

THE POWER OF DANCE: A LOOK AT THE PUBLIC'S AWARENESS OF
PHYSIOLOGICAL BENEFITS & THE INFLUENCE OF CULTURE AND
GENDER

By

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ABSTRACT

Throughout the years, using dance as a creative outlet has improved various types of health including physiological, mental, social, and behavioral health. However, in my personal experience and that of others, I have noticed disparities in the awareness of these health benefits and in dance participation due to multiple factors, including culture and gender. To further explore this, a survey and interviews were used to collect information regarding participants' experience with dance, how it relates to culture, as well as their perspectives about its effect on health. The results showed that a majority of participants chose to become involved in dance out of personal interest and believed that dance had a greater effect on mental health, although it did affect physiological, social, and behavioral health as well. Regarding the influence of culture and gender, those who indicated participating in cultural dance did so as a way to feel more connected with their culture or heritage. Ultimately, respondents from both the survey and the interviews shared the common view that most dance classes/performances consisted primarily of females, with little to none male participation, emphasizing the need for increased awareness of the benefits of dance and more diverse representation in dance participation.

INTRODUCTION

Growing up as an Indian-American, I never felt as if I truly belonged in one place. I was too Indian for my predominantly American classmates and too Americanized for my fellow Indians; I learned English in school but spoke Marathi at home. It wasn't until I started dancing that I felt as if I could combine both aspects of my life into one personality. I have been dancing now for 15 years and in that time, I have not only experienced the amount of health benefits that dance offers but I have been introduced to social, behavioral, and mental benefits of the practice. I have learned how to be confident in myself, how to interact with other people, and how to use dance as a health and wellness outlet. As I grew throughout my dance experience, I wanted to do more than just perform; I wanted to share with others the impact of dance. So, I started my own dance class at the age of 12 and today, I have grown it to encompass over 16 students. I have watched them form friendships, cry out from landing on the wrong ankle after a jump, and yell out in surprise after they master their splits for the first time. I have observed them grow up and become more comfortable in their bodies; for reference, I have included a picture of two of my oldest students before a cultural dance performance (see Figure 1).

One of the biggest challenges that I experienced as both a student and a teacher was attempting to increase the diversity of my dance class, particularly with respect to gender. Even when I was a student, my class was always filled with other girls but never any boys who were interested in taking up dance. Dances that required a male lead were always performed by a female in costume, introducing me to the idea of the lack of equal gender representation in dance. When I became a dance teacher, I asked various family friends and community members if any boys wanted to join my class but I was always turned down. Parents scorned at my request, asking why their son would ever want to dance on stage in front of an audience as it was

a seemingly “girly” concept. Thus, I chose to explore the public’s awareness of the health effects of dance and how participation can be influenced by culture and gender.

Figure 1:



BACKGROUND

Physiological Effects of Dance

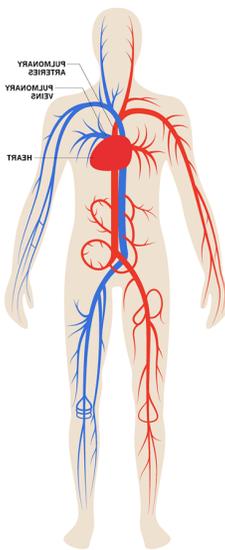
Physical inactivity has long since been a challenge to overcome globally, leading to negative health effects such as cardiovascular & metabolic diseases, osteoporosis, weight gain, and loss of physical function (to name a few), especially for persons of advanced age. However, research has consistently shown that dance can be used as a form of exercise, in varying levels of intensity, to overcome this challenge (Yan et al., 2017). In addition to physiological effects, there is also substantial literature demonstrating the effect of dance on mental, societal, and behavioral health. Dance therapy has been used as a form of treatment since the days of ancient Greeks, as evidenced by Plato's work describing song and dance as a method of catharsis to avoid depressive thoughts (Schott-Billman, 2014). It has continued to evolve into different forms of expression, integrating itself into cultures and traditions, and becoming a way of life. Dance has been shown to improve psychological status, quality of life, satisfaction, confidence, and more. It has widely been cited as an enjoyable and alternative method of improving health quality, self-image and physical control (Sivvas et al., 2015). There are multiple physiological systems within the body that can be affected by participating in dance as a form of exercise; in my thesis, I will focus on integrating these into the following four categories: cardiovascular health, metabolic health, mental & neurological health, and social & behavioral health.

Cardiovascular Health

The cardiovascular system consists of the heart that pumps blood through a system of vessels including arteries, veins, and capillaries (see Figure 2). The system serves to transport nutrients and oxygen to tissues as well as remove waste (such as carbon dioxide) from the body.

With an ultimate goal of maintaining homeostasis within the body, nutrient diffusion is absolutely vital. A multitude of capillaries are used to increase the surface area to volume ratio which are then used for the diffusion of nutrients from blood into extracellular fluid and the uptake of waste products back into the blood. The cardiovascular system responds to bodily demand by increasing cardiac output, increased contractility, and increased blood flow. Improving blood flow within the tissues and peripherals allows for greater energy activation.

