

Physiological and therapeutic impact of Bharatanatyam classical dance

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Abstract

Introduction - Dance therapy is a phenomenon which works to improve the neurotransmitters called endorphins which are eventually responsible for improving the wellness of humans. This therapy balances the body movement, body mass, improves blood circulation, respiratory mechanisms and muscular functioning of the body.

Objective - The main intention of the research is to analyse the role of Bharatanatyam dance and its physiological and medical significance on performers who are regularly practising dance.

Methodology - The primary data were collected by a random sample method based on the survey conducted over people who regularly performed Bharatanatyam dance. Around 50 samples were collected from random people who comprised two groups: the dance group and the non-dancer group

Results - Dance practitioners were not affected on arthritic, respiratory challenges and mental issues in comparison to the non-dancer groups. Under the physiological impact it was evaluated that flexibility, body balance and body stamina were also enhanced in the dancers in comparison to non-dancer groups.

Keywords: Bharatanatyam Dance, physiological impact of Bharatanatyam Dance, therapeutic impact of Bharatanatyam Dance.

1. Introduction

Bharatanatyam Classical Form of Dance

One of the most famous classical dances of Tamil is Bharatanatyam which originated from South India and flourished in Sri Lanka. It is profoundly correlated with Tamil enriched culture. Chronically it is immersed in Tanjore of Tamilnadu (Acharya, C., & Jain, M., 2017). It embraces every conventional aspect of classical dance *mudras*: positioning of hands, *abhinaya*: expression of face, *padama*: narrative dance. This form of dance appropriately uses the hand and eye movement to express different emotions and feelings. It is a combination of emotion, music rhythm, and expression. It is mudra oriented and gives significance to *padartha abhiyan*, where every word is expressed through mudra. To significantly express the emotions and the inner feelings. The divinity of Bharatnatyam is *Natarajar* who is the dancing divine Shiva (Chatterjee, A., 2013). It was founded by Saga Bharat Muni who elaborated the philosophy of Bharatnatyam. It is widely spread throughout the world and popular in classic dance by the Tamil community.

Dance Therapy and its Physiological and Therapeutic Impact

Dance is the activity that provides a non-competitive form of exercise that has a capability to significantly impact on the physical and mental well-being of the practitioner. It is scientifically proven that the performers irrespective of gender who practise dance are physically fit and also this physical activity assists in enhancing lung functioning, lung capability, flexibility, and aerobic potency (Pai, R., 2020). Dance therapy is a phenomenon which works to improve the neurotransmitters called endorphins which are eventually responsible for improving the wellness of humans. This therapy balances the body movement, body mass, improves blood circulation, respiratory mechanisms and muscular functioning of the body (Kumari, N., 2021). Dance therapy is specialised and the therapeutic function of dance has a capability to enhance and improve cognitive, behaviour and physical well-being. It is an activity that aligns the body, mind, and physical state that correlates with emotional, spiritual and conscious health. Dance therapy and Ayurveda proclaimed that it has a strengthening to heal and inner awareness (Chivukula, V. L., & Inupakuttika, S. P., n.a).

Bharatanatyam and its medical importance-

- Head movement, eye movement, leg beats, hand and finger movements and facial expression are more enthusiastic in Bharatanatyam. This movement plays a significant role in balancing the rhythmic of the body movement and assists in significant brain functioning.
- From head to feet every muscle of the body takes an active role in performing dance.
- Not only muscles, joints and organs are also actively participating, and this active movement is fulfilled by good oxygenation.
- Dancer needs to coordinate steps with music this makes them more balanced because they are effectively coordinating their mind and body consciously and unconsciously. Thus, they lead more success and a balanced life.
- Adaptability, switching, flexibility are the features of the Bharatnatyam that improves organ functioning and the performer leads a healthy lifestyle.

1.1 Background

From chronic, Indian classical dance and its enriched history responsible for betterment of health of performers who perform it regularly. Prominently because classical dance is compared with *yogic* in the form of physical and mental exercise. Indian classical dance can be sub categorised into 8 different types such as Kathak, Bharatanatyam, Manipuri, Kathakali, Odissi, Kuchipudi, Sattriya and Mohiniattam (Shenoy, S., 2019). All these dances have a distinct degree of similarity because they found its bedrock in *Natyashastra*. It is a psychology that is based on *natya* involving *geet* (song), *vadhyā* (music) and *nritya* (dance). Thus, some common features they embrace like mudras body posture, dramatic or expressive action. Classical dance has a quality that connects mind and soul and channelises in the form of communication that brings out in most consciousness and at the same time depicts the cultural aspiration. This form of dance also has different kinds of eye movement and the eye is also liable to create intense expressions, and feelings (Ponmanadiyil, R., & Woolhouse, M. H., 2018).

