



Bryant University

HONORS THESIS

Is Tai Chi a Beneficial Treatment for Anxiety in the Elderly Community?

BY Carolyn Kenney

ADVISOR • Professor Kristin Scaplen

EDITORIAL REVIEWER • Professor Gregg Carter

Submitted in partial fulfillment of the requirements for graduation
with honors in the Bryant University Honors Program
April 2022

Table of Contents

Abstract	1
Introduction	1
Literature review	5
Anxiety	5
Mindfulness Meditation – Background Information.....	6
Mindfulness Meditation – Positive Effects	7
Tai Chi – Background Information	8
Tai Chi – Different Styles	9
Tai Chi – Benefits	10
In summary, these studies suggest that	11
Methods.....	11
Procedures:.....	15
Results	15
Limitations and Future Directions	16
Discussion	16
Appendix A- (Survey Questions).....	18
Appendix B – (Length Practicing Tai Chi vs Physical and Mental Health Ratings).....	23
Appendix C- (Length of Practicing Tai Chi vs GAD-7 Score).....	24
References	25

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

ABSTRACT

This study attempted to explore the relationship between tai chi practice and anxiety in the elderly population. The mental health disorder that I looked at was anxiety, as the elderly often experience anxiety related to contributing factors such as mental and physical decline. Anxiety among the elderly is a great concern as there is an increase in the world's population of individuals aged 65 years or older. This will directly impact health care prices as more resources will have to be distributed to this age population. One solution to this problem is tai chi. Tai chi is a cost-effective way that one can manage their anxiety and simultaneously promotes physical and mental health. To collect data, I distributed a survey to local tai chi studios in Rhode Island where individuals answered questions related to their general mental and physical health and their engagement in tai chi. My study aims to see if those who are regularly practicing tai chi are receiving the same benefits as those who practice tai chi to reduce their anxiety. I hypothesized that the longer an individual practices tai chi, the more likely they are to report excellent physical and mental health. I also hypothesized that the more amount of time an individual practices tai chi, the more likely they are to score minimal anxiety. The results from the data showed that the longer one practices tai chi, the more likely they are to report excellent overall physical and mental health and minimal anxiety. Although more research is required to fully understand the relationship between tai chi and anxiety, this is potentially a promising treatment and a way to manage anxiety.

INTRODUCTION

In 2035, for the first time in history, the United States is predicted to have more of the population be 65 and older than 18 years or younger, and this population is expected to be living longer (Vespa, 2018). As an example, in 1900 it was estimated that there were 3.1 million individuals 65 years or older. One hundred years later in 2000, the estimated population was 35 million (Roberts et al, 2018). In 2015, it was estimated that nine percent of the world's population were aged 65 and older. Current projections estimate this will increase to 12% by 2030. A major contributing factor to the increase of the older population is

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

the increased longevity because of medical advancements. According to World Health Organization, life expectancy across the world has increased more than 6 years from 66.8 years in 2000 to 73.4 years in 2019 (WHO, 2021).

Given the current and expected increase in the population of 65 and older as well as their increased longevity, there will very likely be an increased need for medical services. Medicare which was established in 1965 is the federal health insurance program for individuals aged 65 years or older and was developed as part of the Social Security Act to aid in medical finances for the elderly community (Manchikanti, et al, 2017). However, Medicare was originally designed with the idea of health aid for everyone, until it was eventually agreed open that the option was not feasible (Blumenthal, et al, 2015). Part of the reason why it was decided to solely focus on the elderly is that their health care bills were triple the cost of the younger generation (Blumenthal, et al, 2015). Another reason why is that the elderly often did not have access to health insurance to help pay for their medical cost. Most of this population is retired, therefore they do not have access to health insurance. Also, the population was not likely to have private insurance as they were seen as unattracted to private health insurance (Blumenthal et al, 2015). The price of Medicare is gradually increasing. Between the years 2017 and 2027, there is a projected increase in Medicare spending from \$590 million in 2017 to \$1.2 trillion in 2027 (Foll, et al, 2019 This spending is expected to continue to grow at a faster rate in recent years due to increased enrollment, increased use of services, and the cost of health care prices rising. This is a concern to society as Medicare is a major role in the health care system and our GDP. In 2016, Medicare accounted for 15% of the federal budget. (Foll, et al, 2019). There is also a projected increase in Medicare spending as a share of the gross domestic product (GDP) is increasing, from 14.7% in 2017 to 17.5% in 2027 (Medicare as a Share of the Federal Budget, 2016).

There is a lack of diagnosis and focus on anxiety among those who are elder, despite the increase in prevalence. A recent study showed that the prevalence of threshold and subthreshold anxiety disorders in nursing homes was 11.7% (Creighton et al, 2018). One potential cause for the lack of diagnosis is ageism. The World Health Organization defines ageism as having a “certain stereotype, prejudice, and discrimination towards others or oneself based on age” (WHO, 2021). Unfortunately, evidence of ageism exists on a global

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

level. A recent study by Officer and colleagues (2020) conducted a World Values Survey including 57 different countries and their results classified 34 out of the 57 countries as being moderately or highly ageist (Officer, et al, 2020). They further show that at least one in every two people included in this study had moderate or high ageist attitudes (Officer, et al, 2020). This is a serious issue as a complication of ageism can be unconscious self-stereotypes (Officer, et al, 2020). When an individual is continuously being stereotyped, they will often start to believe they deserve the discrimination they are experiencing. This consequence can be linked to poor physical and mental health, such as anxiety, in older adults (Officer, et al, 2020). Ageism has also been shown to have direct negative effects on an individual's behavior. The World Health Organization reports that ageism "increases risky health behaviors such as eating an unhealthy diet, excess drinking, and smoking, which all reduces the individual's quality of life" (WHO, 2021). It is important to address the problem of ageism as it is so detrimental and still prevalent in our society.

