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# EXERCISE PROGRAM AT SEACOAST YOUTH ACADEMY

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# **Exercise Program at Seacoast Youth Academy**

By

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Exercise and Sports Science

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Requirements for the Degree of Bachelor of Science  
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### **Abstract**

Worldwide the prevalence of child obesity is increasing, this affects many aspect of their daily lives, including their overall health and quality of life. The purpose of this study was to discuss different options to prevent and combat adolescent obesity in children at an inpatient health facility. This study included children living in an inpatient health facility, The Seacoast Youth center. A majority of these patients are on atypical medications for various reasons including psychiatric illnesses. An unfortunate side effect from atypical medications is weight gain. This study used a variety of different methods including muscular endurance and cardiovascular training in order to fight weight gain in the patients staying at the Seacoast center. Overall it was found that the exercise has a positive impact on the children's mental and physical health. The study itself was difficult in task, due to insufficient materials, but overall a success. Based on feedback from children and staff at Seacoast, they were sleeping better, less moody, and had more energy all due to the exercise provided in this study.

## **Introduction**

The Seacoast Youth Academy is a licensed, South Carolina department of social services child caring institute located in Myrtle Beach, SC. This facility houses up to 64 preteen and teenagers ranging anywhere from 9 to 18 years old. Although there are a variety of reasons that these children are staying here, Seacoast does their best to meet all of their physical, social, emotional and nutritional needs of all the children.

Many children staying at Seacoast are on multiple medications to treat mental illnesses such as depression, anxiety, multiple personality disorder, bipolar disease and psychosis and are prescribed atypical antipsychotic drugs, which treat a variety of symptoms such as distortion, hallucinations and paranoia. Atypical antipsychotics inhibit a chemical messenger in the brain, dopamine [10]. People with these symptoms have hyperactive dopamine signals, and atypical medications slow down the messages. These medications are mostly prescribed to treat schizophrenia, major depressive disorder (MDD) and bipolar disorder [10].

The most common side effect taking these medications is weight gain, due to increased appetite [10]. This is a problem for children at inpatient mental health centers or children on antipsychotics because they do not tend to get enough exercise to wear off their increased appetite. Most of these children also tend to have poor education on how to manage nutrition, and not gain weight. The children need to be prescribed atypical medications, but with the combination of low exercise and increased appetite it is almost inevitable that they will gain significant weight while staying at the Seacoast Youth Academy.

A possible solution to this problem is to have students, professors and doctors all come together to educate and provide a plan for these children so that they do not gain the weight. Educating children on a healthy diet and exercise benefits and a healthy lifestyle can combat weight gain. Provide a plan, with workouts to get the children active. With this program, the children would be well educated on the side effects of the medications they are taking and hopefully prevent other children from even gaining the weight in the first place. For those children who have already gained the weight, the workout and nutrition education could help them lose the weight and get back on track. Without a solution for this, the children will continue to gain weight to unhealthy level, potentially causing obesity and all of the health problems that come with it.

As obesity is becoming more coming in children, it is important that all children know the health complications that come with childhood obesity [1]. Research shows that exercise interventions can be successful at improving physical activity among children from disadvantaged groups [6]. This means that not only are interventions capable of helping children staying at the Seacoast academy, but they can be helpful to many other children who may need help with weight management. School based interventions seem to have the highest success rate with getting across to adolescents about weight management, specifically ones embedded into the school curriculum [6]. These findings support that having a regular based exercise class available to the Seacoast children could have a positive outcome on their health and overall wellness.

The purpose of this report is to discuss a way to treat and prevent child obesity in children on Atypical Medications.

### **Review of the Literature**

#### *Atypical Medications*

Atypical antipsychotics are used most commonly for treating schizophrenia, but can be used for treating other psychological problems as well. These are the most prescribed medication because of their ability to provide antipsychotic aid with lower risk of extrapyramidal symptoms [11]. Although these medications are effective for treating psychotic symptoms, they come with severe side effects. Side effects commonly include: weight gain, impaired glucose metabolism, and dyslipidemia. Weight gain is a more prominent symptom in adolescents than adults [9]. This weight gain tends to be the cause of the other symptoms, dyslipidemia [9]. Studies have also shown that there is association with increased risk of diabetes in patients treated with atypical antipsychotics [11]. Certain antipsychotic agents such as clozapine, olanzapine and chlorpromazine can inhibit glucose uptake through interactions with glucose transporter proteins [9]. These drugs can also induce hyperglycemia [8].