According to Natyashastra:

“Four strategies of representation (*abhinaya*), such as gestures (*angika*), words (*vacika*), make-up (*aharya*) and the sattva (*sattvika*), the *angika* embraces physical presentation by employing different gestures and postures”.

2. Literature Reviews

Mind, body, and spirit incorporation with each other is very beneficial for balancing human functioning and well-being. Dance is an activity that synchronises humans spiritually, cognitively, and physiologically. Dances responsible for the neurological, muscular, and emotional functioning of the body in a constructive manner. The motive of the research (Chatterjee, A., 2013) is to analyse how these parameters assist consciousness and feelings to assure an improved well-being by regular practising of dance. The finding shows that dancing plays a significant role in enhancing dedication, mental tolerance capability and conscious activities and patience, flexibility throughout by practising dance. The study predominantly focuses on Indian classical dance form as it involves vigorous and dedicated footwork, vast variety of hand gestures and graceful practice of dance.

Another research (Pai, R., 2020) focuses on three prominent components are abhinaya, gesture and navrasas. Because this component is effectively utilised for expressing various expressions through movement. Moreover, this component has therapeutic significance and has wellness implications for those who regularly practise dance as mentioned by American Dance Therapy Association and this type of dance practice comes under dance movement therapy. This review emphasises the characteristics of Indian classical dance and dance movement therapy by exploring their significance and benefits on the overall health of the practitioner.

The motive of the study (Rajeev, S. P., 2014) is to identify the medical and social significance of Bharatanatyam as well as to generate awareness among the next generation regarding Bharatanatyam. The study collected 50 responses based on random sampling and data collected from the North part of Sri Lanka through an open questionnaire. The finding reveals that most of the practitioners have balanced family life and are satisfied with no physical dys-functioning or abnormalities. The dancers are successful in their respective work area and develop intelligence and talent depending on their interest.

The intention of the research (Jyothi, S., & Sujaya, B., 2018) is to analyse upper and lower limb muscle strengthening in female Bharatnatyam dancers and compare it with non-dancers. In all 55 data samples were collected and height, weight, and BMI were measured. To analyse the lower limb 6M hop test and walls sit test is used while for analysis upper limb push up test is used. Data reveals that in comparison to non-dancers Bharatanatyam dancers take less time to hop 6 m and can sit for a long time against a wall. Eventually, it may be extracted that dancers perform more push ups and have better lower and upper limb muscle strengthening. Another study (Mukherjee, S et al., 2014) was undertaken to determine Bharatanatyam dance and its effect on body composition of Bengali female children. The data is collected from dancers who belong to the age group of 12 to 18 years and pretty receive training for at least five years and practise dance for 1 and six days a week. Another group is of children who are of the same age with no such physical activities taken. The finding reviews that girls who are performing Bharatanatyam regularly have a more favourable impact on their body composition in comparison to other groups. Moreover, they are less prone to obesity in adulthood.

2.1 Research Gap

Most of the research work is associated with classical dance and its association with physical and mental well-being (Chivukula, V. L., & Inupakuttika, S. P. et al., n.p; Chatterjee, A., 2013). But very few existing studies are concentrated on Bharatanatyam and its medical significance (Rajeev, S. P., 2014). Moreover, none of the research found its incorporation with physiology, therapeutic and its impact on the dancers who are actively practising Bharatanatyam. Thus, this manuscript is intended to resolve this research gap by exploring the importance of Bharatnatyam and its positive impact on dancers' physiological and therapeutic wellness.

2.2 Research Question

- Determine the physiological impact of Bharatanatyam Classical form of Dance?
- Determine the medical significance of Bharatanatyam?

2.3 Importance of the Study

Dance is acknowledged to release the neurotransmitters known as endorphins which are responsible for improving our wellness. There is some evidence that proves that Indian classical

dances have significant therapeutic value. Bharatnatyam is well known for its emotional health and psychotherapy. It provides strengthening for hamstring muscles involving semi-membranous, semi-tendinous, biceps and others. Bharatnatyam effectively emphasises expression, rhythm and movement of hands, eyes, legs and so on. The significance of the study is to identify the utility of Bharatanatyam Dance and its effectiveness in diverse ways. For this perspective, the study explores Bharatanatyam classical dance from two prominent viewpoints such as physiological and therapeutic.