Anxiety disorders have been studied since modern psychiatry in the last 18th century and have now become a prevalent disability in the United States. The Global Burden of Disease (GBD) study estimated that anxiety disorders contributed to 26.8 million disability-adjusted life years in 2010 (Whiteford, et al, 2013). Anxiety can cause an individual worry over no particular stimulus that can last for occurring days and can be very difficult to manage (Diagnostic and Statistical Manual of Mental Disorders). Anxiety is mainly treated through cognitive behavioral therapy, and/or antidepressants (Sharma, et al, 2013). However, the use of therapy and antidepressants were only estimated to alleviate symptoms in 50% to 60% of patients (Diagnostic and Statistical Manual of Mental Disorders). Symptoms of anxiety and related conditions include shortness of breath, restlessness, being easily fatigued, irritability, and sleep disturbance (Diagnostic and Statistical Manual of Mental Disorders). Therefore, effectively treating symptoms of anxiety in an individual can improve their daily life, mood, and cognitive functioning. Anxiety left untreated has been correlated with the significant personal and societal costs that are related to frequent primary and acute care visits, decreased productivity, unemployment, and impaired social relationships (Anxiety Disorders, 2022). The idea of worry emphasizes the prefrontal cortex. The concept of worry comes from the negative valence system where the system recognizes a potential threat, in which harm may

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

potentially occur but is distant, ambitious, and of low probability (Crocq, 2017). The prefrontal cortex is in the frontal lobe that is responsible for adaptive control of behavior, personality expression, and decision making (Park, et al, 2017). Current theories suggest that dysregulation of the connections between the prefrontal cortex and amygdala underlie stress-induced anxiety (Van Bodegom, et al, 2017). When sensory information enters the amygdala, it is processed and relayed to the neurons in the central nucleus. When the central nucleus becomes active, the hypothalamic-pituitary-adrenal axis (HPA) becomes activated. When the HPA is activated, it releases the stress hormone cortisol, which can be measured in high levels in an individual when they are experiencing anxiety (Van Bodegom, et al, 2017). The prefrontal cortex inhibits the response of the amygdala by deactivating its central nucleus, deactivating the HPA (Van Bodegom, et al, 2017).

An alternative to treating anxiety with therapy and antidepressants is the use of mindfulness meditation. The objective of mindfulness meditation is to reduce anxiety and help individuals understand their thought patterns and ways of thinking and to prevent thinking back into that anxious state of mind (Hofmann, et al, 2017). It constitutes accepting one's thoughts, emotions, and experiences that are in the present in a nonjudgmental matter (Hofmann, et al, 2017). It is also about reaching a heightened level of awareness by focusing on thoughts and breathing. Individuals suffering from anxiety have gained interest in mindfulness meditation as it allows them to actively treat themselves.

Another effective treatment for anxiety is physical activity. Physical activity has been proven to be an effective treatment for anxiety and related disorders. Studies also show that out of the general population, people who engage in more physical activity have a reduced risk of being diagnosed with anxiety disorders and experience less frequent, and severe anxiety symptoms (Anderson, et al, 2013). One of the ways that physical activity helps alleviate symptoms of anxiety is through the regulation of stress responses of the hypothalamic-pituitary-adrenal (HPA) axis. The HPA function is to maintain physiological homeostasis through a feedback loop. One of the ways it does this is by regulating the effect of stressors in our brain by monitoring numerous physiological processes, such as metabolism, immune responses, and the autonomic nervous system (Van Bodegom, et al, 2017). Studies have shown that physical

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

activity has a potent impact on improving hippocampal functioning and stimulates a broad range of neurogenic processes important for proper brain function (Anderson, et al, 2013). Another way physical activity affects the body is by its ability to influence the inflammatory system. A protein associated with the inflammatory system is pro-inflammatory cytokine C-reactive protein (Kandola, et al, 2018). Anxiety is associated with high levels of protein (Kandola, et al, 2018). Physical activity is shown to have anti-inflammatory properties that aid in mediating the inflammatory pathways, responsible for the secretion of the pro-inflammatory cytokine C- reactive proteins (Kandola, et al, 2018).

A treatment for anxiety that combines both mindfulness meditation and physical activity is tai chi. Tai chi has been shown to increase individuals' confidence in their ability to treat their symptoms (Bao, et al, 2015). This practice involves slow, gentle, and controlled movements that are predicted to increase awareness and release muscle holding patterns and their associated emotions caused by stress and anxiety. Also, these movements along with coordination are believed to improve the function of the nervous, cardiovascular, respiratory, and musculoskeletal systems, improving physical fitness and the overall quality of life. Tai chi results in calmness, the release of stress and tension, and heightened awareness of the body about its environment. This is done by nurturing the full integration of body, mind, ethics, and behavior, promoting psychological well-being (Guo, et al, 2013). The benefits of tai chi are related to memory, concentration, depression, and blood pressure which are all an important part of decreasing anxiety (Sharma, et al, 2018). At the psychological level, tai chi has been found to have positive improvements in emotional wellbeing, satisfaction with life, and positive self-perception (Bao, et al, 2015).

LITERATURE REVIEW

Anxiety

Anxiety among the elderly is a great concern as the number of older adults in the general population is increasing. Anxiety in the elderly is also one of the major causes of health care access contributing to higher prices in health care among the general population and individual costs (Balsamo, et al, 2018). One study (Song, et al, 2014) focused on the problems of anxiety in the elderly. The main issue found in their study was the lack of diagnosis and

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

focus on the anxiety of those who are elderly. One of the reasons why it is difficult to diagnose the elderly with anxiety is that older adults will experience the effect of anxiety or interpret the effect of anxiety differently than the younger population. An example of this is that older adults are more likely to report health concerns compared to younger adults (Song, et al, 2014). One of the reasons for this is that the older population is more focused on themselves and how they are feeling, rather than the younger population whose primary concerns are more focused on finances, family, and their career (Song, et al, 2014). Older adults are also more likely to experience anxiety directly, as age-related factors arise in self-reported communication of the experiences such as physical illnesses, mental declination, and neurodegenerative diseases (Song, et al, 2014).

One of the main factors that cause the elderly to experience anxiety is when their physical functions decline, including their constitution, daily living activities, along with the mental pressure they have on them. Once a person grows older, their physical and mental conditions change and their characters gradually develop toward self-centered, moody, stubborn, along with other lonely trends. Also, when a person ages, they are more likely to acquire acute and chronic diseases, which include tension and fear. Anxiety symptoms often are coexisting with age relating symptoms, which results in their anxiety being ignored. This has caused mental health disorders to become one of the natural killers of the elderly (Song, et al, 2014).

