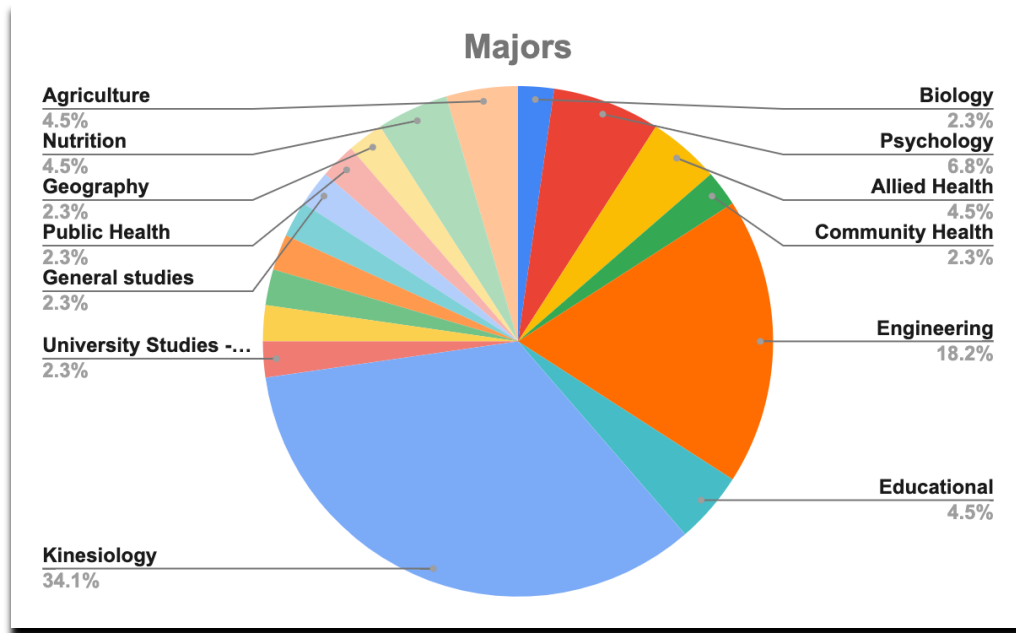


Figure 3.1: Major Pie Chart

The next questions asked about how satisfied the participant was with their life. It was then compiled into 4 different answers ranging from pretty good/satisfied, just okay, happy but stressed about school, and not satisfied. From Figure 3.2 the results show that 47.7% of individuals responded that they felt pretty satisfied with their life and 29.5% answered that they were happy but stressed about school. This is to be expected because final exams were right around the corner. It was a positive result to see that 47.7% of people labeled themselves as being pretty satisfied with life. Figure 3.2 shows how satisfied people are with their life before participating in the Zumba class. It was encouraging to see that already 47.7% of participants were happy with life. We also see a large part of 29.5% were happy with life but also extremely stressed about school. The researchers expected that this research was being conducted for that

time of year. In the research conducted by Ross, they found that most of the stressors in college students would be described as “daily hassles” (Ross et al., 1999). With the results from Figure 3.2, even daily hassles can leave the study feeling satisfied with their life in general.