2.4 Research Objectives

The main intention of the research is to analyse the role of Bharatanatyam dance and its physiological impact on humans. Moreover, identify the medical significance of dance over dancers who regularly perform Bharatanatyam from long.

2.5 Scope and Limitation

Dance can be identified as a psychological way of expressing feelings and emotions. Thus, it is used to analyse people who are suffering with depression, anxiety, eating disorders and other psychosocial problems. Classical dance has certain characteristics that assist practitioners to release their anxiety as it has eye movement, hand gestures that assist them to express happy or sad emotions. The scope of the study is to explore Bharatanatyam classical dance and its relevance with physiological and therapeutic significance on dancers who are regularly performing it.

3. Research Methodology

3.1 Research Method & Design

Researchers anticipate the appropriate methodology based on the demand of the theme of the study and the research question prepared for conducting the research. Research design involves distinct types of approaches covering descriptive, exploratory, and analytical techniques. This research opt descriptive strategy for exclusively accomplished research.

3.2 Research Approach

The objective of the manuscript indicates worthy and desirable methodology as a Quantitative approach that is exploratory in nature. Under a quantitative approach, a descriptive strategy is chosen which is based on primary and secondary data. The primary data were collected by a random sample method based on the survey conducted over people who regularly performed Bharatanatyam dance.

3.3 Sample size

Around 50 samples were collected from random people who comprised two groups: the dance group and the non-dancer group. 29 participants were from Bharatanatyam performers and 21 participants belonged to the non-dancer group.

3.3 Hypothesis

H0: There is no therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups.

H1: There is therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups.

4. Analysis of Study

The analysis part can be divided into demographic analysis, hypothesis assessment and questionnaire exploration. Further research questions are also explored in this section.

4.1 Demographic Analysis

Demographic Variable	Categories	No. of responses	Percentage
Gender	Male	21	42%
	Female	29	58%
Age Group	23-30 Years	23	46%
	30-45 Years	16	32%
	Above 45 Years	11	22%
Professional Experience	Below 5 Years	8	28%
	Between 5-10 Years	6	21%
	Between 10-15 Years	5	17%
	Between 15-20 Years	5	17%
	More than 20 Years	5	17%
Group	Dancer	29	58%
	Non-Dancer	21	42%

4.2 Questionnaires Description-

To determine the physical and medical activity of the participants the Questionnaire were prepared. And the detailed Questionnaire is attached in the Appendix-1. The evaluation of the data below is based on these Questionnaire.

To determine where participants are suffering from joint pain and having stress or anxiety.