Although drug therapy is effective, it still has strong negative side effects including the drug having a slow effect, addiction, and holds a strong psychological effect (Song, et al, 2014).

One of the alternative forms of medicine to treat anxiety is mindfulness meditation. Patients have gained increased interest as it allows them to actively treat themselves (Song, et al, 2014). An alternative form of mindfulness meditation is tai chi. Tai chi incorporates low physical impact body movements with deep breathing and mental concentration which relaxation is possible.

Mindfulness Meditation – Background Information

Mindfulness meditation was first used as a clinical intervention in a course at the University of Massachusetts Medical School in Worcester, Massachusetts in 1979 developed by John Kabat-Zinn (Wielgosz, et al, 2019). This course was designed between the influences of Buddhism, psychotherapy, and Buddhist tradition. The word mindfulness comes from the

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

term sati; a form of mental stability that prevents attention from being captured by distractors. The purpose was to release stress in ambulatory patients with chronic pain. Mindfulness mediation has now evolved for cognitive therapy and other therapeutic needs. One example from the study (Wielgosz, et al, 2019) is a form of therapy that incorporates mindfulness mediation is dialectical behavior therapy, which supports the development of emotion regulation, distress, tolerance, and interpersonal effectiveness (Wielgosz, et al, 2019). There are two styles of mindfulness mediation including focused attention and open monitoring. Focused attention is when the participants seek to maintain a chosen object of mediation and to keep their focus, while open-monitoring creates a present awareness of the mind (Wielgosz, et al, 2019). Mindfulness mediation is a concentrated form of mediation that has participants focus attention on a single stimulus. They are guided to redirect their focus back to their stimulus when their attention drifts. It constitutes being aware of one's thoughts, emotions, and experiences that are happening in the present in a nonjudgmental matter (Hofmann, et al, 2017). It is also about reaching a heightened level of awareness by focusing on thoughts and breathing. The object of mindfulness meditation to reduce anxiety is to help them understand their thought pattern and ways of thinking and to prevent thinking back into that anxious state of mind (Hofmann, et al, 2017).

Mindfulness Meditation – Positive Effects

Research showed that participants who practiced mindfulness-based- mediation began to develop the concept of meta-awareness and present-centered awareness. Meta awareness is defined as the ability of an individual to be aware of their current thoughts and be able to process them. It gives the person the ability to control their quality of attention and the context behind it. Present centeredness is defined as bringing the focus of attention to the present moment. This can help prevent patients from falling into a chain of thoughts from the past, or the future. With the use of sensory and body sensations to recognize only present thoughts, the thoughts are then no longer perceived as reality, but as an examination of their thought (Wielgosz, et al, 2019).

A major issue associated with mindfulness mediation is the ability to be undistracted throughout the practice. One study states this is a concern as mindfulness mediation uses

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? ***Honors Thesis for Carolyn Kenney***

multiple cognitive functions that enter the network throughout the brain (Wielgosz, et al, 2019). Another explanation for the cause of reduced anxiety associated with mindfulness mediation is the psychopathology behind it. Psychopathology is known to originate in the dysregulation of underlying cognitive and affective systems (Wielgosz, et al, 2019). Besides being aware of one's present thought, the other main goal of mindfulness mediation having compassion towards oneself and others stated in (Wielgosz, J, et.al 2019). In this study mindfulness, mediation was used throughout an 8-week program that included one 2.5-3.5-hour session per week. After the 6th week of mindfulness mediation practice, the participants were asked to practice it in their everyday tasks. The participants were able to enhance emotion awareness, alter emotional reactivity, promote cognitive reappraisal, and alter their reward processing (Wielgosz, et al, 2019). This is explained by having improved interception, or the perception of internal bodily states. Mindfulness mediation is also associated with lower activation of the amygdala and insula during exposure to a personally relevant stressful stimulus compared with standard cognitive-behavioral treatment and lowered stress-related activations (Wielgosz, et al, 2019).

Tai Chi – Background Information

Tai chi is a Chinese traditional martial art based on the Chinese traditional philosophy of health-preserving, health science, medicine, aesthetics, and other disciplines. Its method lies in harmony between man and nature and internal and external processes while having the characteristics of dredging the channels, improving the spirit of oneself, and slowing movement (Sharma, et al, 2015). Tai chi originated in the village of Chenjiagou in the Wenxian county, Henan province, in the Ming and early Qing dynasties. Chen Wangting was historically recognized as the first person to create and practice tai chi using the Chen style (Yucheng, et al, 2013). This traditional style of tai chi is to evolve both within and outside the Chen family. Chen Changxing disappointed his family by bringing the Chen style outside of the family to teach his apprentice, Yang Luchan. Yang, later, created the Yang Style in which he passed the routine to his two sons: Yang Banhou, and Yang Jianhou. Yang Banhou developed the small frame of the yang style, where Yang Jianhou's son, Yang Chengfu, introduced the Yang style to the public (Guo, et al, 2013). Wu Yuxiang learned tai chi from his fellow villager Yang Luchan and acquired knowledge of tai chi from the master

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? ***Honors Thesis for Carolyn Kenney***

Chen Qinqing. With the assistance of his nephew Li Yishe, Wu Yaxiang eventually develop the formation of his own unique Wu style. Quan You and his Wu Jianquan developed the fourth style of tai chi into Wu (Guo, et al, 2013). Quan learned tai chi from Yang Luchan and Yang Banhou and eventually refined Yang's small frame approach to give rise to the Wu style. The fifth and most recent style comes from Sun Lutang, who learned from the Wu style descendant Hao Weizhen (Guo, et al, 2013).

Tai Chi – Different Styles

Tai chi is performed by slow gentle movements where the practitioners shift their weight between their feet while moving their arms. It combines martial arts, meditation, imagery, and deep breathing (Bao, et al, 2015). It consists of a slow flow of dance-like movements, that help with mental concentration, physical balance, muscle relaxation, and relaxed breathing (Bao, et al, 2015). There are five different styles of Tai Chi including Chen, Yang, Sun, Wu, and W'u (Guo, et al, 2013).