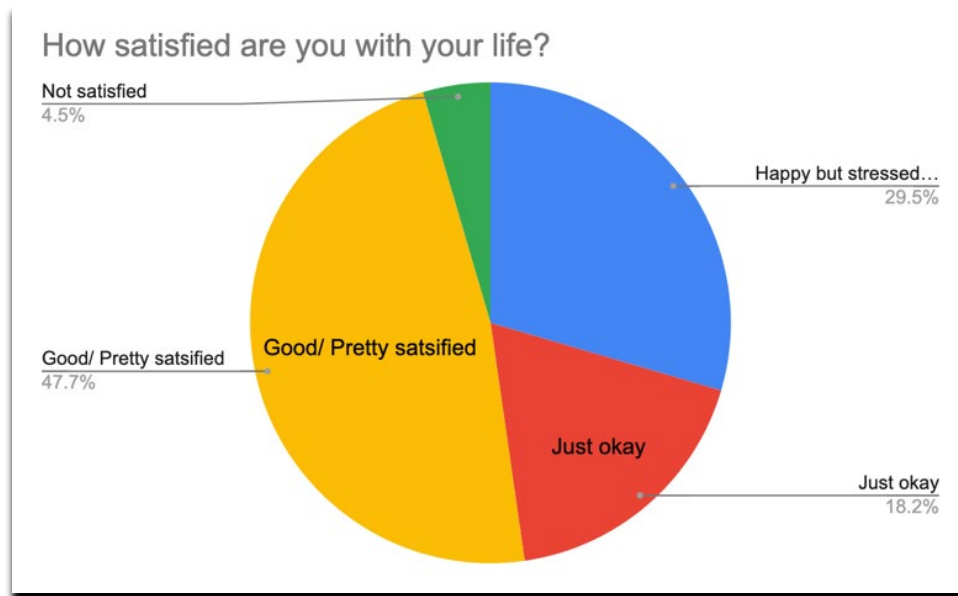


Figure 3.2: Satisfaction with Life Question

The last question that was depicted with a visual from the before survey was the stress level question. The participant was asked to rate their stress level with a numerical value of 1-5. 1 would indicate that the participant was feeling very relaxed and 5 would indicate that they were feeling very stressed. Figure 3.3 shows that most people reported being around the range of 3's and 4's which proves accurate for this certain time of the semester. Another reason for these results could have been students' nervousness about summer plans, graduation, or academic stress. Knowing that most students were having multiple exams and projects due within the next few days helped us understand why some participants' stress levels were elevated before the Zumba class. Another reason that the stress levels may have been raised is the fact they were about to participate in a Zumba class. Some of these students had never taken part in a Zumba

class before and they did not know anyone else in the class. This type of stress or nerves is known as anticipatory anxiety. This type of anxiety is something that people could deal with every day without even realizing it. Anticipatory anxiety could be seen in people's lives. For example, before ordering at a restaurant if they have social anxiety or before taking an exam if they have testing anxiety.

Figure 3.3 is another visual representation of the stress levels reported by participants before taking the Zumba class. Most of the participants ranged in the 3 to 4 area which was expected. In the research conducted by Nur, she reported that 96% of participants claimed that their stress levels were high and only 4% reported having low stress. This current research collected data during a period when stress levels would already be elevated. This decision was chosen to see a higher change in results (Nur, 2007).

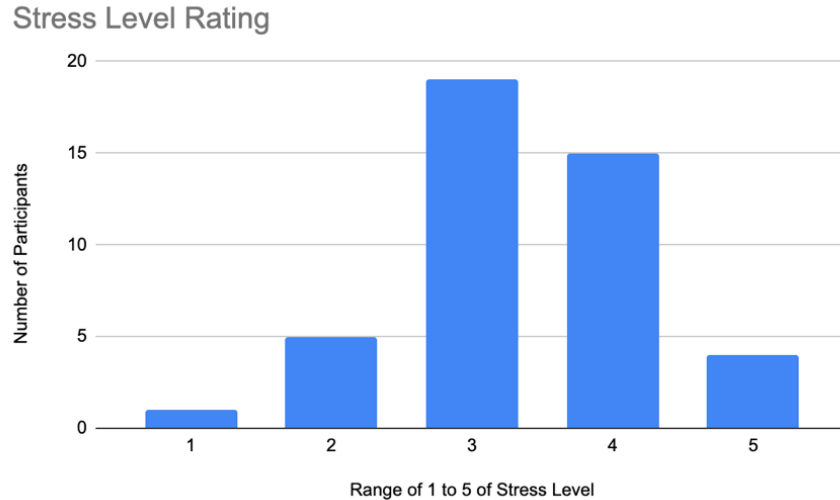


Figure 3.3: Stress Level Before Zumba Class

3.3 After Class Survey Questions

Stress levels were recorded in the after survey in 2 different ways. First, the participants were asked to answer the same question of rating their stress level with a numerical value just as before the survey. The second question dealing with the stress levels asked the participant to describe their stress level as higher, lower, or the same. The 10 questions still were provided through the Perceived Stress Scale. In Figure 3.4 the results show that the stress level rating had completely shifted from 3's and 4's to primary 1's and 2's for the numerical reporting. There was not a single person who reported their stress levels at a 4 or 5 after the Zumba class. The second question on reporting stress levels resulted in that 88.6% reported that their stress levels had lowered. Not a single participant reported that they felt more stress after the Zumba class. These values can be seen in Figure 3.4 and Figure 3.5.

This chart (Figure 3.4) is a visual for the question about stress levels that was asked on the After Survey. From the chart below the participants have completed shifted from 3's and 4's that were presented on the Before survey to mostly 1's and 2's. Positively for this research, no one answered in the 4's or 5's.