Joint Pain and Stress and Anxiety

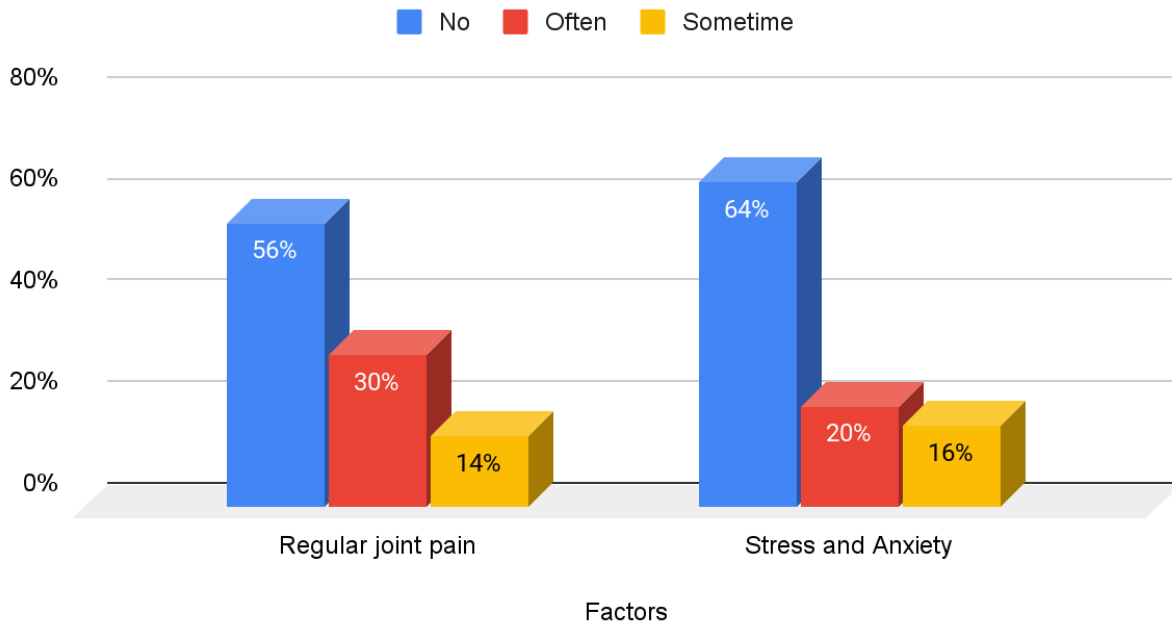


Fig.1: Joint pain & Stress or Anxiety

The finding shows that 56% of the participants did not find joint pain and 64% of the participants did not find any stress or anxiety. On the other hand, 30% of the participants have regular joint pain and 20% of the participants have often been associated with stress and anxiety related.

Another parameter was flexibility to determine whether you can sit on the floor with legs straight and reach for toes, bend over, pick something, get into a tuck position and others.

Flexibility Parameters

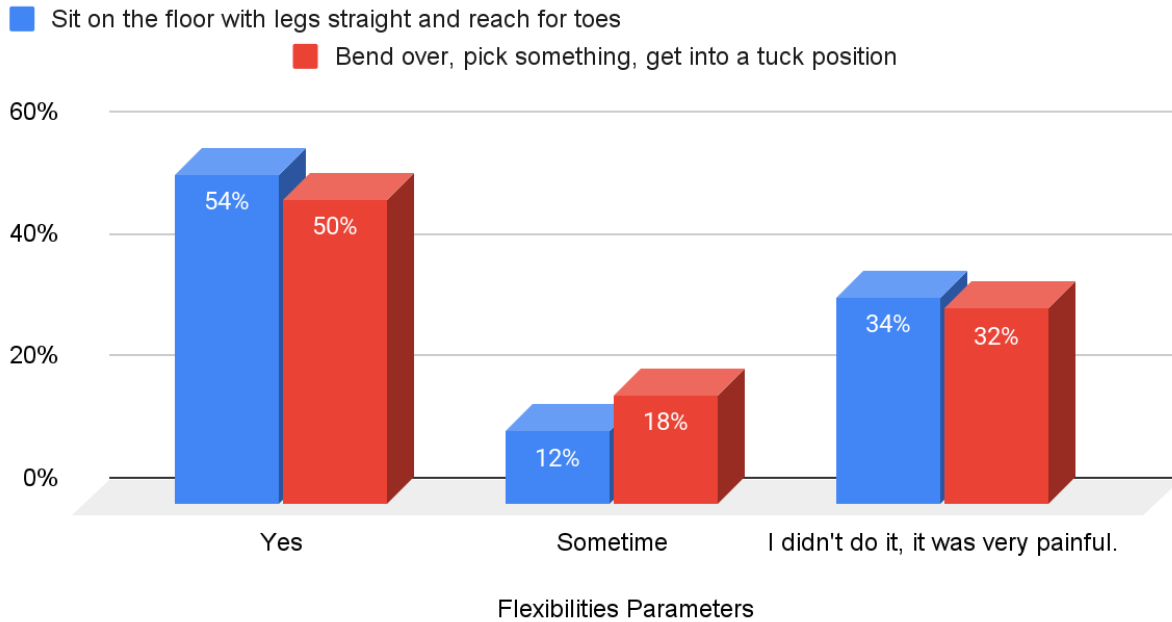


Fig. 2: Flexibility Parameters

The finding shows that 54% of participants could sit on the floor with their legs straight and reach for their toes. Further, 50% of the participants can easily bend over, pick something, or get into a tuck position. While 34% of the participants did not reach their toes or make their legs straight as well as 32% of the participants did not bend over, or tuck position.