Standards and classifications have been developed for certifying practitioners in all classic styles of tai chi. Other standardized forms have been created including the simplified 24-form, push-hands, and sword routines. Tai chi has been included in the Asian Games, both Junior and Open World Wushu Championships, and Jiaozuo International tai chi Competition, which provide performance and competition platforms for practitioners (Guo, et al, 2013).

Other styles of tai chi include the static stance practice, the single form practice, combination practice, and the push hand practice. The Static- stance practice is the fundamental skill for practitioners that includes, the Wuji pylon stance, Chuan- character pylon stance, and the palm pylon stance. (Guo, et al, 2013). Practicing these stances build strength in the legs and hips and helps establish a strong posture and foundation for learning and practicing more complicated forms and movements. The single form practice can be used to alleviate pain and fatigue in specific parts of the body and is one of the most basic ways of learning tai chi. An example of a movement is the Cloud Hands, which used the waist as a pivot and drives the arms for coordination, exercising the torsi and shoulder joints. (Guo, et al, 2013).

Combination practice refers to the practice of movements contained within a form. This kind of practice plays an important role in mastering correct actions from developing fundamental skills for engaging in more complicated routines. Combination practice increases the number

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

of muscles and joints involved which increases the benefits of improving flexibility, reducing fatigue, and enhancing fitness (Guo, et al, 2013). The push-hand practice is a barehanded training routine performed between two practitioners. There are several forms of push-hand practice including fixed-step push-hand, single-hand push, double-hand push, and moving-step push-hand, all of which require coordination of the upper and lower limbs (Guo, et al, 2013). They are eight techniques in the basics of the push-hand practice which are warding off, rolling back, pressing, pushing, plucking, splitting, elbowing, and leaning (Guo, et al, 2013).

Tai Chi – Benefits

Focused movements of tai chi may counteract erratic movements and thoughts by increasing awareness and eventually releasing muscle holding patterns and their associated emotions caused by stress (Bao, et al, 2015). The benefits of tai chi are related to memory, concentration, depression, and blood pressure which are all an important part of decreasing anxiety. At the psychological level, tai chi has been found to have positive improvements in emotional wellbeing, satisfaction with life, and positive self-perception. While adolescents are growing up, they go through a development stage that is described by a high number of psychological and physical changes. During this stage, the development of the adolescent's self-concept is critical, as it can come into conflict with their emotions, behavior, academic performance, and social adaptability (Bao, et al, 2015). Tai chi has also been shown to improve self-efficacy which can cause a causal chain of factors that are directly related to determining behavior. One study showed that tai chi provided a mastery experience that increased participants' confidence about their ability to manage their symptoms (Tong, et al, 2018).

The dynamic and controlled movements along with coordination which has been believed to improve the function of the nervous, cardiovascular, respiratory, and musculoskeletal systems, enhancing physical fitness, and improving the overall quality of life (Tong, et al, 2018). The movements result in calmness, the release of stress and tension, and heightened awareness of the body about its environment. This is done by “nurturing the full integration of body, mind, ethics, and behavior, promoting psychological well-being “(Guo, et al, 2013).

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

When practiced regularly, tai chi has been shown to lower blood pressure as well as improve lipid metabolism (Guo, et al, 2013). In addition, it has been proven to increase the function of the cardiovascular system. The cardiovascular system is improved by increased vital capacity, maximum ventilatory capacity, and oxygen consumption (Guo, et al, 2013). Studies have also indicated a positive influence on protecting lymphocytes and enhancing immunoregulation of cells, which goes to improve cellular immune function. The cellular immune function is improved by the increase in the ratio of T-helper to cytotoxic and regulatory T-cells (Guo, et al, 2013). Tai chi has also proven to have a beneficial effect on balance, or on delaying the decline of balance capacity in middle-aged and older adults which reduces the frequency of falls. Although there is little evidence, tai chi is predicted to be an effective, safe, and practical intervention for maintaining bone mineral density (Guo, et al, 2013). It is also shown to improve sleep quality by helping to overcome sleep disorders. Training can also have a positive effect on brain volume and cognition, especially in older adults. One study found that when tai chi is practiced regularly, it increases brain volume and memory, reducing the risk of developing dementia and cognitive decline (Guo, et al, 2013).

IN SUMMARY, THESE STUDIES SUGGEST THAT

Tai chi is a promising way to decrease anxiety and improve the overall well-being of the older population. This research study attempted to determine whether tai chi was associated with mental health ratings in the Rhode Island elderly community. To gather the data, I went to local tai chi studios in Rhode Island and distributed anonymous surveys for regular tai chi practitioners to take, which asked questions related to the length of time practicing tai chi, and mental and physical health. I hypothesized that individuals who practice tai chi longer would report excellent mental and physical health. I also hypothesized that the longer individuals practice tai chi, the more likely they are to score with minimal anxiety.

Methods

Participants: Participants included 16 tai chi practitioners from three local tai chi studios: Villarias, Its My Health Wellness Collaborative, and Internal Arts. Participants' ages ranged from 35 years old to 64 years old. The demographics mostly consisted of male, Caucasian

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

practitioners. The average length the practitioners have been practicing tai chi is about one year. A breakdown of the demographics can be viewed in figures 1 -3 respectively.

