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COMPARATIVE ANALYSIS OF HEALTH-RELATED PHYSICAL FITNESS PROFILES BETWEEN COLLEGIATE DANCE PERFORMERS AND YOGA PRACTITIONERS

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Abstract: Background: The socioeconomic transformations in India over the past decade have contributed to increasingly sedentary lifestyles and a corresponding decline in constitutional physical fitness. Identifying engaging, culturally integrated physical modalities is vital for promoting sustainable physical conditioning. Objective: This study evaluated and compared the health-related physical fitness and physiological profiles of collegiate dance performers and yoga practitioners in Punjab, India. Subjects and Methods: Eighty male collegiate students (N = 80, aged 17–25 years) from colleges affiliated with Punjabi University, Patiala, Punjab, India, who actively participated at the inter-college level, were selected via simple random sampling. The sample was divided into two equal cohorts (n = 40 per group): Group A (Dance Performers) and Group B (Yoga Practitioners). Quantitative measures were obtained for anaerobic capacity (speed), arm strength, abdominal strength, cardiovascular endurance, trunk flexibility, blood pressure (systolic and diastolic), and resting pulse rate. Between-group differences were analyzed using an independent samples t-test with the significance level set a priori at alpha = 0.05. Results: The inferential analysis revealed that dance performers achieved significantly better scores in anaerobic speed ($t = 14.72$), arm strength ($t = 12.23$), cardiorespiratory endurance ($t = 2.65$), and resting pulse rate ($t = 14.70$) compared to yoga practitioners ($p < 0.05$). Conversely, statistically insignificant differences were observed between the cohorts regarding abdominal strength ($t = 0.83$), trunk flexibility ($t = 0.86$), systolic blood pressure ($t = 1.30$), and diastolic blood pressure ($t = 1.96$, $p > 0.05$). Conclusions: Both dance and yoga serve as highly effective modalities for enhancing abdominal strength, trunk flexibility, and blood pressure regulation. However, high-tempo dance training provides a superior cardiovascular stimulus, resulting in greater anaerobic speed, arm strength, and cardiorespiratory endurance. Engaging in these activities is recommended across all age groups to develop and maintain balanced, holistic physical health.

Keywords: Health-Related Fitness, Dance Performers, Yoga Practitioners, Anaerobic Capacity, Cardiovascular Endurance, Flexibility.

1. Introduction

Health-related physical fitness is typified by an ability to perform daily activities with vigor and is related to a low risk of chronic disease. Cardiorespiratory endurance, musculoskeletal fitness (muscular strength

and endurance, flexibility), and optimal body composition are the measurable components of health-related fitness. Skill-related fitness, on the other hand, has more to do with agility, balance, coordination, speed, power, and reaction time (sport skills) and has little relationship to health and disease prevention.

Fitness plays a vital role in the performance of all sports and team games. The word "Fitness" has been discussed and explained by physical educators, coaches and medical professionals in numerous ways in relation to performance in games and sports and organic health. The literature of fitness has a variety of interpretations of the construct. Each one of the professionals keeps in mind his own expectations from a human body and defines "Fitness" in his own way. Different terminologies like "Motor Fitness", "Physical Fitness", "Total Fitness", "General Fitness", "Athletic Fitness", "Organic Fitness", and "Health Related Physical Fitness" are in practice.

Fitness especially Motor Fitness is regarded as an essential component even if the term consists of highly skilled technically scored and experienced players. Motor Fitness is gauged by performance and this performance is based on the outcome of many factors such as Strength, Endurance, Power, Speed, Agility and Flexibility. Some of the factors evidently are more dominant than others and thus have a higher relationship with Motor Fitness. Scientists and Physiologists have been of the view that Anthropometric Measurements and Physical Components of an athlete have a lot to do with his Performance. More than the technique and tactics of a player or a team, Physical and Physiological characteristics help him for better performance. Most of the games demand a higher level of Speed, Strength, Endurance, Flexibility, Coordination and optimum fitness of the organism for higher performance (Johnson, 1974).