Figure 2: Anatomy of the Cardiovascular System



The actions of the cardiovascular system are under the control of various feedback mechanisms as well as executive nervous input. While the electrical conductivity of the heart is dependent upon the sinoatrial node (SA node) within the right atrium of the heart, the rate and force of contractions may be affected via the parasympathetic and sympathetic branches of the autonomic nervous system. Furthermore, specific chemical and hormonal changes within the body can further affect heart rate, leading to either bradycardia (slowing) or tachycardia (speeding). Therefore, it is important to maintain the viability of the cardiovascular system, and exercise provides an effective venue to help with this. Exercise serves as a stimulus in the

peripheral vessels of the body to increase blood flow. This involves chemical changes that lead to both an overall dilation of arterioles as well as a local dilation that ultimately serve to increase blood flow. Aerobic activity can work to strengthen the heart & blood vessels, improve blood flow, reduce blood pressure and cholesterol, and increase cardiac output, all of which lead to reduced risks of cardiovascular complications in the future.

One of the most commonly acknowledged physiological benefits of dance is its effect on cardiovascular disease, especially for aging adults. Due to its ability to attract various audiences from different age groups and differing physical ability, dance has become a simple way to maintain exercise capacity and improve sedentary habits. In particular, dance can be used as a way to improve cardiorespiratory fitness, which has been used as an indicator to predict risk of mortality and risk of cardiovascular disease (Kodama et al., 2009). Dance can also serve to improve peak oxygen consumption via VO_2 rates (another measure of cardiorespiratory fitness) of elderly adults, compared to those without moderate exercise (Rodrigues-Krause, 2016). By adapting to various metabolic and functional demands of aging, using dance as a form of physical activity can help to delay muscle fatigue and improve overall fitness. Furthermore, in another meta-review conducted by researchers at the University of Sydney, dance intervention had a greater effect on outcomes related to Body Mass Index (BMI), total fat mass, triglyceride levels, compared to structured exercise programs (Yan et al., 2017). Since cardiovascular disease is the leading cause of death in the United States, incorporating regular exercise into a daily routine can help to reduce risk factors. While it is important to note that various aspects of dance therapy can affect cardiorespiratory fitness, such as type of dance, duration, and level of intensity, it is due to this broad range of intensity and types that dance is particularly adaptable to meet the needs of people of varying age and fitness.

Metabolic Health

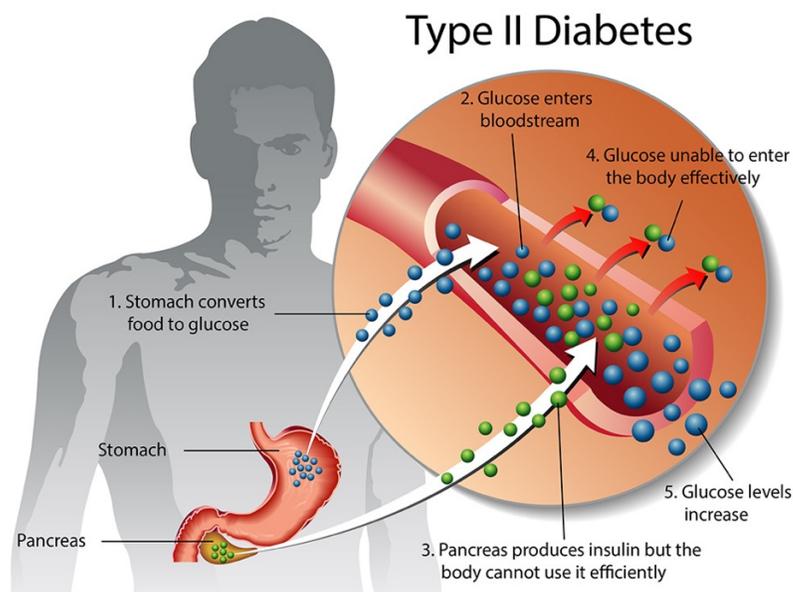
Metabolism is a general term used to describe the processing of essential molecules such as proteins, fats, sugars, hormones, and more to maintain homeostasis within the body. Thus, nutrition and diet are incredibly important to maintain metabolic health. Nutrients obtained through one's diet work to support the consistent anabolic and catabolic pathways of the body. Carbohydrates, stored as starch, fiber, and sugar, are used as energy sources. In particular, glucose is broken down to obtain high-energy molecules, such as adenosine tri-phosphate (ATP), that are used for cellular activities. Proteins are used for a variety of cell functions including transport, structure, and enzymatic reactions. Fats also serve as a reservoir of energy (and provide more energy than carbohydrates or proteins) as well as contribute to cellular membranes, are basic components of some hormones, and serve as important forms of insulation around organs. Because the body needs to maintain a functional balance (i.e. homeostasis), levels of essential molecules are tightly regulated at both the cellular and systems levels. Inputs from the nervous system and endocrine system work via a variety of mechanistic pathways and negative feedback to ensure that the body's metabolic rate is staying within its normal limits.

Regular exercise can help to increase muscle mass, burn fat, and improve calorie loss, all to help bring the body into homeostasis. An incredibly common condition affecting global residents, especially in America, is the increasing prevalence of obesity: in fact, about 39.8% of adults over 20 years old in the US were classified as obese in 2016 (CDC). Although there are many factors that can contribute to obesity, such as genetic predispositions, malnutrition, and insulin resistance, lack of exercise is a major contributor. With varying levels of intensity, dance can help to increase weight loss and improve overall metabolic health. For example, a review by Lesser et al. (2016) mentioned the combination of three dance-related interventions that

improved BMI, body weight, and body-fat percentages as well as lean mass in different areas of the body. Bhangra dance in particular, was able to reduce visceral fat in older women but not affect insulin resistance. When combined with Korean dance, however, insulin resistance was improved over time, suggesting that an intervention of dances with various emphases on body areas can work to improve metabolic fitness.