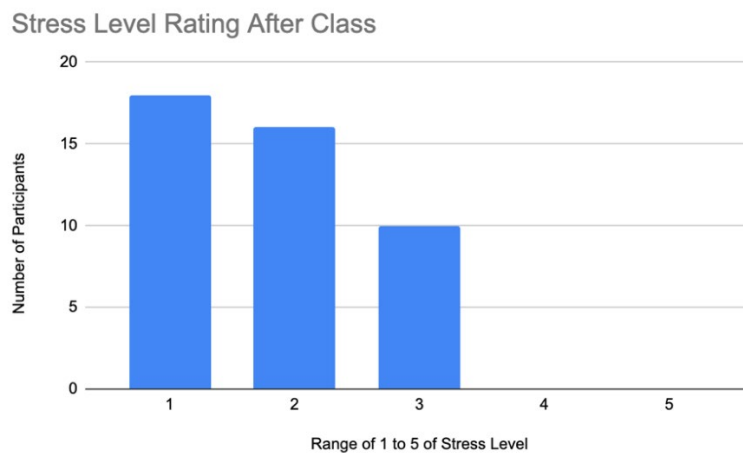


Figure 3.4: After Class Stress Level Numerical Value

This chart is a visual presentation of the same questions above about stress levels with only three possible answers: higher, lower, or the same. Within the chart, 11.4% of participants claimed that their stress levels were the same as before they took the Zumba class. On the other hand, 88.6% of participants said their stress levels were lower after the class has concluded. From the chart, you can see that not one person answered the survey and stated that they had higher stress levels than before the Zumba class. In research conducted by Nur, she received similar results as the results depicted in the chart below (Nur, 2007).

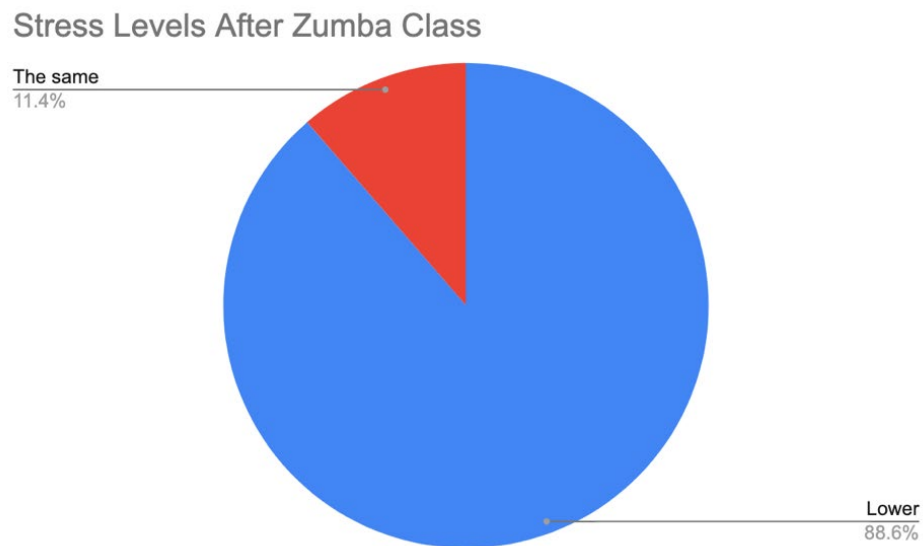


Figure 3.5: Stress Levels After Zumba

4. CONCLUSION

There are multiple benefits of physical activity. Certain exercises or activities will result in a range of physical or mental benefits. For example, weightlifting will increase muscle mass, and running daily will increase cardiovascular fitness. When looking at some of the major medical problems that the United States is currently facing diabetes and obesity are two that are high on the list. In specific type 2 diabetes, occurs usually becomes to someone's diet and lifestyle. Obesity is a disease that is easily prevented if interventions start at an early age. Zumba does not specialize in people of a certain age. Yes, individuals need to be able to understand certain basic movements, but even kids around the age of 7 to 9 can participate in a Zumba class. Zumba is an excellent option to help fight obesity and type 2 diabetes. Zumba falls into the category of improving health and wellness. Participating in a Zumba class can help an individual achieve weight loss, create a healthier heart, and the most important for this research: help de-stress. Zumba is labeled as a high-intensity interval training that has multiple benefits to the overall well-being of any individual. Zumba is also known to help individuals express their feelings, let loose, and just enjoy the movement. In this research, the population that was focused on was college students that were about to begin their finals week at Texas A&M University. This research looked at these students' stress levels during a time of heavy examinations before partaking in a Zumba class and then again after the Zumba class. The data was collected completely based on a subjective survey. There was no tangible variable being recorded throughout this research, just a subjective survey before and after the Zumba class. Previous research shows that certain populations like older aged women, people living in assisted living or people diagnosed with cancer can all benefit from a Zumba class for all the benefits. This current

research was created to focus on only college students who are more than normally stressed to see if their stress levels would either rise or fall due to a Zumba class.