Scientific study of exercise physiology is becoming increasingly important with the growing realization of the relation of exercise to health. Field and laboratory observations on exercising human subjects are being supplemented with physiological and bio-chemical studies on laboratory animals. With the result that many of the phenomena associated with acute and chronic exercise can now be explained at cellular and molecular levels (Morehouse, 1972).

The number of components that suffer displacement during a bout of exercise is large; they are evidently linked with one another in a pattern of interlocking controls. For example, pulmonary ventilation, frequency of heartbeat and rise of blood pressure are each a part of the exercise syndrome. Each environment and surface in a component may be regarded as a strain to which the physiological body is subjected (Adolph, 1974).

Music is a source of motivation and inspiration that is much valued within the realms of sport and exercise. Given the ubiquity of music in such environments, its application as a mild but perfectly legal ergogenic aid has raised considerable interest among researchers over the last four decades (Karageorghis and Terry, 1997; Lucaccini and Kreit, 1972). Many individuals prefer to involve in yoga and dance with music while getting fit rather than engaging in fitness activities like running, cycling, or stair climbing. The competitive and social aspects of sports make them enjoyable for many, and help promote long-lasting compliance (one of the greatest challenges in exercise training). Yoga is able to achieve oneself to be fit spiritually, morally, physically and mentally; it is essential to involve oneself in yogic exercises. Even West and other researchers in the year 2004 concluded that both dance and yoga decreased perceived stress and negative effects.

2. Methodology

2.1 Study Design and Setting

A simple random sampling technique was used to select the sample. The investigator visited Punjabi University, Patiala, and obtained the list of colleges which have participated in inter-college competitions in dance performance and yoga practice. Then the subjects were randomly selected from those colleges. Thus, 80 males were selected (40 subjects were dance performers and 40 were yoga practitioners). This study was approved by the ministry of health at Punjab state in India.

2.2 Sampling

In the present study, subjects between the age group of 17 to 25 years were selected from the different colleges affiliated to Punjabi University Patiala of Punjab state who have participated in dance with music and yoga at the inter-college level.

2.3 Study Tools and Testing Protocols

The investigator used specific tools for health-related fitness testing. The purpose of data collection for this study was to measure Speed, Explosive Strength, Arm Strength, Abdominal Strength, Cardio-Vascular Endurance, Trunk Flexibility, Blood Pressure (Systolic and Diastolic), and Pulse Rate (Bailey, 2009).

The authors selected 140 up-tempo tracks for dancing with music. The tracks were then recorded from compact discs onto a mini-disc (Sony MDW74CRG) using a hi-fi system (Sony CMT-CP505MD). A DJ mixer unit (Numark 940 XL) and a dual deck player (Numark 8868) were used. The authors then recorded 90 sec excerpts from the remaining 32 tracks, with each excerpt including at least one verse and one chorus (Gluch, 1993).

The subjects also underwent yogic training through a specialized training program under the strict supervision of the researcher. The subjects performed asanas for health-related fitness that included Poornabhujangasana, Dhanurasana, Baddhapadmasana, Kukkutasana, and Halasana.

2.4 Statistical Analysis

To study the significance of the difference among dance performers with music and yoga practitioners with respect to selected physical and physiological variables (speed, strength, endurance, flexibility, blood pressure, and pulse rate), the statistical technique of the t-ratio was applied.

3. Results

The study was conducted to determine the health-related fitness of dance performers with music and yoga practitioners. The statistical analysis of data collected on eighty (N=80) subjects. For each of the chosen variables, the results pertaining to a significant difference, if any, between dance performers with music

and yoga practitioner groups were assessed by the independent "t" test (Edwin, 2000) and are presented in Table 1.