The presence of obesity can further metabolic complications, including Type II Diabetes. Type II diabetes is a chronic medical condition wherein the body does not properly respond to the hormone insulin which is used to remove glucose from the blood into tissues where it is utilized for energy (see Figure 3). Thus, the resistance to insulin leads to increased blood glucose, which can in turn damage blood vessels and increase risk factors for conditions such as heart disease and cerebrovascular accidents.

Figure 3: Mechanism of Type II Diabetes



According to the American Diabetes Association (ADA), about 34.2 million Americans had diabetes in 2018, with about 95% of those cases being of Type II Diabetes. One study

showed how performing aerobic exercises such as Zumba dance in overweight/obese or Type II diabetic women, health outcomes were improved; specifically, heart rate, body weight, BMI, and body fat percentages were lowered (Krishnan et al., 2015). Furthermore, at the end of the dance intervention (after 15 weeks), blood glucose was significantly lower after class than before, emphasizing that exercise likely played a role in improving blood glucose levels. Particularly, exercise can work at the cellular level to increase the magnitude of skeletal muscle glucose uptake. In skeletal muscle, two primary methods of uptake are used: insulin-stimulated and contraction-stimulated. However, since Type II diabetic patients are unable to adequately respond to insulin, contraction-stimulated uptake prevails. Muscle contraction allows for the translocation of the GLUT4 transporter isoform from intracellular vesicles to the plasma membrane and T-tubules of muscle cells (Messina et al., 2015). This then allows for increased glucose uptake into skeletal muscle where it is then stored as glycogen, with the additional effect of reducing overall blood glucose levels. Thus, by increasing education about the importance of regular exercise, the incidence of the disease can be lowered.

Mental and Neurological Health

Dance is unique in that it combines exercise, music, and cognitive function to engage the mind and the body into a creative collaboration. It has often been studied for its therapeutic use by incorporating visual, auditory, and sensory cues to increase blood flow to the brain and strengthen neural networks (see Figure 4). By utilizing motor pathways, it can also serve to activate higher orders of the brain including the motor cortices and somatosensory cortices (Deiber et al., 1999).

Figure 4: Neural effects of Dance



However, beyond its use in improving neural connectivity, dance has played a role in improving numerous mental and neurological health issues as well. For example, Parkinson's disease is a neurodegenerative disease wherein dopaminergic neurons in the basal ganglia are lost. Symptoms of Parkinson's include muscle tremors, speech difficulty, slowed movement, impaired posture & balance, and more (Lossing et al., 2016). Since dance works to incorporate multiple systems together, it has been shown to improve functional mobility, gait, balance, and posture. An article by Dr. Earhart (2009) suggests that dance can work to activate specific areas that may otherwise have reduced activation and utilization in Parkinson's disease. Alternatively, the auditory, visual, or somatosensory cues mentioned above can bypass the basal ganglia and use different pathways of activation. Thus, by using dance as a therapeutic intervention, individuals affected by Parkinson's disease may be able to see some improvement in motor functionality.

Dance can also be beneficial for patients affected by mental disorders, such as depression. The DSM-5 criteria for being diagnosed with depression, also known as major

depressive disorder (MDD) or clinical depression, include markedly diminished interest or pleasure in activities, significant weight changes, fatigue or loss of energy, reduction of physical movement, thoughts of death or suicide, and more. In the United States, MDD affects about 6.7% of the population aged 18 years and older (Anxiety and Depression Association of America). As dance has been shown to improve self-image, self-worth, and overall feelings of happiness, it has been studied in its use as a therapeutic measure to improve mental health in those affected by depression. In one study conducted by Koch et al (2007) in Germany, patients were separated into three groups: one that performed a traditional energetic dance, one group that simply listened to the music, and a third group that exercised on a home trainer bike. The study showed that the participants in the dance group showed lower scores of depression, as determined by the Heidelberg State Inventory test. Furthermore, participants reported increases in feelings of vitality, or higher energy. Thus, dance was able to impact participants mentally as well as socially, emphasizing the versatility of the art of dance.

Social and Behavioral Health

While physical health is important for body homeostasis, social and behavioral health is just as important for emotional health. As a person grows throughout life, the relationships that they make can have lasting impacts on their lives. Obesity, complications in physical health, and low self-esteem are only a few examples of personal aspects that can lead someone to pursue a sedentary lifestyle. By encouraging social interaction via exercise therapy (such as dance rehabilitation), people within all age groups can improve their quality of life. In particular, dance can be used a social activity that encourages connecting with one's identity, whether it be cultural or communal. Furthermore, it can be used to lower rates of loneliness and depression

and improve coping mechanisms and self-esteem (Clifford et al., 2019). In another randomized controlled trial measuring how patient education & dance therapy play a role in quality of life and functional capacities, dance intervention helped increase participants' self-esteem. Furthermore, participants danced more "freely", possibly due to increased social interaction amongst the group and an increased sense of belonging (Allet et al, 2017).