#### *Exercise and Obesity*

Over 1.6 billion adults worldwide are overweight and at least 400 million are clinically obese [10] partly due to the increase of energy intake and the decrease of energy expenditure. This means that on average, people are consuming more calories than they are exercising, leading to weight gain. This has been a steady increase trend over the past 50-100 years in our society [5]. Things such as portion size, availability, cost, and readiness all play factors in consuming. The lack of physical activity is due

to constraints such as time, energy, and availability [5]. Even though there is significant evidence that exercise can reduce body fat percentages, those who are overweight tend to avoid exercise [5].

Obesity is defined as having a BMI greater than or equal to 30, and severe obesity is a BMI of 35 and above. Unfortunately those who need exercise the most tend to have a hard time actually exercising due to their body fat. Most obese people can engage in low intensity activities such as walking, but those who are severely obese have difficulty performing every day activities or any kind of physical activity [3]. Weight loss and physical exercise are the fundamental basis of obesity prevention; exercise can also improve wellbeing and quality of life, especially in younger people [3].

Child obesity is a serious health problem and the prevalence is on the rise. The evidence is that there is about 6.7% overweight/obesity at the preschool level studied in 2010, and estimated to increase to 10% by 2020 [13]. Childhood obesity does not subside with growth. This is a problem, because it is harder for children to lose weight while they are in need of nutrients from food in order to grow [13]. Majority of their weight loss needs to come from physical activity. It is also an issue because these obese children are developing serious health conditions at such an early age, including diabetes, and high blood pressure [13]. Research has shown that physical activity programs, such as PE and sports clubs, have produced favorable effects on body composition, decreased BMI and body fat percentage. They also found a decrease in abdominal fat. This is important because high abdominal fat tissue is a cardio metabolic risk factor for children [13].

### *Exercise and Sleep*

Wong et al found a relationship between exercises and sleep time. This study used variables such as current exercise vs. previous exercise, exercising at different times of the day and even using elite athletes during season and off-season to compare sleep patterns. They concluded that those who were fit had longer total sleep time. The other two influences in longer total sleep time were increased time in bed and shorter sleep onset latency. Sleep onset latency is the time that it takes to accomplish the transition from full wakefulness to sleep.

Sleep onset latency can be influenced by factors such as stress and anxiety [14]. The ability to exercise can help reduce pre-sleep anxiety in insomniacs and decrease depressive symptoms in adults [14]. Meditation is suggested in order to decrease pre-sleep anxiety in order to enhance sleep quality [14]. So exercise may not directly relate to increased sleep time, but indirectly it does. This is because exercise can have the capability to reduce or relieve symptoms such as stress, anxiety and depression, which are all the top causes of sleep deprivation [14]. Regular exercise not only can relieve stress, anxiety and depression, but it also may promote a more efficient temperature down-regulatory system, causing faster sleep onset latency [14].

In this study, many children informed me that on the days that they have been exercising they have slept longer and noticed it was a better sleep than the days that they haven't exercised.

### *Exercise and Depression*

The positive effects of exercise on depression were researched as early as 1905 [6]. In a study including a 6-month at home DVD exercise program, they found

significant results concerning anxiety, depression, and physical self worth in older sedentary participants. In this study by Aguiñaga et al. , titled, found that physical activity among older adults with some severity of depression, found a 50% reduction in depression symptoms [2]. Using previous studies to back up their hypothesis, they conclude leisure time physical activity may significantly reduce depression and anxiety symptoms [2]. They found that the best results with relieving the symptoms came from no cost, easily accessible, low risk exercise opportunities. The science behind exercise improving mood, and relieving symptoms associated with anxiety and depression can be described as: related to distraction from stressful stimuli; increased levels of monoamines particularly norepinephrine and/or serotonin; release of endorphins, stated in similar research conducted by Shi Wong in 2013 [13].