Breathing Challenge

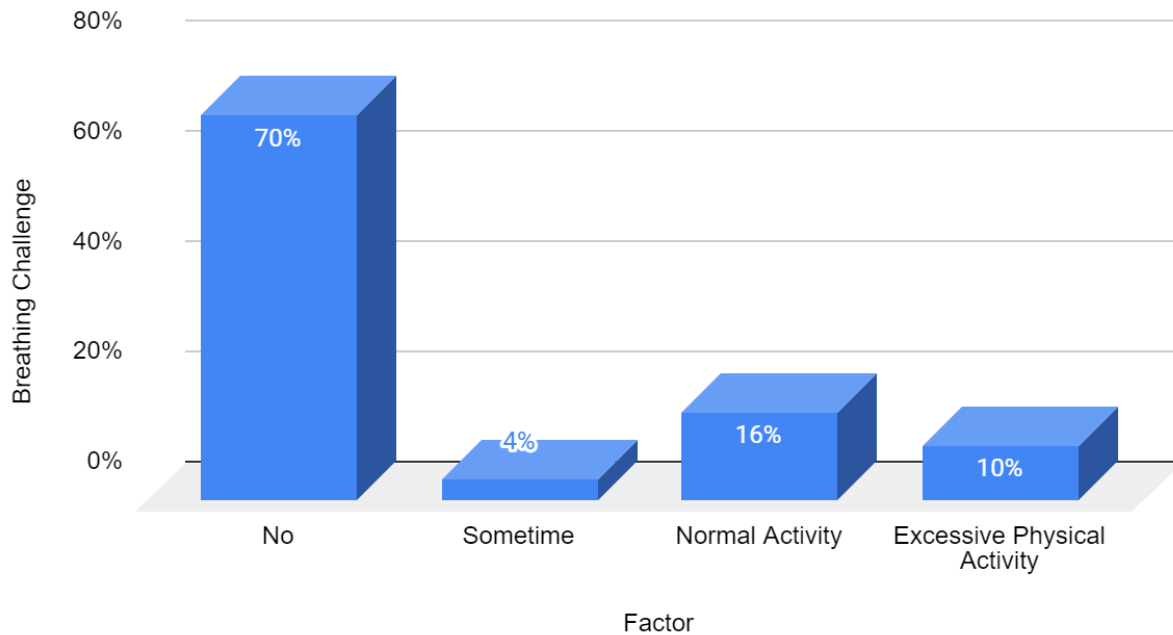


Fig.3: Breathing Challenge

The question related to breathing challenge was asked and the finding shows that 70% of the participants do not have any breathing issue. While 10% of the respondents addressed breathing issues when they have excessive physical exercise, the other 16% of the respondents have breathing issues with normal activities.

Do you need to visit doctor/ physician on regular basis

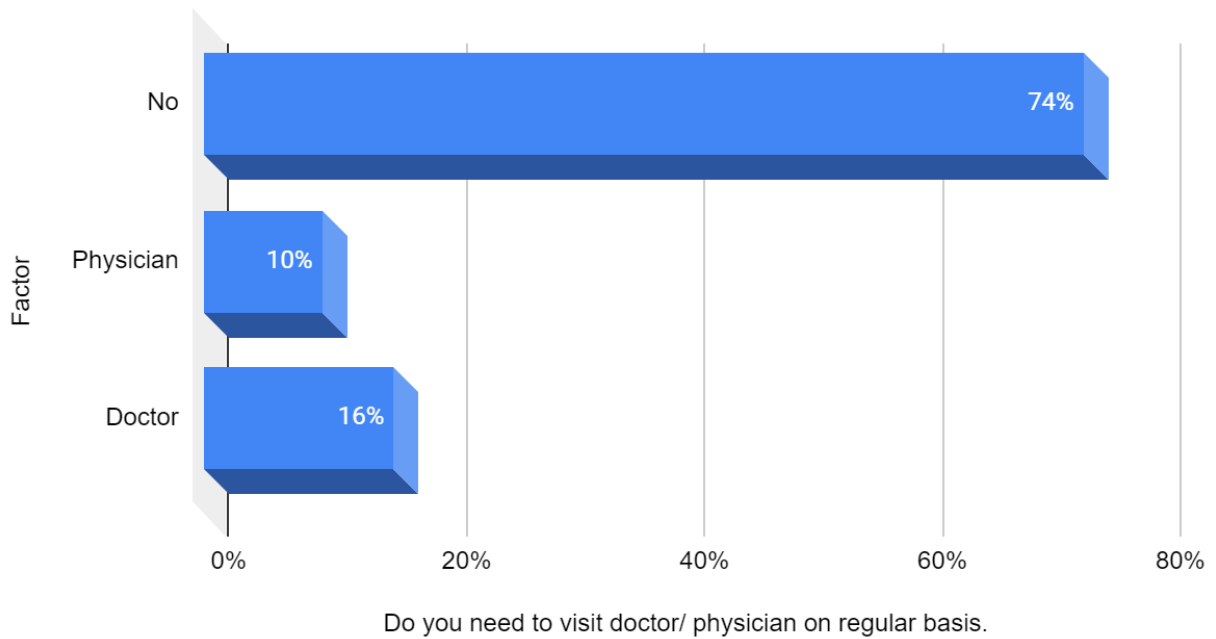


Fig.4: Regular visiting Doctor or Physician

The finding reveal that 74% of the participants do not regularly visit either doctor or physician. Other than dancers, non-dancers need to regularly visit a doctor (16%) and Physician (10%) as mentioned in figure 4.