By improving interpersonal relations and encouraging positive relationships amongst others, dance can serve to build a sense of security in one's lives, especially amongst those who may have been subjected to prior trauma or abuse. A study conducted in China explored how dance/movement therapy affected relationships among those who had suffered from sexual abuse in their childhood. While quantitative data was limited, qualitative analysis suggested that the participants experienced an increased awareness of their own bodies, emotions, feelings, and relationships (Ho, 2015). This suggests that by slowly incorporating social interaction and increasing perception of one's own space, people can feel a sense of security by being in the company of those who accept them. This sense of acceptance can work to improve their mental health and subsequently their physical health. Dance can allow someone to become more immersed into their own emotions and inner thought, serving as an uplifting and freeing experience.

Impact of Gender and Culture on Dance Participation

The ability of dance to serve as an artistic form of expression has enabled it to be used in a variety of cultures through rituals, traditions, and more. Furthermore, dance has been able to integrate various cultures into a "fusion," thus helping to enhance the richness of a culture. Personally, I used dance as a way to become more integrated within my own culture, so that I

could feel more connected with my roots, even while living in a different country. This is a similar experience for many of those with foreign roots. For example, in a 2017 newspaper article “Korean youth connect to culture heritage through music and dance,” many Korean-American teens spoke about how participating in Korean cultural dance helped them spread their culture and demonstrate their Korean identity (Wright).

However, while various cultures may use dance styles differently, a common occurrence is the gender disparity in dance participation. In Western theatrical dance such as ballet, females have been long considered to dominate the field. In fact, in the 1840s, male dancers were removed from ballet groups and females played their subsequent roles (Stinson, 2005). The concept of dance has been feminized and therefore, dance culture has adopted the premise of gender exclusivity. In another example, Gilman writes in her book “The Dance of Politics: Gender, Performance, and Democratization in Malawi” during political rallies in Malawi, women adorned with a respective party’s colors and clothing danced in concentric circles around the beat of two men playing the drums (2009). Various styles and types of dances have perpetuated an idealized fantasy of women but yet have seemingly excluded men. The creativity of dance requires intellect, dedication, perseverance, and athleticism but yet only in a specific form. In my personal experience, young boys are veered away from dance as a creative exercise in fear of society labeling them as “not man enough.” In Gard’s article, it is mentioned how school sports and physical education are used to reinforce male strength and aggression, thus deeming females as physically inferior (2001). In a later article, Li talks about how peer pressure drove adolescent boys to refer to their dancing as “hip-hop” so they would fit in amongst the crowd (2011). These examples serve to perpetuate a stereotype within the community that boys should be discouraged against seeking dance out as a form of exercise, even after research has

shown the health benefits of participation. Thus, I chose to focus my research on how culture & gender can affect people's opinions on dance as a form of exercise.

METHODS

My thesis project had a two-fold purpose: the first was to evaluate how members of the community viewed the various health benefits of dance including physiological, mental, social, and behavioral health. The second purpose was to determine how community factors such as culture and gender played a role in influencing people to participate in dance. The main audience that I was hoping to target consisted of college students, regardless of if they had had prior dance experience. I developed a survey, which, after approval from the UA Institutional Review Board, was sent out to various classes at the University of Arizona through the Physiology department. Survey questions were designed to understand participant's background including their year and major in college, any prior dance experience/the setting of the experiences, whether they had seen any form of gender identity issues or misrepresentation within their dance experience, and any health benefits that they believed dance contributed to.

15 questions were asked (see Appendix A for specific questions) and participants consented to continuing with the survey. The surveys were active within the student community for a total of 9 days, from April 29th, 2020 to May 7th, 2020. Questions asked in the survey were aimed at understanding different aspects of student's backgrounds, including demographics (year in school, major, and gender), experience with dance (duration of dance experience, type of dance, reason for participating, and type of venue), perspectives on health benefits, and the effect of culture and gender (if applicable, to what extent culture has played a role and whether any gender disparities were present).

While the survey provided specific information in terms of how students within the UA community had been involved with dance, I also consulted with specialists in the area regarding dance trends, preparation, history, and how useful dance can be as a form of exercise. Specifically, I was interested in what qualities serve to make dance a form of professional exercise and how that may differ from “more traditional” sports. Additionally, I was interested in understanding how participation in dance has evolved. Therefore, I spoke with the UA athletic trainer for the dance department, Kristin Miller. Our interview lasted about 20 minutes over the phone and was designed so that I could further understand her perspective on dance as a form of health exercise and the physiology behind how dance can improve health.

Questions that I asked Kristin were centered around three categories. In the first category, my goal was to understand her role in the dance community such as her own personal experience and what kinds of dance injuries she has seen in her career. The second category were questions focused on her opinion on dance as a form of exercise, such as how dance differs from other forms of exercise and what health benefits that she has observed. The third category of questions were aimed at understanding whether she had experienced any variations in gender participation and what efforts have been made to mitigate that. Specific questions from the interview are listed in Appendix B.

Since my research purpose is also focused on evaluating the influence that gender and culture can play on dance participation, I spoke to the parents of two of my own students about how dance had played a role in their children’s lives. I was interested in gaining an anecdotal view of their personal motivation to continue dancing for an extended period of time. Both conversations lasted about 10 minutes over the phone. The questions that I asked the parents included:

1. Why did your child start becoming involved with cultural dance?
2. What changes (emotional, physical, mental) did you see within your child after they started dancing?
3. In your opinion, what makes dance different from other forms of exercise?
4. Have you noticed any gender identity issue in your experience with cultural dance? If so, what was it?