With all the data being collected and then processed through an analysis program, the results were positive for this study. The results show that participants who took the Zumba class reported lower stress levels after completing the class. Not only did the participants report having lower stress levels but their score on the Perceived Stress Scales was also lowered. From the analysis, the results dropped a whole number from 20 down to 21. This may seem like a small victory but compared to the numbers on the visual graphs, one can see that this drop was very statistically significant. The stress reduction caused every single to participate but 1 to report that they would participate in another Zumba class in the future. Knowing that most of the class would take another Zumba class is very encouraging to the researchers. One of the main reasons that this research was conducted was to educate students on the benefits of exercising and especially in a class such as Zumba. Zumba is a type of exercise that which an individual doesn't have to be coordinated or have rhythm, but Zumba is for anyone that can let go of preconceived notions about the exercise and just enjoy the movement.

With the findings of the research, one can hope that readers will understand the enormous benefit of practicing in a form of physical activity. In specific for this research, it is conveyed that taking a Zumba class can also have additional mental and overall benefits along with the physical elements of it. Even if college students only take a Zumba class during finals week or heavy exam periods, the results will replicate, and stress levels will decrease.

There were no other variables taken in this research such as blood pressure, heart rate, or any other measurements. It was completed through an analysis of perceived self-stress. Further research or duplication of this research could go more in-depth with different variables such as

the ones listed above. Another implication that could be added to the next research on this subject would be to have two separate groups complete the surveys. Having one group participate in a Zumba class and then a control group just complete the surveys without partaking in the Zumba class. Another idea for future research would be looking at the effects of stress on a sample group that participates in a Zumba class over a longer period. Possible look at a group of individuals who are willing to take a Zumba class once a week for a whole semester or a whole year. Specifically, here at Texas A&M, data could be collected through a KINE 199 class of Zumba over a full semester. Further research could get more specific with the population and figure out the exam load of students, could look at gender differences, and see if males are more likely to partake? Another aspect to consider is that some participants may not have had finals and some participants could be participating in regular exercise, Zumba, or other exercises. This was not a variable that was looked at during this research but could be in future research looking at exam grades and academic performance after taking a Zumba class. For that experiment, there would need to be a control group to compare grades and performance against.

Every research has limitations and areas that could be improved for future studies. Some limitations that were found during this current research were things such as population size. This study had a good turnout for the classes, but a larger sample size could carry more weight when looking at the statistical measures. The fact that the only variables that were looked at were based on a subjective survey, so relying on the subjects, to be honest, and true to how they were feeling would be considered another limitation to this research. If other variables such as exam grades or blood pressure mentioned above were recorded or looked at, then this study might have some more validity to readers.

No matter one's physical activity ability, gender, or race, Zumba is available to anyone and everyone who has access to the internet, or a class was given by their university or local gym. This research hopes to encourage college students to take their mental health and their stress and anxiety levels into their own hands, to better themselves during stressful times in hopes for people to engage in more regular exercise to receive both the mental and physical health benefits. Any individual can benefit from learning about the results of this research but if college students would be affected by this, then this research would be considered to have a positive outcome. There are so many times that college students overlook things that are freely given to them such as Zumba or aerobic classes offered at the Rec Center. If college-aged students understood the benefits of Zumba, then they would be more likely to partake in these classes.

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APPENDIX A: ADVERTISING MATERIAL

Flyer for advertisement for a student to sign up to get more information about the study. These flyers were posted in the Psychology building, Gilchrist building, and the Physical Education Building on the Texas A&M Campus. Faculty from the psychology, kinesiology, and biology department granted permission for a representative of this research to present to their classes during the time of recruitment of participants. There were physical copies of this flyer printed, as well as digital copies posted on different social media sites such as Instagram and Snapchat and send as a PDF through email. This flyer was circulated on campus physically and digitally for about 2 weeks before the study was conducted. This type of distribution was chosen to best recruit the greatest number of participants for this study.