Do you have a balanced body?

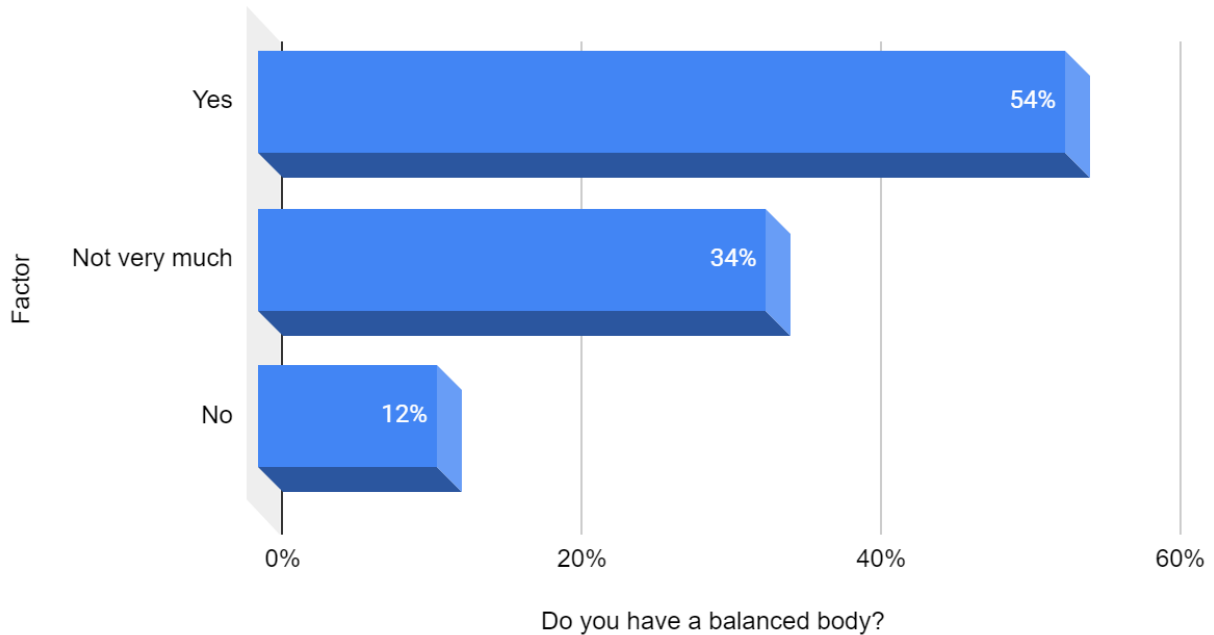


Fig. 5: Balanced Body

Physical activities lead to a balanced body, when a person regularly performing Bharatanatyam has an owner of attractive physics and has balance between mind, body and soul. To determine if participants have a balanced body, this question is included in the questionnaire. The finding shows that 54% of the participants have a balanced body, while 34% are not very satisfied and 12% do not have a balanced body.

4.3 Hypothesis Assessment

H0: There is no therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups.

H1: There is therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups.

To prove this hypothesis, the table is prepared based on participants who are addressed with abnormalities among dancer and non-dancer groups.

Factor	Dancer Group (Out of 29)	Non-Dancer Group (Out of 21)
Joint Pain	5	17
Breathing Issue	2	13
Stress and Anxiety	2	16
Verbal Challenge	1	12
Visit to Doctor/ Physician	2	11
Flexible	2	21
Balance Body	3	21

Table 1: Comparison among both the groups.

Anova Test was applied to determine the significance among the dancer and non-dancer groups.

ANOVA					
Source of Variation	SS	df	MS	F	P-value
Between Groups	631.142	1	631.142	68.496	0.0002
Within Groups	110.571	12	9.214		
Total	741.7142	13			

Table 2: Anova test

Because p-value = 0.002, which is smaller than $\alpha = 0.005$, this shows the null hypothesis which proclaimed that there is no therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups is rejected while accepting the alternative hypothesis which exhibits that there is therapeutic and physiological impact on Bharatanatyam performers in comparison with non-dancer groups.