RESULTS

Survey:

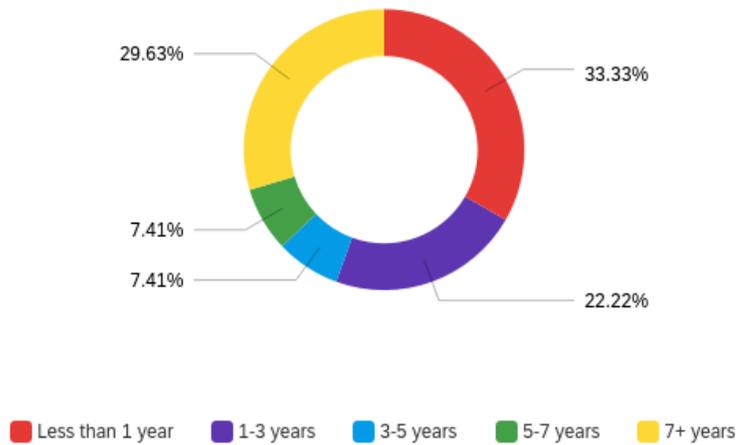
Within the 9 days that the survey was open for data collection, I received a total of 38 individuals who consented to participate in my research. However, since participants were free to choose not to answer a specific question, the total number of responses per question did not always equal 38.

Regarding the demographics of the population, of the 33 responses, the majority of participants (21) were seniors in college, while 7 were juniors, 3 were sophomores, and 2 were freshmen. The most common major reported was Physiology (29/34), while Molecular & Cellular Biology had one participant, Public Health had two, and Psychology and College of Medicine each had one as well. The most common gender chosen was female with 23/34 participants, while the remaining 11/34 participants identified as male.

With respect to dance experience, the majority of participants had had prior dance experience (22/34). However, the length of time of dance participation varied between individuals (see Figure 5). The majority of participants had been dancing for less than one year

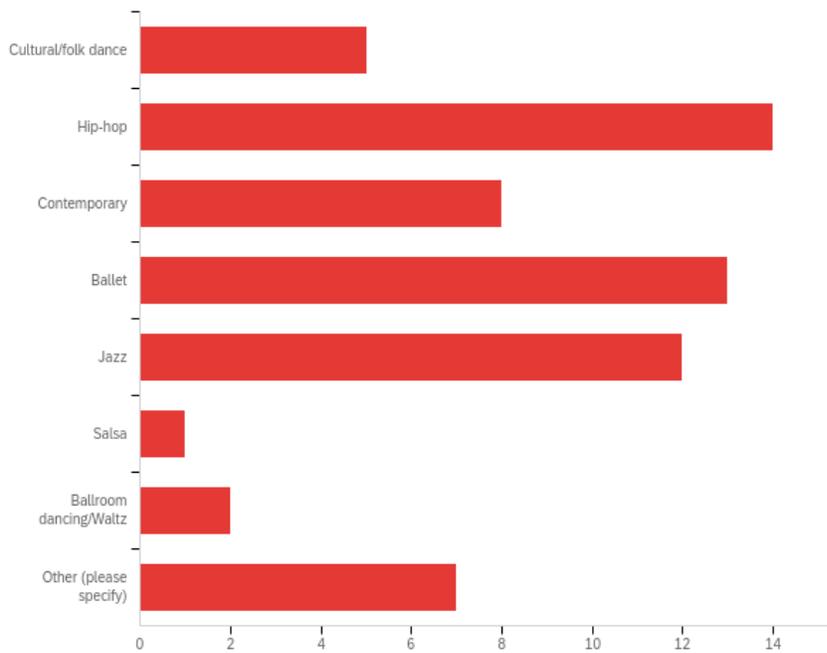
(33.3%), but a significant number also had over 7 years of experience (29.6%). The rest of the participants were interspersed amongst the middle options (1-3 years, 3-5 years, and 5-7 years).

Figure 5: Length of Time of Dance Participation



In response to what type of dance was performed, the most common answer was hip-hop with 14 participants. The next common types of dance were ballet with 13 participants and jazz with 12 participants (see Figure 6 for a full list of options). Note: since the question was a ‘select all that apply’, answer totals exceed the number of respondents.

Figure 6: Types of Dance Performed



The other options of dance included K-pop, pointe, tap, pom, country, lyrical, modern, funk styles, and Afrikana.

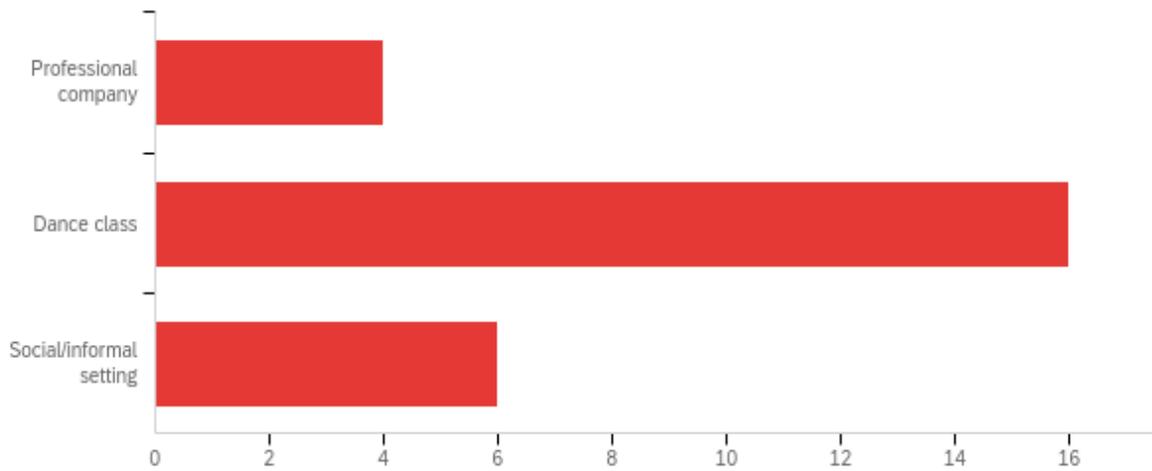
Considering the culture-related questions, the majority of respondents indicated that they did not participate in cultural activities (21/33), while 12 respondents said that they did. When asked specifically about which cultures, some participants gave singular cultures such as **“Greek”** or **“Indian”** or **“Ramadan/Eid”** while others gave a combination of answers such as **“Jewish, Italian, Indian, and Spanish”** or **“Korean and Nigerian.”** Overall, there was considerable diversity among the responses.

