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Fit to Perform

Component 1

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This assignment will focus on discussing four separate components involved in dance. These being nutrition, fitness, anatomy and physiology, and psychology and the processes dance has with them. Included will also be details of how dance has a key role in mediating the effects of Parkinson's. My research for these components has come from four separate articles.

When carrying out research on nutrition I found an article which I found interesting and very factual. When exercise happens the heat production in the muscles and the regulation of body temperature is reliant on the evaporation of sweat from the skin. Perspiration occurs as part of normal bodily function to allow it to adapt to exercise and hydration. Water makes up 60% of the human body's weight. If a dancer becomes dehydrated it can cause cramps, nausea, lightheadedness and fainting which will then cause poor performance from the dancer. Therefore, fatigue and injury is common in dancers who are not sufficiently hydrated. If the body is dehydrated by 3% of body weight it can cause all of these symptoms. In opposition, a very well hydrated body will be able to produce a good amount of urine of a pale colour which will not have a strong odour, this would be the opposite for a dehydrated body.

To keep their muscles warm and malleable dancers prefer to be in warm environments in addition to wearing warm breathable clothing, this helps to prevent injuries such as strains, sprains and tears (Challis and Stevens, 2016, p.24).

However, this causes a higher amount of sweat to be produced which means that it is vital to make sure the dancer is taking in enough fluid to reduce the amount lost from this increased sweating. The amount of fluid lost by each individual massively varies, this variation is caused by differences in body size, body mass and genetic factors.

Electrolytes are minerals that the body needs to be able to regulate water balance, blood acidity and muscle function within the body. Electrolytes are vital for dancers to drink during intense exercise as you lose a lot of salt through sweating and this provides the body with more salt. Electrolyte intake can be increased by drinking electrolyte drinks. Electrolytes contain sodium, potassium, calcium and magnesium. The biggest source of sodium is added salt as in the diet there is a lot of salt in food today, not paying attention to the amount of salt being taken in can cause a salt imbalance and have an effect on how the body feels and looks but also on how well the dancer can perform.

While drinking a lot of caffeine can cause jitteriness, if it is consumed in moderation it can help enhance endurance and sport performance as caffeine is a stimulant.

Drinking caffeine at night can affect the sleep quality someone will have, therefore, make sure to limit consumption to the morning and afternoon as it can linger in the

body for several hours after drinking it. This stimulant should not be used to control appetite, it is to be used alongside daily food intake.

Fruit juices can be high sources of sugar and additives but drinking a high amount of juice at meals and throughout the day should be avoided as it can cause weight gain, it may not satisfy thirst and could make it difficult to have a well balanced diet. Consuming a lot of fruit juice can also have a bad effect on oral health as it has a high sugar content and is very acidic.

Also said by Challis and Stevens, carbonated drinks, are high in sugar and fructose corn syrup, artificial additives, sodium, caffeine and contribute to tooth decay as well as having a negative impact on digestion. Some drinks have zero calories but have different impacts on the body such as the impact on the brain to perceive them as metabolically active and may interfere with the body's weight and weight regulation. There is nothing in these drinks which can have positive health benefits to the body. Dancers should not drink these before and after high intense activity as they can cause stomach pain and a lot of gas within the stomach.

Energy drinks include a lot of caffeine, artificial additives and sugar. These also have very little nutritional value and are not recommended for dancers as they do not include good ingredients. They can cause heart conditions which can not be recognized, headache or migraine.

Sports drinks can help dancers and be beneficial for dancers who perspire heavily, who naturally have a low salt balance in their bodies and who train in very hot places. Sports drinks are also known as isotonic drinks which means that they include similar amounts of salt and carbohydrate particles to those found in bodily fluids.

Protein shakes and smoothies can be advertised to be consumed as meal replacements but for dancers that is incorrect as they should be taken in addition to the meal for extra calories and nutrients. Smoothies can be easy to over consume because they usually include numerous pieces of fruit and it's difficult to calculate how much fruit you should eat in an average serving. If too much fruit is consumed the natural sugar, which is part of fruit can be consumed in excess. These drinks should be consumed immediately after exercise, otherwise it will not replace the vitamins and they will be lost. Replacing vitamins which are lost is a vital process for dancers

Alcohol does not include any vitamins, minerals or proteins. Alcohol has dehydration properties in which are not healthy for the dancers who try and balance their fluids. The mixers which are usually consumed with alcohol are often carbonated drinks which are very quickly absorbed into the bloodstream and contain a lot of sugar which can lead to alcohol poisoning.