Another study proposed that many studies have observed the positive relationship between exercise and treating depression, but rarely are patients interviewed about their personal experience. This study, conducted by Danielsson et al focused on the experiment through the participant's point of view. Many of the participants described their experiences as the "onset of oneself being capable of carrying out intended actions and taking care of ones health". This feeling relates directly to self-efficacy and the self-determination theory [7]. The described a boost in self-confidence due to being able to carry out activities instructed independently. Not only can physical therapy help injuries and chronic pain, but also it can provide short-term symptom relief of depression [7]. Clients experienced a sense of "relief" and a release of concentration, which they had not previously experienced. This may not be

a long-term cure, but it is definitely a step in the right direction to help those dealing with this mental illness, to feel relief [7].

### **Methods**

The researcher went into Little River Medical Center once a week during seacoast children visit their primary care physician. The physician conducted a regular well-child visit, and prescribes medications as needed. Those who are on atypical medications underwent further testing. The participant will have their resting HR measured using a pulse oximeter.

Next the procedure was explained to the client, specifying that they did a series of exercises to assess their physical condition and to have a base line to compare results of the physical activity program. The participant started by doing a three-minute step test using a step exercise board and metronome set at 92 beats per minute. The client followed the metronome's beat and step up and down to the beat for a minute and a half. Following the test, the participant sat so a heartbeat can be taken using the pulse oximeter. After recorded, the client finished the other minute and a half following the metronome beat. After this time the researcher took a recovery heart rate. Heart rate recovery has been shown to be a predictor of cardiovascular disease and mortality [8]. Heart rate recovery is also an indication of training status [8]. Trained subjects have a faster heart rate recovery than untrained subjects [8].

Next, the client performed pushups, they have the option of regular pushups on a mat, modified pushups in which the client is on their knees rather than their feet. In the case they could not perform either of those they used the bench and do a wall

pushup. The researcher provided a demonstration of the correct movement and body placement for each of the options. The type of pushup is decided and based on what the participant is most confident. The type of pushup was recorded on recording sheet. The client did as many pushups with proper technique as they can in a row without stopping. The final number of pushups was recorded.

Next they performed sit-ups, the researcher showed the client the available hand placements for the correct execution of the sit up, which is either arms by the side or crossed over the chest. They performed as many sit-ups in a row without resting. The final number of sit-ups was recorded.

Next they did seated squats. The researcher showed the client the correct movement of the seated squat, which is both arms out in front of you and bending at the knees and hips until the bottom touches the chair. The client performed as many as possible in a row until failure. The final number of squats was recorded.

Lastly, the researcher took the client either outside into the parking lot, where he or she performed intervals of running and walking in a ten-minute period. If there was inclement weather, the student took the client to the stairs where he or she will go up and down the stairs as quickly as possible, which was determined by the client, for five minutes. These measures will be used to compare from the beginning of the program through the progression of the client.

The other half of this project was completed at the Seacoast Youth Academy twice a week. Each day the investigator led a workout for the participants. This included a ten-minute walking warm up, where the clients walk for ten minutes outside to get warmed up. Next using a box, three clients at a time performed the

same three-minute step test, with heart rate monitors. The researcher kept time and rotated the clients at the end of each three minutes until all of the children have completed the test. Next, the kids I performed two sets of each exercise tested in the clinic: pushups (15-20), sit-ups (20-30) and squats (20-30), followed by a thirty second wall sit at the end of each set. The clients I then stretched to cool down.

Both of these sessions continued for the length of the experiment. At the end of the experiment the number of pushups, sit-ups and squats were compared from the beginning to the end of the experiment, along with heart rate and weight.