The responses to what role culture played in the participant’s dance experience were once again varied. One common theme that was presented was the feeling of connectedness. For example, one participant stated that it **“gave them purpose”** while another participant believed that **“it provides a keen sense of identity and belonging.”** One participant in particular

mentioned that it has allowed them to *“show people what they have skills in.”* This participant further commented that it gave them *“discipline, confidence, work ethic, and knowledge.”*

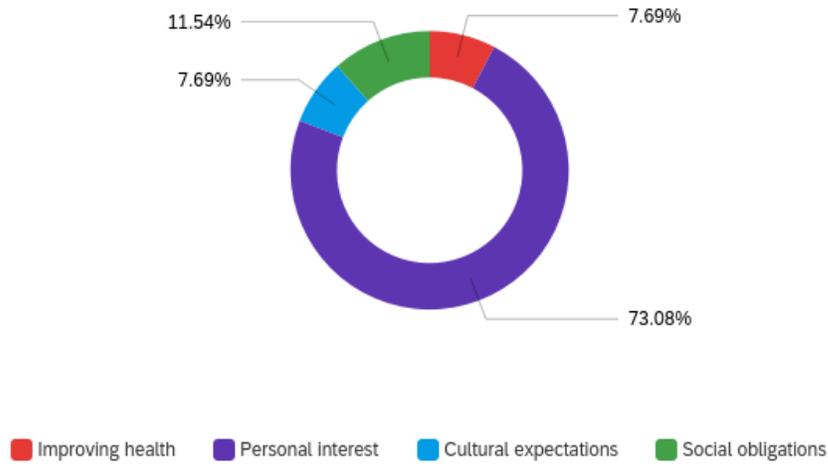
With respect to the venue of the dance class and participant’s motivations for pursuing dance, the most common venue that participants had danced in was a dance class (16/26 responses). The distribution between the other two options, professional company and social/informal setting, is shown below in Figure 7.

Figure 7: Types of Dance Venues



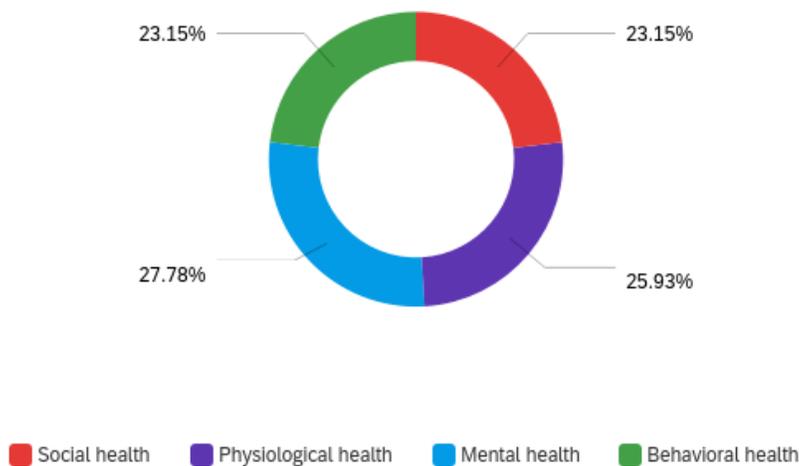
When asked about a participant’s motivations behind participating in dance, a large majority of respondents selected personal interest (19/26). Two participants chose “Improving Health,” 2 chose “Cultural expectations,” and 3 chose “Social obligations.” The breakdown of participants is depicted below in Figure 8.

Figure 8: Personal Motivations for Participating in Dance



When asked about the effects that participants believed dance had on health, if any, there were relatively uniform results between the four options of social health, physiological health, mental health, and behavioral health. Since the question had a “select all” format, participants were able to select any or all of the options to create a more comprehensive analysis. The distribution between the four options is shown below in Figure 9.

Figure 9: Effects of Dance of Health Types



The last classification of survey questions focused on the effects of gender on dance participation. When asked if a perceived gender identity issue was present in their dance class, 9/30 participants said there was, while 21/30 participants stated that there was not. For those participants who stated yes, when asked to elaborate, the common theme was that there were mostly girls in their classes. In particular, one participant commented that ***“society tends to associate dancing...with women.”*** Another participant wrote that there were ***“never more than 1 or 2 boys in class...the guys...were always assumed to be gay.”*** However, one participant expressed that the trend was dependent on the style of dance. They wrote that for ballet, ***“there was a very high percentage of women compared to men”*** but ***“if one looks at popping or locking, it was more common for men to take that class.”***

When specifically asked whether the class was predominantly one gender or another, 22/29 participants said that it was, while 7/29 stated that it was not. When asked to elaborate, similar to the previous question, the common theme was that their class had been mainly female.