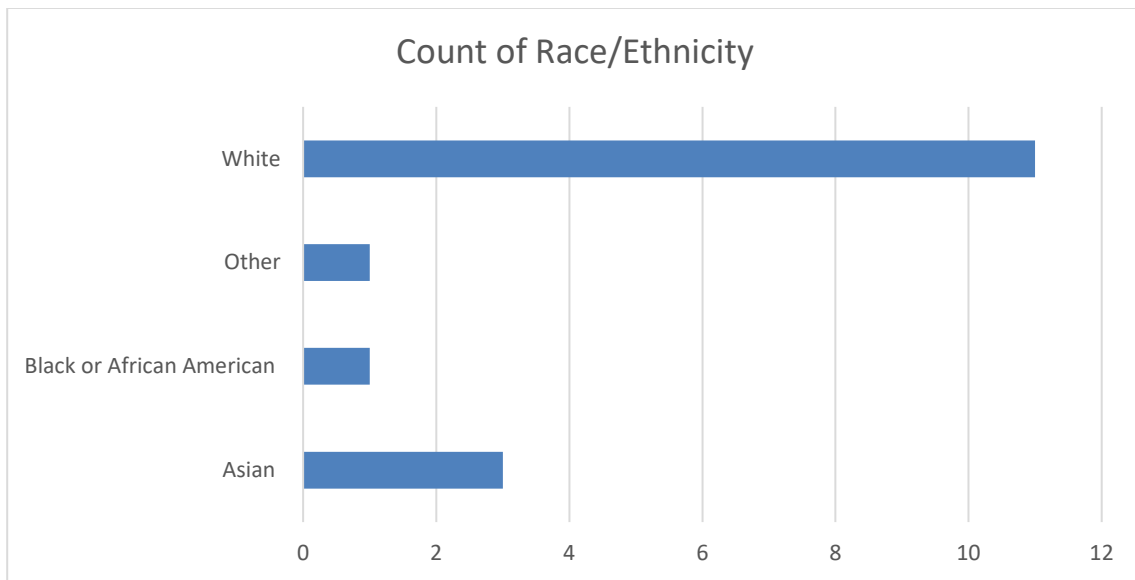


Figure 1 – Number of Participants Categorized as Their Selected Race

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

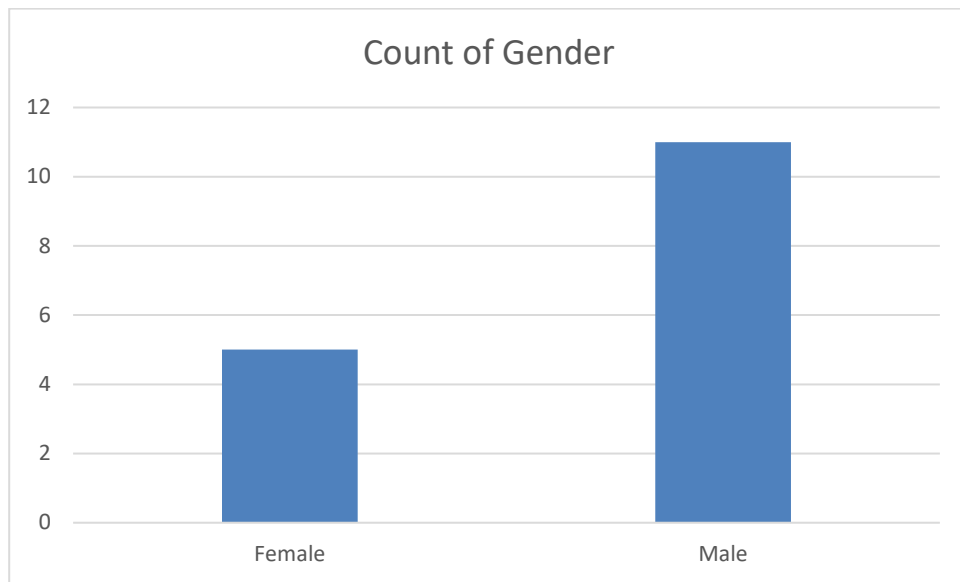


Figure 2 – Number of Participants Categorized as Their Selected Gender

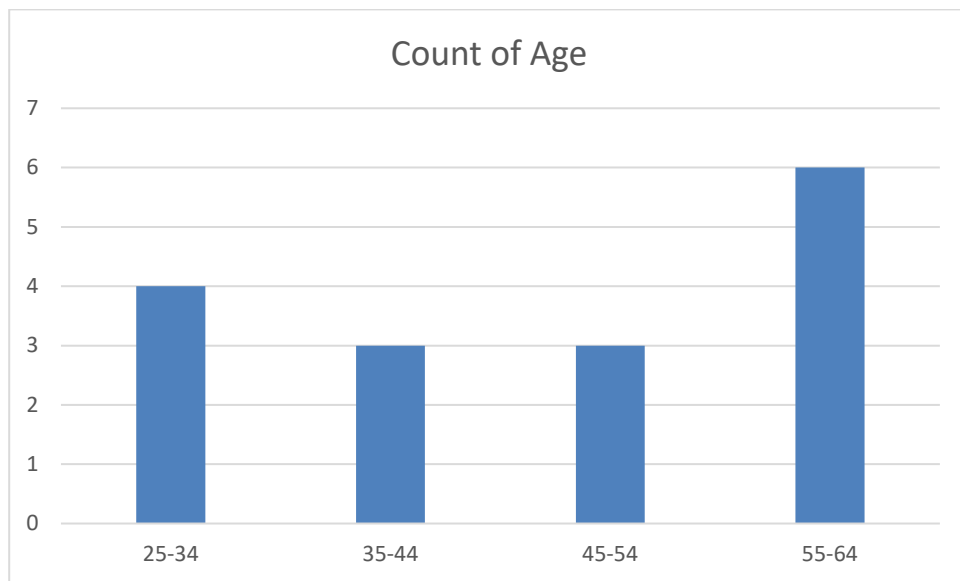


Figure 3 – Number of Participants Categorized as Their Selected Age Group

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

Materials: The Generalized Anxiety Disorder- 7 Scale (Spitzer, Generalized Anxiety Disorder-7) was used to measure anxiety levels in participants. This survey is a self-reported measure based on the score of the participant’s answers. Figure 4 below shows the GAD-7 survey and the questions used.

GAD-7

Over the <u>last 2 weeks</u> , how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Total Score = Add Columns + +

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4 – GAD-7 Survey

To interrupt the results, SPSS was used to analyze the data. The data was inputted to SPSS and was able to calculate the total GAD-7 score for each participant. From here, I was able to view the correlation between the total GAD-7 scores and the length of time practicing tai chi. This correlation was able to be seen by a plotted scatterplot graph, which can be viewed in

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community? *Honors Thesis for Carolyn Kenney*

appendix B. I was also able to calculate the person's correlation coefficient. For the categorical data, I was able to calculate a person's chi-square.

Procedures:

I contacted the following studios to ask for their blessing to distribute the survey: Villarias, Its My Health Wellness Collaborative, and Internal Arts. I left my survey there for a cycle of classes to have the regular practitioners fill them out. The survey was distributed to regular practitioners of tai chi and results were collected anonymously. Participants were informed that they were participating in a study on how tai chi is beneficial for the overall population. They were told that we hoped to learn how tai chi can improve mental and physical health and how it can help the overall society in terms of access and cost to healthcare.