Question 1: Determine the physiological impact of Indian Classical Dance?

Dance effectively coordinates multiple organs and body parts. Along with this the beat and the music provide a sense of feeling and the expression of the song provides essence to perfectly

meet the beats in time (Chatterjee, A., 2013). This sense of beat enhances the sensing activity of the brain and makes the dancer more intrusive. Intending to match the beat and the steps of a dance mind always needs to be calm, concentrated, which requires uniformity in performance with dance timing. This active and continuous working of the brain makes it more productive, focused, and skilful (Kumari, N., 2021).

- While performing the dance, the whole body and every muscle from head to toe actively participates in the activity. Muscles, joints and organs also take active participation because of movement and are submerged with proper blood circulation.
- By performing Bharatanatyam several steps are like touching half the bend of the knee or the full bend of the knee. Knee bending is an exercise performed to enhance the wellness of the hip and knee. The external rotation of the hip is the powerful position that is associated with other lower body parts like the thigh, knee, calf, leg and feet, and ankle muscles (Acharya, C., & Jain, M., 2017).
- The movement that is associated with the upper limb or hand provides balance exercises of the vertebral column, spinal cord, arms and forearms muscles, shoulder, elbow, wrist and finger joints.
- Any physical activity enhances the breathing rate and while performing dance one needs to balance the inhale or exhale process in order to maintain the coordination among the steps, body and music. This uniformity of proper inhaling an existing contract and relaxing the lungs and responsible for healthy lungs and respiratory system (Jyothi, S., & Sujaya, B., 2018).
- In Bharatnatyam, the most enthusiastic element is facial expression, eye movement, as well as head movements. The muscles of the head, eye and face are properly exercised by performing dance activities. This strengthens and flexes the facial and head muscles (Ponmanadiyil, R., & Woolhouse, M. H., 2018).

Other than this, flexibility, body balance and body stamina is also enhanced in the dancers in comparison to non-dancer groups. Data reveals that 93% of dancers found they were actively flexible and their body was well-balanced. Around 97% of the participants do not need to visit a doctor/ physician on a regular basis. 90% of the respondents found satisfactory body stamina.

Question 2 Determine the therapeutic impact of Indian Classical Dance?

Dance, sound, and physical activity are correlated and act as a form of therapy that assists to less mental fluctuation, maintain body balance, increase physical activity, as well as enhance social interaction and diversity in livelihood. Through regular practising of dance it stimulates the endocrine system for the physical and behavioural response of humans.

- It intensifies the secretion of “Happy Hormones like Adrenaline, Endorphins, Serotonin, Dopamine.” Adrenaline improves strength, motivation, flexibility, and focused determination to stay dedicated. Endorphins help to feel joyful and cheerful; Serotonin assists in proper sleeping and relaxation. Dopamine offers effective physical balance and makes you a multitasker.
- Dance can act as a therapy for those who are found in those who have gone through verbal counselling or address nonverbal issues. People who are suffering with mental abnormalities and it is hard to express their feelings verbally.
- Bharatnatyam also emphasises on lowering the rate of stress, anxiety, and depression related activities. As the 93% of the participants who are dancers do not address stress or anxiety in their entire life.
- By active brain exercise several neurological benefits are correlated with Bharatanatyam and assist to prevent a number of brain related disorders like Parkinson's disease, Autism, depression, eating disorder, Schizophrenia and others (Bek, J. et al., 2022).
- A study (Shenoy, S., 2019) proves that by utilising Bharatanatyam therapy children can improve their hearing impairment. The finding shows that by appropriately utilising the

technique called Natyakarma, hearing impaired individuals can enhance their hearing capability, social interaction skills and imitation skills are also improved.

- Another study (Kulkarni, M et al., 2018) mentioned that Bharatnatyam helps in enhancing core stabilisation exercise and core stabilisation with kinesio-taping that is effective for lower back pain and core strengthening.
- The study investigates Bharatanatyam dance therapy over the children and adults who are associated with Down Syndrome. The finding shows that Bharatanatyam therapy acts very crucial as it overall builds strengthening as data shows 34%-86% enhancement, boost cardiorespiratory around 27% to 60 %, overall balance of the body, and transforms the body composition.

The finding also proclaimed that dance practitioners were not affected on arthritic, respiratory challenges and mental issues in comparison to the non-dancer groups. As the data indicate 81% of the non-dancer group suffer with joint pain in comparison with 17% of the dancer group who seldom addresses joint issues. When it comes to mental abnormalities only 7% of the dancers are associated with stress or anxiety while 74% of the non-dancer group suffer with stress or anxiety. For respiration effectiveness, 93% of dancers did not find breathing issues, in comparison with 38% of the non-dancer group.