Answers for the final question about why this particular representation stood out in their memory were varied, ranging from someone’s personal introduction for dance to how gender was represented in their class. However, once again the common theme relayed was that it was easier for women to fit into dance classes as they were the majority. In particular, respondents commented that it was ***“easy to spot out when a guy wasn’t in the class because he didn’t look the same as everyone else.”*** Another participant wrote about how certain sports may have gender majorities; they mentioned that ***“football is typically men and to a lesser degree so is basketball...dance can be more emotionally expressive...being vulnerable with emotions is associated with women.”*** One participant commented about how, as a male, he saw ***“double standards for women in dance...women have to be good at being feminine and being rough***

with the men, but men didn't have to worry about being feminine." In general, most participants wrote about how dance was seen as feminine and therefore predominantly consisted of women, rarely men.

Interviews

Kristin Miller, UA Athletic Trainer

Having the opportunity to speak to the UA Athletic Trainer for the Department of Dance, Kristin Miller, allowed me to gain professional insight on how dance has changed throughout the years and how it can play a beneficial role in improving aspects of health. When asked about health benefits of dance that she had noticed in her years of practice, she spoke about *"the camaraderie of being in a group, whether it be through a class or a performing troupe."* She further mentioned the socialization aspect as a public health benefit. Additionally, she touched on the physiological ability of proprioception by commenting that the *"students in the School of Dance had a better sense of body awareness."* She went on to say that although it is dependent on the level of the athlete's involvement and amount of intensity, dance gives mental focus as one has to *"memorize combinations and patterns of vocabulary (choreography)."*

The third category of questions that she answered related to gender disparities in dance and how that has evolved through time. As a former ballet dancer, she spoke about how it was very women-focused in her time. She also notes that the role of the male was very different, that *"they were originally known for big jumps and their ability to do partnering;"* however, in recent times, there has been *"more choreography specifically for men and pieces for men that not only feature their ability to jump but just their ability to dance."* Ultimately, effort has been taken to improve the equality of men and women in dance.

Finally, when asked about whether people in general accept dance as a form of exercise, Miller comments that ***“those who get exposed to it recognize the athleticism behind dance, but in general, it probably isn’t as well respected.”*** She does mention how social acceptance has started to increase, specifically with performing arts medicine, which is a branch that serves occupational and physical medical needs of artists. Overall, dance has considerably changed throughout the years and has incorporated a variety of techniques.

Family Perspectives on the Role of Dance

I was also able to speak to the mothers of two of my students from my dance class. In conversation with them, I received similar answers as those within the survey. They stated that their children had chosen to become involved with Indian cultural dance mainly as a way to bridge the gap between their American and Indian cultures and thus ***“connect better with their heritage.”*** Beyond just a cultural connection, however, dance also uplifted students’ mood. They stated that the girls ***“always looked forward to dance practice because they were able to see their friends.”*** When asked how dance was different from other sports that their students participated in, they stated that dance required ***“more concentration and grace.”*** They also mentioned how dance was something that could be performed without any props or accessories. In regards to noticing any gender issues within cultural dance, they referred to how their childrens’ classes were predominantly female. This trend was common whether it was in a classical Indian dance class or in a Bollywood fusion dance class.

DISCUSSION

Synthesizing the responses from the survey, several connections between questions can be made. While the majority of survey respondents had participated in dance, duration of experience peaked at two opposite ends of the spectrum: less than 1 year or 7+ years of experience. This difference may show that the magnitude/duration of someone's participation in dance can alter their perspective on the various benefits of dance. For example, if someone has danced for a longer amount of time, the specific type of health benefit could have manifested in their lives in a more significant way compared to someone who may not have danced long enough to sense it. Another factor that can play a role in perception of health benefits is the type of dance that was performed. While hip-hop was the most common type of dance chosen, there was a significant range of responses given (i.e., ballet, jazz, cultural dance, etc) that could have highlighted different skills within individuals, ultimately altering which type of health might be affected.

Another connection can be made between the primary reason for participating in dance and the health benefits that were obtained. The most common motivation for joining dance was personal interest. While there were respondents who did choose cultural expectations or social obligations, the majority did so as their personal choice. This may correlate to the type of health that people believed dance most affected. While responses for social, physiological, mental, and behavioral health were relatively evenly chosen, mental health did slightly have more votes. This may signify that people choosing to participate in dance out of personal interest experienced greater feelings of satisfaction and improved moods. However, it is important to note that all four choices had significant responses, indicating that the majority of respondents valued the effect that dance can have on improving overall health. This was reinforced by my conversation with

Kristin. She mentions the camaraderie that a dance group can develop with each other, supporting the importance of socialization on personal health. Furthermore, in her experience of working with both students from the School of Dance as well as students coming to Campus Health for other injuries, she mentions how dancers had a greater awareness of their bodies, showing how bodily perception can be changed.

While analyzing the effects that culture played on dance, while the majority of participants reported not being involved in cultural activities, those who did mainly felt that it allowed them to feel more connected as well as provided them with a greater sense of identity and belonging to their heritage or culture. This is similar to what the mothers of the two girls from my dance class spoke about. For many children, including me, growing up with a variety of cultures, it can be difficult to find a place to “fit in.” So, for that reason, it was important to find a place where one could fit in and combine parts of their cultures together.