The survey consisted of multiple demographic questions asking them about their age, gender, and race. I also was able to assess how long they have been practicing tai chi. To assess anxiety related to tai chi, I asked if they have ever been diagnosed with anxiety and if so, was the diagnosis before or after they started tai chi. I also asked they have if they were diagnosed with anxiety and if they were ever prescribed medication for it. The follow-up question asked if they were prescribed the medication before or after they started tai chi, and if they still take it after starting tai chi. I have also asked them to fill out the GAD-7 survey to have a general idea of what their overall mental health reflects as they are practicing tai chi.

To assess their general physical health, I have asked them to rank their overall health based on the number of times they had to see their primary care doctor or any specialty doctor within the last 6 months. I also asked if they are enrolled in Medicare and if so, how much they spend through that in 6 months. Finally, I asked them to rank their overall mental and physical health. The survey used can be viewed in appendix A.

Although the survey did ask what style of tai chi the practitioners practiced the most, many of the participants answered that they did not know what style. It is inconclusive what style of tai chi was practiced the most out of the 16 participants.

Results

I hypothesized that the longer a person practices tai chi, the more likely they are to report excellent physical and mental health. The results showed that tai chi was not statistically

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

significant and unclearly related to reporting excellent physical health, $X^2 = (6, N = 16) = 7.667, ns, V = 0.489$. The results also showed that tai chi was also not statistically significant and unclearly related to reporting excellent mental health, $X^2 = (6, N = 16) = 7.567, ns, V = 0.49$. The results can be seen in Appendix B. These findings are also not statistically significant due to the number of participants. I also hypothesized that the amount of time practicing tai chi will lead to scoring with minimal anxiety. As hypothesized, tai chi was not statistically significant although negatively correlated with scoring minimal anxiety, $R(2) = -.489, ns, P = 0.07$. The results can be seen in Appendix C. This finding is also not statistically significant also due to the number of participants.

Limitations and Future Directions

One of the limitations of this study is the number of participants who completed the survey as there were only 16 participants. Another limitation was the amount of anxiety assessed in the participants. Many of the participants scored with minimal anxiety, not leaving space for differentiation between the scores. This study also lacks control for tai chi, including mindfulness training, physical activity, antidepressants, and/or cognitive-behavioral therapy. Future longitudinal studies could look at the benefits of tai chi in a nursing home while controlling for the previous factors listed.

Discussion

The data showed that the participants had very minimal anxiety. Although it is unclear if the data is correlated with practicing tai chi. The data could mean those who practice tai chi are more likely to report minimal anxiety, or it could be the casualization where those who have minimal anxiety are more likely to practice tai chi. The data did not have a lot of variety on participants being diagnosed with anxiety when they were diagnosed, or if they took medication before or during practicing tai chi. Therefore, it is unclear if tai chi caused the reports of minimal anxiety levels.

Tai Chi is recommended as it is inexpensive, safe, and can be tailored to people of all ages. Any person of age who have various disabilities can practice tai chi. Practicing tai chi to manage one's anxiety has become one of the more favorable factors of tai chi. This way the person feels in control of their management and helps the person to focus on themselves, not

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

the disease they are trying to manage. It also takes away the social stigma related to conventional therapies such as medications and behavioral therapy. Improving the physical and mental health of the older population is beneficial to the overall population as it can help limit the amount spent on Medicare and help limit the number of patients that need to be seen.

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

Appendix A- (Survey Questions)

Survey

You are invited to participate in a study on how tai chi is beneficial for the overall population. We hope to learn how tai chi can improve mental and physical health and how it can help the overall society in terms of access and cost to healthcare. You were selected as a possible participant in this study because you are a regular practitioner of tai chi.

If you decide to participate, you will take a 5-minute survey. This survey has no risks, although it does ask about mental health conditions which can be sensitive for some individuals.

Any information obtained in connection with this study will remain confidential and will not be disclosed to the general public in a way that can be traced to you. In any written reports or publications, no participant other than the researchers will be identified, and only anonymous data will be presented.

Your participation is totally voluntary, and your decision whether or not to participate will not affect your future relations with Bryant University or its employees in any way. If you decide to participate, you are also free to discontinue participation at any time without affecting such relationships. However, it is requested that you notify the investigator of this.

If you have any questions, please contact Carolyn Kenney (ckennedy6@bryant.edu) or Dr. Kristin Scaplen (kscaplen@bryant.edu). If you have any additional questions later, I will be happy to answer them. I can also provide a copy of this form if you wish to keep it.

Please check yes, if you agree to the following conditions above and if you have decided to participate. Your selection of yes indicates only that you are at least 18 years of age and have read the information provided above. Your selection to yes does not obligate you to participate, and you may withdraw from the study at any time without consequences.

- Yes, I consent
- No, I do not consent

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

What is your age?

- Under 18
- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 - 74
- 75 - 84
- 85 or older

What is your gender?

- Male
- Female
- Non-binary
- Prefer not to say
- Other

Which of the following best describes your race/ethnicity?

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other

How long have you been practicing tai chi? (years + months)

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

How often do you practice tai chi each week?

- Never
- Once a week
- 2-3 times a week
- 4-6 times a week
- Daily

What style of tai chi have you practiced the most?

- Chen Style
- Yang Style
- Wu Style
- Sun Style
- Hao Style
- I'm not sure

Have you ever been diagnosed with an anxiety disorder?

- No
- Yes

If you have previously been diagnosed with an anxiety disorder, were you diagnosed before or after you started practicing tai chi?

- Before practicing tai chi
- After practicing tai chi
- I have not been diagnosed with an anxiety disorder

If you have previously been diagnosed with an anxiety disorder, were you prescribed medication to treat your anxiety?

- Yes

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

- No
- I have not been diagnosed with an anxiety disorder

Do you continue to take anxiety medication while practicing tai chi.

- Yes
- No
- I have not been prescribed medication to treat anxiety

How would you rate your overall physical health?

- Poor
- Fair
- Good
- Excellent

How would you rate your overall mental health?

- Poor
- Fair
- Good
- Excellent

How many times in the last 12 months have you been to the doctor's office or received care?

Are you enrolled in Medicare?

- No
- Yes

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?