Figure A.1: Flyer including information about the Zumba study and whom to contact if someone was interested in participating

APPENDIX B: SURVEY QUESTIONS

Survey questions were available to participants before the Zumba class was taken and then immediately after the class was concluded. Participants were not rushed through these surveys and each one took anywhere from about 5-7 minutes. Participants were not allowed to begin the Zumba class until the Before Survey was completed. Please see Table B.1 for the Before Survey. Furthermore, the participants were asked to stay in the classroom until the After Survey was completed. Please see Table B.2 for the After Survey. The answer types vary with each question that is asked. Some responses required a short answer text that would range from 2-to 3 words. For long answers text anywhere from a few words to some sentences was acceptable. The number value questions are explained below the tables.

This table includes the questions that were on the before the survey. The participants were able to start this questionnaire on their phones as soon as they entered the room and scanned the QR code. Participants were not allowed to join in on the Zumba class until the survey was submitted.

Table B.1: Before Survey Questions and How the Participants Were Able to Answer

Before Survey	Question	Answer Type
Question 1	Personalized code	Short answer text
Question 2	Major	Short answer text
Question 3	Explain how satisfied you are with how things are going right now (in general, life and school)	Long answer text
Question 4	How would you rate your self-esteem? Score 1-10. 1 (being low) to 10 (being great) Explain why you chose this rating	Long answer text with a numerical value
Question 5	What number 1-5 would you give your level of stress right now?	1 through 5
Question 6	In the last month, how often have you been upset because of something that happened unexpectedly?	Number value 0-4
Question 7	In the last month, how often have you felt that you were unable to control the important things in your life?	Number value 0-4
Question 8	In the last month, how often have you felt nervous and "stressed"?	Number value 0-4
Question 9	In the last month, how often have you felt confident about your ability to handle your personal problems?	Number value 0-4
Question 10	In the last month, how often have you felt that things were going your way?	Number value 0-4
Question 11	In the last month, how often have you found that you could not cope with all the things you had to do?	Number value 0-4
Question 12	In the last month, how often have you been able to control irritations in your life?	Number value 0-4

Table B.2: Before Survey Questions and How the Participants Were Able to Answer (Continued)

Before Survey	Question	Answer Type
Question 13	In the last month, how often have you felt like you were on top of things?	Number value 0-4
Question 14	In the last month, how often have you been angered because of things that were outside your control?	Number value 0-4
Question 15	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	Number value 0-4
Question 16	What in your life stresses you out?	Long answer text
Question 17	What do you do in your daily life to de-stress?	Long answer text
Question 18	Have you read the information packet that I emailed to you this morning? If so, do you agree?	Yes/No

Note: The number value was 0 through 4. 0 being never, 1 being almost never, 2 being sometimes, 3 being fairly often, and 4 being very often.

This survey was given to participants once the Zumba class has finished. They were asked to finish this survey before they left so that the researchers could see that it had been submitted. The After Survey did include a few different questions than the Before survey.

Table B.2: After Survey Questions and How the Participants Were Able to Answer

After Survey	Question	Answer Type
Question 1	Personalized code	Short answer text
Question 2	In the last month, how often have you been upset because of something that happened unexpectedly?	Number value 0-4
Question 3	In the last month, how often have you felt that you were unable to control the important things in your life?	Number value 0-4
Question 4	In the last month, how often have you felt nervous and "stressed"?	Number value 0-4
Question 5	In the last month, how often have you felt confident about your ability to handle your personal problems?	Number value 0-4
Question 6	In the last month, how often have you felt that things were going your way?	Number value 0-4
Question 7	In the last month, how often have you found that you could not cope with all the things you had to do?	Number value 0-4
Question 8	In the last month, how often have you been able to control irritations in your life?	Number value 0-4
Question 9	In the last month, how often have you felt like you were on top of things?	Number value 0-4
Question 10	In the last month, how often have you felt like you were on top of things?	Number value 0-4

Table B.2: After Survey Questions and How the Participants Were Able to Answer (Continued)

After Survey	Question	Answer Type
Question 11	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	Number value 0-4
Question 12	Did you enjoy the Zumba class?	Yes/No/Indifferent
Question 13	What was your favorite part about the class?	Long answer text
Question 14	What was your least favorite part about the class?	Long answer text
Question 15	How are your stress levels?	Higher/lower/the same
Question 16	Would you participate in a Zumba class again?	Yes/No
Question 17	What number 1-5 would you give your stress levels right now?	Number value 1-5
Question 18	Any questions, comments, concerns?	Long answer text

Note: The number value was 0 through 4. 0 being never, 1 being almost never, 2 being sometimes, 3 being fairly often, and 4 being very often.