Muscular strength constructs speed and force which creates powerful movement. Research shows that dancers are not as strong and they should be, to be able to

uphold their technique and flexibility. Through the media it is evident that dancers massively focus on the component of stretching to increase their range of flexibility but are barely encouraged to complete their muscular strength training. To be able to keep healthy and have an extended career dancers should have an equal balance of flexibility and muscular strength.

Jumps, floor work, partner work and slow controlled movements are the elements of dance that are controlled by muscular strength. This strength will help aid control, execution and safety throughout movements. Without strength dancers are commonly forced into certain positions which their strength cannot aid. With the lack of focus on strength and heavily focused on flexibility, movements like the developpe can be very problematic as they have flexibility but without the strength in the legs but more importantly in the supporting leg they can develop an injury in the hip joint. In opposition, if the dancers have good strength in both legs it will give support to the joints and it will help improve position stability. If this happens, it helps the dancer hold the position for longer. Safe landings, effortless movements and decrease in the amount of soft tissue injuries are all positive factors of good muscular strength. This is especially useful for the high population of dancers with hypermobility.

According to Gertner, D. When a particular muscle shows speed and force within a movement against a resistance the brain sends messages to the muscle fibers to produce more of them to help them all work together to help the resistance being put on muscles. When resistance is used frequently the brain and the muscles fibers get

used to this process they will begin to adapt and get used to it which then leads to it becoming easier and the movement will become stronger and more efficient.

Pilates and yoga are activities which are popular for dancers as they have similarities with dance. Pilates and yoga massively help the strength, endurance, joint mobility and flexibility. These are both classified as body weight training which means that the weight of the body is the only resistance used.

Exercises to help muscular strength can be performed in a small proximity, short period of time and hardly any cost. These exercises can be Squats including legs in parallel and turned out. Squats massively help with posterior muscles, anterior muscles and help ankle joint mobility. Lunges are helpful as they focus on the quads and hamstrings which are massively important muscles for dancers as they need strong leg muscles. Bridge is massively helpful to be able to help core strength and hamstrings. It is very low impact exercise so it is accessible for everyone and even some injured dancers can keep up conditioning by doing these certain exercises. Weights and kettlebells are specifically useful for whole body muscular strength, especially to offer a more intense resistance to specific movements to build muscle and strength.

The overall perception on muscle strength is mostly focused on athletes particularly weight lifters when their muscles are very defined and big for their bodies which traditionally is not the image of a dancer's body. As dancers, when being able to do weight training they should use a high amount of reps with a lower weight within their

training sessions. This is important as the use of frequency over duration avoids overly defined muscles.

A dancer with a lot of muscular strength will be able to jump at high heights, be able to perform and execute a wide range of movements and be able to perform more complex movements. Dancers who have this will have a higher chance of a longer professional career. Up keeping this training with support will help develop the dancer's body to its fullest and greatest potential.

When researching anatomy and physiology I found an article focusing on the calf muscles which I chose to focus on for this component. All dance styles pay a lot of attention to the foot. For example, ballet focuses on the toes, tap focuses on the balls of the feet, Irish dance is always on releve. Within the modern and jazz genre their focus is a lot on the stretching of the feet through jumping which has a high focus on the calf muscles.

When dancers point their feet it is called plantar flexion and the two calf muscles, the soleus and gastrocnemius, are completely responsible for this happening. There are many different movements that are widely used which are mainly focused on the calf. For example, when the dancer releves, points their feet or the stretching of the foot within jumps, without the calf muscles contracting this would not happen.

The gastrocnemius is the muscle which is the most prominent muscle seen on the dancer's leg. This muscle is attached to the femur and crosses behind the knee. It

connects to the calcaneus by the achilles tendon. The jobs of this muscle is to flex or bend the knee and plantar flex the ankle. This muscle is responsible for particularly fast moving exercises such as walking, jumping or performing a releve. It is the muscle which massively helps the point of the foot.