Based on the responses for the survey and the personal conversations, the common theme for gender representation was that dance was mainly targeted towards women, although it was noted that the specific type of dance was important. This is on par with the literature where the general consensus was that adolescent boys participating in dance was “frowned upon” by society. The negative stigma surrounding participation in dance can work to encourage stereotypes about gender identity. Although Kristin does mention an increase in inclusivity, there is still a long way to go before it is socially accepted. From my own personal experience and the information that I have gathered, I believe the assumption that dance is a feminine activity should be challenged at a young age. By encouraging boys and girls to actively participate in dance, alongside other sports, the importance of dance and its effect on health can become more prominent. Hopefully, engaging in preventative health earlier can reduce the risks of severe

physiological conditions later in life; dance is a perfect avenue to provide those benefits. To conclude, I've included a picture from one of my own Indian cultural dance performances below (see Figure 10).

Figure 10:



REFLECTION

While completing my honors thesis was absolutely more work than I had assumed it would be, I am incredibly grateful that I decided to continue with this path. I learned quite a few things during this process, but one of the main take home points for me was how much effort goes into the research process. Before a project is even approved, there are an infinite number of hoops to go through. For me personally, going through the IRB process was nerve-wracking but very worthwhile. I learned how important it is to be detailed in my work, especially when conducting research as it serves to ensure the safety and anonymity of participants. Even though editing my application multiple times was time-consuming, it allowed me to learn from my mentor and research professionals, ultimately leading to project approval.

Furthermore, I am grateful to have honed essential skills such as communication and time-management. I was able to gather my thoughts and deliver them in a form that I had not previously worked with: an online survey. I had to learn how to effectively communicate with my audience as well as ensure that all questions were fair and beneficial to furthering my work. I am also thankful that I had the support of such a fantastic mentor from the Physiology department, Dr. Rankin. Having the opportunity to build a close relationship and learn from her was truly an invaluable experience.

Moreover, my thesis allowed me to look at my own dance career with another perspective. Although I have been dancing for 16 years now, I never stopped to consider the influences that the outside world has on dance participation. While I noticed how trends manifested themselves in classes that I personally took or taught, I never fully took the time to analyze its implications. Conducting this research gave me the chance to look deeper into my own history and culture and be able to connect. Additionally, I was able to use the information

that I had learned as a Physiology major to look at dance as a form of exercise as well. Being able to apply concepts that I had learned in class to one of my favorite hobbies was an experience that I am truly grateful for. As I advance in my path of becoming a physician, I will always remember the impact that both physiology and dance had on me.

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APPENDIX A: SURVEY QUESTIONS

1. What year of school are you in?
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior

2. What College are you affiliated with at the University of Arizona? (If multiple majors, choose primary/first college you were involved with)
 - a. Physiology
 - b. Molecular & Cellular Biology
 - c. Dance
 - d. Nutrition
 - e. Business
 - f. Public Health
 - g. Humanities/Social Science
 - h. Other (please specify)

3. What gender do you identify with?
 - a. Male
 - b. Female
 - c. Transgender
 - d. Genderqueer/Nonbinary
 - e. Other (please specify)

4. Have you had any dance experience in your life?
 - a. Yes
 - b. No
5. If yes, please elaborate for how long
 - a. Less than 1 year
 - b. 1-3 years
 - c. 3-5 years
 - d. 5-7 years
 - e. 7+ years
6. What kind of dance did you do? (Check all that apply)
 - a. Cultural/folk dance
 - b. Hip-hop
 - c. Contemporary
 - d. Ballet
 - e. Jazz
 - f. Salsa
 - g. Ballroom dancing/waltz
 - h. Other (please specify)
7. Do you participate in culture-specific activities?
 - a. Yes
 - b. No
8. If yes, which cultures?
 - a. Free response

9. If yes, how has culture played a role in your dance experience?
 - a. Free response
10. What venue did you dance in?
 - a. Professional company
 - b. Dance class
 - c. Social/informal setting
11. What was your primary reason for participating in this dance class?
 - a. Improving health
 - b. Personal interest
 - c. Cultural expectations
 - d. Social obligations
12. Please check any effects that you believe dance has on health, if any, from the list below
 - a. Social health
 - b. Physiological health
 - c. Mental health
 - d. Behavioral health
13. Did you ever feel that there was a gender identity issue in your class (stereotypes, etc?)
 - a. Yes (if yes, please describe below)
 - b. No
14. In your opinion, was the class more predominately one gender or another?
 - a. Yes (if yes, please describe)
 - b. No
15. Why do you think this particular representation stood out in your memory?
 - a. Free response

APPENDIX B: KRISTIN MILLER INTERVIEW QUESTIONS

1. Can you tell me a little bit about how you got into dance? What is your specific role as an athletic trainer?
2. What are some of the most common dance injuries that you have seen?
3. What are some health benefits of dance that you have noticed in your years of practice?
 - a. Have you seen dance play a role in mental & behavioral health as well as physical health?
4. In your opinion, what makes dance unique from other styles of exercise?
5. In your experience with dancers, have you noticed any disparities in gender roles through dance? If so, how?
6. Do you believe that people in general accept dance as a viable form of exercise? Why or why not?