Honors Thesis for Carolyn Kenney

How much on average do you spend through Medicare per month?

Over the past two weeks, how often have you been bothered by the following problems?

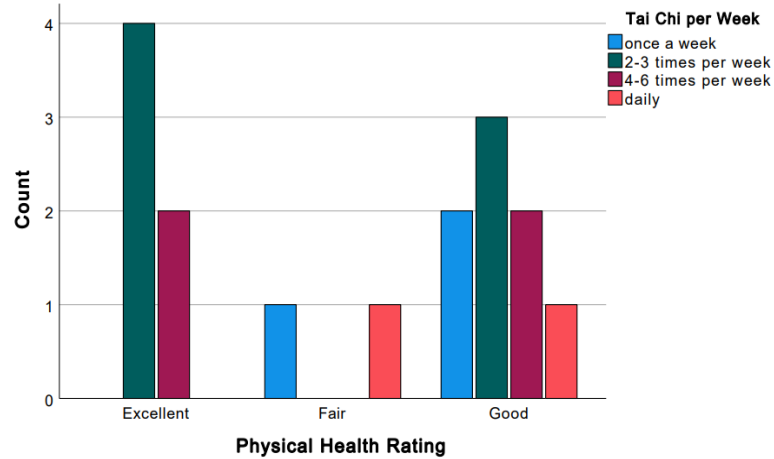
	Not at all	Several Days	More than half the days	Nearly every day
Feeling nervous, anxious or on edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Survey Powered By Qualtrics

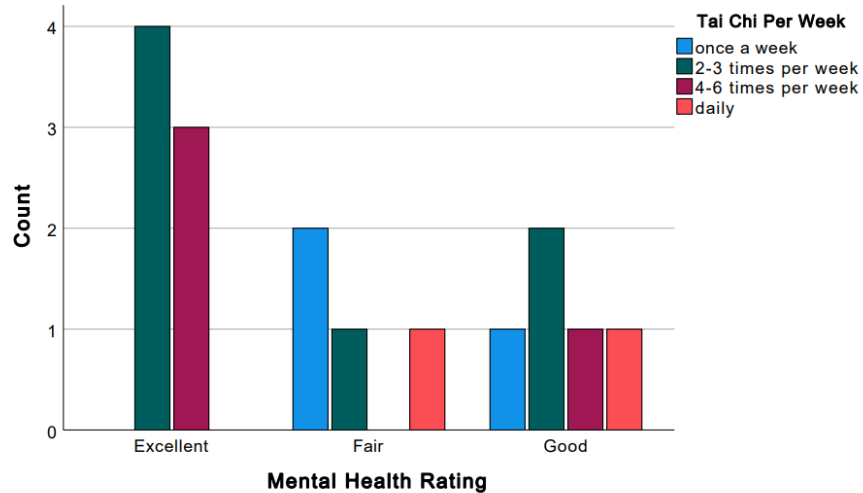
Appendix A – Survey Questions

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

Appendix B – (Length Practicing Tai Chi vs Physical and Mental Health Ratings)



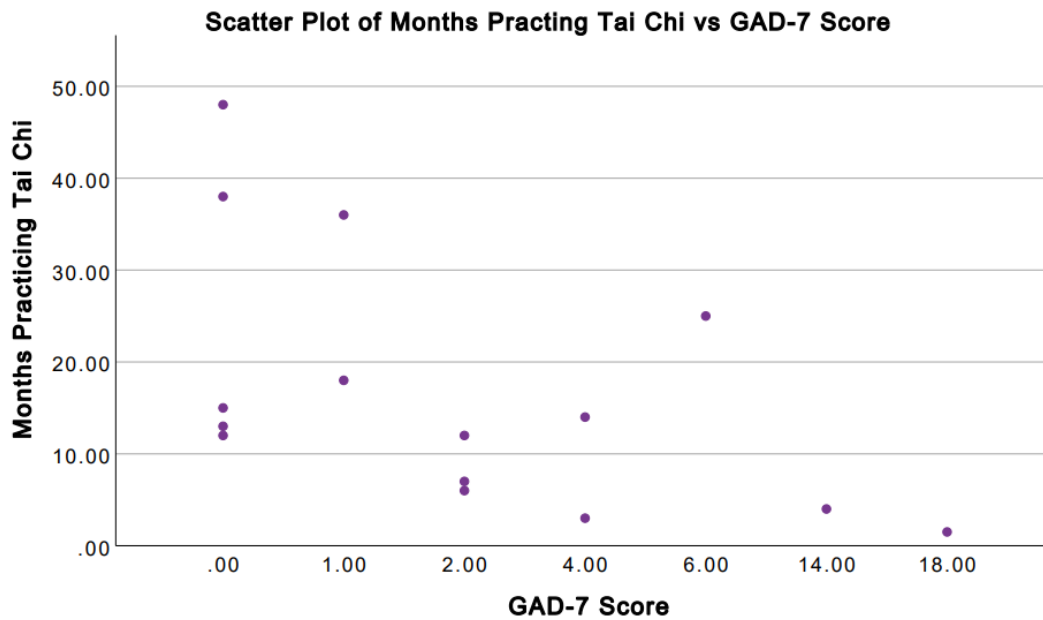
Appendix B₁ – Length of Practicing Tai Chi vs Physical Health Ratings



Appendix B₂ – Length of Practicing Tai Chi vs Mental Health Ratings

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

Appendix C- (Length of Practicing Tai Chi vs GAD-7 Score)



Appendix C – Length of Practicing Tai Chi vs GAD-7 Scores

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

REFERENCES

“Anxiety Disorders.” *National Institute of Mental Health*, U.S. Department of Health and Human Services, 2022, <https://www.nimh.nih.gov/health/topics/anxiety-disorders>.

“Diagnostic and Statistical Manual of Mental Disorders.” *DSM Library*,
<https://dsm.psychiatryonline.org/doi/book/10.1176/appi.books.9780890425596>.

“Global Health Estimates: Life Expectancy and Leading Causes of Death and Disability.”
World Health Organization, World Health Organization, 2021,
<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>.

Anderson, Elizabeth H, and Geetha Shivakumar. “Effects of Exercise and Physical Activity on Anxiety.” *Frontiers*, Frontiers, 1 Jan. 2013,
<https://www.frontiersin.org/articles/10.3389/fpsy.2013.00027/full>.