5. Results

Bharatnatyam helps to prevent degeneration or catabolism of the body and increases the wellness of the body, it induces anti-ageing procedures of the dancer. Another characteristic of classical dance Bharatanatyam is that it provides a friendly environment free from fear where anyone can explore itself, believe in the inner self, feel the senses. It is a spiritual practice of self-discovery illuminating the sense of life on and off the dance floor. One of the studies proclaimed that body functions similar to muscular skeletal activities when swimming or Bharatanatyam is performed. These are powerful exercises for the complete body and make humans healthy and prevent them from non-communicable diseases. It is a form of body-oriented psychotherapy that diverts the mind to advanced body activity as well as programmed body movement.

Bharatanatyam therapy, the overall improvement was demonstrated in the development of students, specifically the coordination, concentration, and expression. It is an art therapy being therapeutic in nature, responsible for passive and active muscular movement. Eventually intensify the physical, mental, cognitive, and emotional well-being of a dancer.

The empirical analysis may have extracted that non-dancer group associated with several skeletal and respiratory dys-functioning in comparison to Bharatanatyam participants. Other than the mental challenges like stress or anxiety and other issues were also found more frequently in non-dancer groups rather than in dancer groups. Dancer groups also do not find any challenges associated with respiratory functioning, body stamina, body balancing, or flexibility, although the non-dancer group is associated with several physical and medical challenges.

6. Conclusion

The research is intended to explore the characteristics of Bharatanatyam Indian classical dance style and examine its significance over physical and therapeutic impact on dance performers. The researchers chose empirical analysis over the number of participants who were willing to share their perceptions and these participants could be bifurcated into dancer and non-dancer groups. Bharatanatyam is well known for its enthusiastic expression, dancers can utilise their body as a tool to express emotions and communicate feelings which they are unable to express normally. The research formulated a hypothesis, and it proves that Bharatanatyam has a positive impact on a dancer's physical and medical condition. The evidence is also proved by several other studies. Eventually, it may be concluded that performers have an enrichment of mental and physical well-being due to the practice as they match the beat and the step of a dance their mind, and body always needs to be calm, concentrated, which requires uniformity in performance with dance timing and makes them balanced. This balancing reflects their whole body and is responsible for the appropriate coordination of the physical, mental, cognitive, and emotional well-being of a dancer. Moreover, dancers live a more satisfied and happy life.

6.1 Future Scope

In future, the research may collect large data samples for profoundly analysing the impact of Bharatanatyam on dance practitioners. Moreover, the future research can emphasise on investigating the significance of dance therapy by empirically determining the correlation between lifestyle diseases (related diseases like hypertension, diabetes) with Bharatanatyam performers, and work towards finding cure for lifestyle diseases using dance as a therapy.

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Appendix-1 (Questionnaire)

Gender

- a. Male
- b. Female

Age Group

- a. 13-30 Years
- b. 30-45 Years
- c. Above 45 Years

Your Belonging Group

- a. Dancer Group
- b. Non-Dancer Group

Your Professional

- a. Student
- b. Professionals
- c. Teachers

Experience in Dance

- a. Below 5 years
- b. Between 5-10 years
- c. Between 10-15 years
- d. Between 15-20 years
- e. More than 20 Years

Do you suffer from stress and anxiety?

- a. No
- b. Sometime
- c. Often

Do you suffer from regular joint pain?

- a. No
- b. Sometime
- c. Often

Did you find any breathing challenge?

- a. No
- b. Sometime
- c. Normal activity
- d. Excessive physical activity

How often do we need to sit on the floor with legs straight and reach for toes?

- a. Yes
- b. Sometime
- c. I didn't do it, it was very painful.

Do you bend over, pick something, get into a tuck position or even kick something ?

- a. Yes
- b. Sometime
- c. I didn't do it, it was very painful.

Do you have verbal issues?

- a. No
- b. Yes
- c. Not Frequently.

Do you need to visit a doctor/ physician on a regular basis?

- a. No
- b. Doctor
- c. Physician

Do you find yourself flexible?

- a. Yes
- b. No
- c. Not very much

Do you have a balanced body?

- a. Yes
- b. No
- c. Not very much

Are you satisfied with your life?

- a. Good
- b. Satisfied
- c. Poor