The Soleus is positioned closer to the tibia and fibula, which are bones in the lower leg, but is found under the gastrocnemius. It runs the length of the whole calf and is the same as the Gastrocnemius, it connects the calcaneus to the ankle by the Achilles tendon. The soleus stabilises and maintain proper alignment at the ankle joint which can help the ankle from having a sickle. This muscle helps keep balance within any movement.

Without stretching the calf muscles they can get tight as they are constantly being used by dancers but stretching them will make them stronger. If the calf muscles are tight that leads to increased strain on the Achilles which will then cause inflammation and can cause tendonitis. When Achilles has too much strain it causes a big pull on the calcaneus, the bone in front then tilts the talus. The joint between the talus and navicular will then become misaligned which causes the foot to roll inwards which can cause further injuries.

If dancers maintain their flexibility in their calf muscles by making sure they keep their heels on the floor when doing demi-plies, connecting to the floor after releves and jumps. Stretching a lot will be a massive help towards maintaining flexibility but not losing any of their strength.

There are many stretches that can help with being able to regularly keep stretching the calf. These are downwards dog, laying on your back or using a resistance band. You can also lay both feet flat on the floor and lean towards a wall which will hugely help and be beneficial to the calf.

Dance is very beneficial for the brain and has recently been discovered to help Parkinson's disease which is a progressive neurological movement disorder. Dance stimulates the sensory and motor circuits which shows the complex mental coordination that dance requires. Some of the regions which are used to learn and perform dance are the motor cortex, somatosensory cortex, basal ganglia and cerebellum. The motor cortex plans control and is involved in the execution of voluntary movement. The somatosensory cortex which is found in the middle of the brain has a massive impact on the motor control and is key to good hand, eye coordination. The basal ganglia are a group of structures which are found deep in the brain and work a lot with other parts of the brain to smoothly coordinate different movements, but in contrast the cerebellum has a big focus on fine motor skills which also receives information from the spinal cord.

There are many studies which show what regions of the brain are heavily used and activated by dance but in contrast others have explored how the physical and expressive sections of dance can have an effect and alter the brain's functions.

Through research it has been found that dance is very helpful and therapeutic for people suffering with Parkinson's disease. "According to the Parkinson's Disease Foundation, each year another 60,000 are diagnosed with the disease. Parkinson's disease belongs to a group of conditions called motor-system disorders, which develop when the dopamine-producing cells in the brain are lost" (Parkinson's foundation, 2016). Dopamine is an important chemical which helps the brain control movement and coordination. When Parkinson's disease progressively gets worse the number of brain cells end up dying. When this occurs the amount of dopamine to the brain is decreased.

Edwards (2019) states that there are many symptoms which are signs of the disease getting worse. Some of these may be slowed movement, stiffness of the limbs and trunk, tremors, and impaired balance and coordination. These symptoms can be eased by dance. Through research dance can be seen as rhythmic auditory stimulation (RAS). During this technique different rhythms are shown and the patients are asked to move to different rhythms. "Studies of the effects this technique has on patients with Parkinson's or other movement disorders have found significant improvements in gait and upper extremity function among participants. Although there have been no side-by-side scientific comparisons of RAS with either music or dance, Tarsy says people with Parkinson's "speak and walk better if they have a steady rhythmic cue (Edwards,2019)."

These four components have all shown the different aspects of keeping a dancer healthy and I have found a key aspect from each article which will be able to aid me

to improve as a dancer. In the nutrition article I learnt that dehydration of 3% of the body can cause serious symptoms which can heavily affect a dancers training and up keep of fitness and health. Article two focusing on muscular strength I found interesting that when a particular muscle works against a resistance with speed and force it sends messages to the brain to produce muscle fibers so it produces more so more intense exercise can be put on the muscles. With the calf muscles in article three I discovered that the calf muscles are most widely used in all dance styles. The dopamine produced in the brain is the main factor in the brain that helps control movement and coordination, this was a very interesting fact as I did not know that this controlled the focus of movement and coordination. These are major parts of dance which is very interesting to know as a dancer.

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