Balsamo, Michela, et al. “Assessment of Anxiety in Older Adults: A Review of Self-Report Measures.” *Clinical Interventions in Aging*, Dove Medical Press, 6 Apr. 2018,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5896683/>.

Bao, X., & Jin, K. (2015). The beneficial effect of Tai Chi on self-concept in adolescents. *International Journal of Psychology: Journal International de*

Blumenthal, David, et al. “Medicare at 50 - Moving Forward: Nejm.” *New England Journal of Medicine*, 29 Jan. 2015, <https://www.nejm.org/doi/full/10.1056/NEJMp1414856>.

Creighton, Alexandra S, et al. “The Prevalence, Reporting, and Treatment of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities.” *ClinicalKey*, 2018, <https://www.clinicalkey.com#!/content/playContent/1-s2.0-S0165032717308650?returnurl=null&referrer=null>.

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

- Crocq, Marc-Antoine. "The History of Generalized Anxiety Disorder as a Diagnostic Category." *Dialogues in Clinical Neuroscience*, Les Laboratoires Servier, June 2017, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5573555/>.
- Guo, Yucheng, et al. "Tai Ji Quan: An Overview of Its History, Health Benefits, and Cultural Value." *Journal of Sport and Health Science*, Elsevier, 30 Dec. 2013, <https://www.sciencedirect.com/science/article/pii/S2095254613000999>.
- Hofmann, Stefan G, and Angelina F Gómez. "Mindfulness-Based Interventions for Anxiety and Depression." *The Psychiatric Clinics of North America*, U.S. National Library of Medicine, Dec. 2017, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5679245/>.
- Kandola, Aaron, et al. "Moving to Beat Anxiety: Epidemiology and Therapeutic Issues with Physical Activity for Anxiety - Current Psychiatry Reports." *SpringerLink*, Springer US, 24 July 2018, <https://link.springer.com/article/10.1007/s11920-018-0923-x>.
- Loerinc, Amanda G., et al. "Response Rates for CBT for Anxiety Disorders: Need for Standardized Criteria." *Clinical Psychology Review*, Pergamon, 14 Aug. 2015, <https://www.sciencedirect.com/science/article/pii/S0272735815001178>.
- Manchikanti, Laxmaiah, et al. "Evolution of US Health Care Reform." *Evolution of US Health Care Reform*, U.S. National Library of Medicine, 2017, <https://pubmed.ncbi.nlm.nih.gov/28339426/>.
- Officer, Alana, et al. "Ageism, Healthy Life Expectancy and Population Ageing: How Are They Related?" *International Journal of Environmental Research and Public Health*, MDPI, 1 May 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7246680/>.
- Park, Junchol, and Bitu Moghaddam. "Impact of Anxiety on Prefrontal Cortex Encoding of Cognitive Flexibility." *Neuroscience*, U.S. National Library of Medicine, 14 Mar. 2017, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5159328/>.

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

Roberts, Andrew W, et al. "The Population 65 Years and Older in the United States: 2016."

The Population 65 Years and Older in the United States: 2016, 2018,

<https://usatrade.census.gov/content/dam/Census/library/publications/2018/acs/ACS-38.pdf>.

Sharma, M., & Haider, T. (2015). Tai chi as an alternative and complimentary therapy for anxiety: a systematic review. *Journal of Evidence-Based Complementary & Alternative Medicine*, 20(2), 143–153. <https://doi-org.bryant.idm.oclc.org/10.1177/2156587214561327>

Song, Q. H., Shen, G. Q., Xu, R. M., Zhang, Q. H., Ma, M., Guo, Y. H., Zhao, X. P., & Han, Y. B. (2014). Effect of Tai Chi exercise on the physical and mental health of the elder patients suffered from an anxiety disorder. *International journal of physiology, pathophysiology and pharmacology*, 6(1), 55–60.

Spitzer, Dr. Robert L. "Gad-7 (General Anxiety Disorder-7)." *MDCalc*, <https://www.mdcalc.com/gad-7-general-anxiety-disorder-7>.

Tong, Yingge, et al. "Effects of Tai Chi on Self-Efficacy: A Systematic Review." *Evidence-Based Complementary and Alternative Medicine*, Hindawi, 15 Aug. 2018, <https://www.hindawi.com/journals/ecam/2018/1701372/>.

Tricia Foll, and Juliette Cubanski. "The Facts on Medicare Spending and Financing." *KFF*, 20 Aug. 2019, <https://www.kff.org/medicare/issue-brief/the-facts-on-medicare-spending-and-financing/>.

Van Bodegom, Miranda, et al. "Modulation of the Hypothalamic-Pituitary-Adrenal Axis by Early Life Stress Exposure." *Frontiers*, Frontiers, 1 Jan. 1AD, <https://www.frontiersin.org/articles/10.3389/fncel.2017.00087/full>.

Vespa, Jonathan. "The U.S. Joins Other Countries with Large Aging Populations." *Census.gov*, 9 Oct. 2018, <https://www.census.gov/library/stories/2018/03/graying-america.html>.

Is Tai Chi Beneficial Treatment for Anxiety in the Elderly Community?
Honors Thesis for Carolyn Kenney

Whiteford, Harvey A, et al. *Global Burden of Disease Attributable to Mental and Substance Use Disorders: Findings from the Global Burden of Disease Study 2010*, 2013,
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(13\)61611-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)61611-6/fulltext).

Wielgosz, J., Goldberg, S. B., Kral, T., Dunne, J. D., & Davidson, R. J. (2019). Mindfulness Meditation and Psychopathology. *Annual review of clinical psychology*, 15, 285–316.
<https://doi.org/10.1146/annurev-clinpsy-021815-093423>

Yucheng Guo, Pixiang Qiu, and Taoguang Liu, et al. “Tai Ji Quan: An Overview of Its History, Health Benefits, and Cultural Value.” *Journal of Sport and Health Science*, Elsevier, 30 Dec. 2013,
reader.elsevier.com/reader/sd/pii/S2095254613000999?token=2E6587175210D74052925B971E213AAB3591EEEDD53392DC271571F3228549C7E5C9482A89BCDFF7868D62C72CA16D87.