### **Reflections**

Overall, just this little amount of additional exercise had a positive impact on the children included in this study. Not only did the children end up losing some of the weight that they had gained from being on the atypical medication, but they also experienced a change in mood. It has been shown that exercise can help improve mood and decrease mood swings or episodes [4]. Because the children are kept in an enclosed facility due to safety and security, they rarely get outside or exercise other than walking from room to room. Being able to exercise and get outside ended up enhancing their moods. The children included in this study have expressed to me their gratitude for me coming and “hanging out with them” a few times a week. Since it is an enclosed facility they rarely have visitors, so having new faces in the facility is exciting and new for them. Although a lot of them didn’t enjoy the actual exercise, they enjoyed being out of their rooms and the benefits of exercise. Many have expressed that they have slept better after starting the exercise program, which is important because a lot of the children are on sleep aid medications such as trazodone to help

them fall asleep. A few of the counselors noticed changes in some of the children included in the exercise program such as decreased anger or decreased “acting up” because the children can use exercise as a sort of release. Studies have shown that exercise can lower aggression in previously aggressive subjects [12].

When I first started this experience, I would have never imagining having as much of an impact on these kids that I have had. I am referred to as a “friend” or someone a lot of the kids are excited to see when I visited the Seacoast Youth Academy. Not only was I able to help the children with weight management, but also a lot of them trusted me and asked me questions about college and looked up to me as a role model because a lot of them have never met someone that has attended college. Many have aspirations to attend college once they graduate high school, relaying to me that they will be a first time college student in their family. Many ask me for advice on how to get into a college and ask what colleges I recommend. It is so important that these children have a positive outlook on school, with everything they have been through a good amount of them have no intention on finishing high school or attending college. It is important that I express to them the importance of a high school or college degree. Studies have shown that physical activity can improve selective attention, concentration and mathematical calculation levels in adolescents [3]. This can be positively transferred to continuing their education.

Growing up in a wealthy area this research was very eye opening for me. The first time I visited Seacoast I didn’t know what to expect. Looking back at the many months that I’ve been going and seeing these children I never would have expected them to have such a big impact on me. They made me realize that not everyone is as

lucky as I am, to grow up and just expect to go and graduate from college and find a job. The children in this facility have been through more than I could even imagine at such a young age and still aspire to change their life around once they can leave. The counselors at this facility really have the children's best interest at heart and do everything they can to make their time there meaningful. Even though working at Seacoast had many challenges, such as dealing with mood swings or episodes and a lot of attitude, the experience is once in a lifetime and I have learned so much.

During this experience I would consider there to be more successes than failures. The kids involved, overall, lost weight and felt more confident. Not only that, but they slept better, and experienced mood enhancements. By having exercise they were able to get out of their rooms and be social even if it was only for an hour twice a week, it is more than they would have gotten without it. Overall, I think this experience was beneficial to everyone involved.

If someone were to complete this project again, there are some suggestions or steps that could be changed to make it better. First, to make it more reliable and consistent, adequate equipment should be used. For example, instead of using the electrical box as the step test out in the field, it would be beneficial to purchase step exercise boards for the facility. In addition equipment such as stopwatches, and heart rate monitors would be valuable. In addition, the equipment would be really helpful on days that it rains.

Having more staff involved would make it much easier on the researcher to take charge of the group of children. A lot of them did not take direction well from someone who has no authority over them. Having staff involved may make it easier

for the researcher to have the children participate fully. Also, there are some children that have limitations, such as not being allowed outside, this makes it a lot more difficult on the researcher because the gym indoors is very small. Having the equipment would allow for more to be done inside. For cases like these, resistance bands and free weights could be useful.

This experiment is extremely important for the subjects involved because so many of them are on medications such as atypical medications and sleeping medications. Exercise can help the state of mind and aid in sleeping [13]. If the children learn to continually exercise, and take this with them once they leave the Seacoast Youth Academy, they could potentially save money and doctors visits by just exercising. Especially those suffering from depression, exercise can be crucial in mood enhancement [7]. Ultimately, these children could experience a better perception of life with understanding the concept of exercise. Since they don't receive the education that provides them with this information, it is important for the people involved in their lives to inform them how much can change just by exercising.

In conclusion this study was successful in teaching the children what they need to know in order to have a better life. Exercising alone can help them be happier and healthier. Exercise can help their mood swings, as well as help control the side effects of the atypical medications they take. It is also important that they share this information to others that may not have the privilege of being taught.

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