Table 1: Mean, Standard Deviation, and 't' Value of Health Related Fitness Variables

Group	Variables	Number	Mean	S.D.	t-Value
Music / Dance	Speed (s)	40	6.55	0.31	14.72*
Yoga		40	7.64	0.25	
Music / Dance	Arm Strength	40	24.20	2.73	12.23*
Yoga		40	17.40	2.18	
Music / Dance	Abdominal	40	27.50	3.52	0.83
Yoga	Strength	40	26.90	3.40	
Music / Dance	Endurance (min)	40	1.39	0.031	2.65*
Yoga		40	1.51	0.033	
Music / Dance	Flexibility (cm)	40	9.95	0.18	0.86
Yoga		40	10.00	0.00	
Music / Dance	Systolic BP	40	122.03	1.59	1.30
Yoga	(mmHg)	40	121.55	1.66	
Music / Dance	Diastolic BP	40	81.82	1.44	1.96
Yoga	(mmHg)	40	81.15	1.62	
Music / Dance	Pulse Rate (bpm)	40	64.60	2.42	14.70*
Yoga		40	72.10	2.10	

**Significant at 0.05 level of confidence; Critical Tabular t_0.05(78) = 2.64*

Thus it may be concluded that the health-related fitness of dance performers and yoga practitioners showed significant differences in anaerobic ability (Speed), arm strength, endurance and pulse rate, and insignificant differences in abdominal strength, flexibility, systolic blood pressure and diastolic blood pressure. As per the study, the above remarks can be given at 95% confidence.

4. Discussion

The present study evaluates the health-related fitness of dance performers and yoga practitioners in Punjab, India. Today sportspersons are trained scientifically with the latest training methods and sophisticated instruments for higher performance improvement in different spheres of sports (Peter, 1972). Physical activity has been recognized as an important tool for the prevention of diseases in developed countries (Haskell, 2003; Mckechnie and Mosca, 2003; Monyeki, 2006). Physical performance ability is commonly referred to as physical fitness, an umbrella concept covering a series of qualities related to how well an individual performs physical activity (Astrand et al., 2003). Physical activity is defined as any body movement produced by skeletal muscles resulting in energy expenditure (EE)

(Lefevre et al., 2002). It is thus clear that EE during physical activity represents the most important source of variation in the average daily metabolic rate between individuals (Lefevre et al., 2002).

The findings that dance performers and yoga practitioners have different levels of physical fitness in anaerobic ability (Speed), arm strength, endurance and pulse rate, agree with previous literatures (Prista et al., 1997, 2000; Benefice, 1993; Monyeki et al., 2003; Pate et al., 2006; Baquet et al., 2006; Mikkelsson et al., 2006). Whether the results of the present assessments of these fitness variables are judged to be poor, fair, good or excellent (on the basis of some standards and norms), they are manifestations of the physical activity levels. Enhanced fitness performance mostly reflects the level of habitual physical activity. Indeed, studies in children have indicated that high physical fitness scores, especially high levels of cardiorespiratory fitness, are associated with increased levels of physical activity (Bailey, 1973; Huang and Malina, 2002). However, a significant amount of fitness is explained by heredity (Bouchard et al., 1992). This accounts for less than 30% of the differences between people (Bouchard et al., 1988).

The significant importance of these physical performance measures is related to the development of gross motor skills, improved quality of life and social well-being. Sport activities and physical education classes are essential components of a physical and health-related fitness development. The study fills a research gap by examining an understudied region of the country and by assessing several components of fitness of dance performers and yoga practitioners in Punjab, India. On the other hand, the results of this study will be helpful to the health department, educational planners, future researchers and teachers, etc. in providing awareness about the various ways through which people can maintain good health.

5. Conclusion

The physical variable i.e. speed was found better in dance performers than the yoga practitioners; the probable reason may be that one has to perform dance at a faster pace than yoga. Arm strength was found better in dance performers than the yoga practitioners, and the difference between abdominal strength among dance performers and yoga practitioners was not significant. Endurance was found better in dance performers than the yoga practitioners.

As both the activities are flexibility-based, dance performers and yoga practitioners were found to have equal scores in the flexibility test. The blood pressure of dance performers and yoga practitioners was not significantly different; it was nearly the same in systolic as well as diastolic readings. As we all know, the more endurance one has, the lower the pulse rate becomes; thus, pulse rates were found better in dance performers than the yoga practitioners.

From the above conclusions, it can be generalized that in order to enhance the speed and arm strength of individuals, activities like dance performance can be suggested. Such activities are also advisable for candidates lacking endurance and having blood pressure problems. Yoga and dance both are equally advisable to people who want to increase their abdominal strength and flexibility, and control blood pressure problems. Suitable recommendations for young, adults and old—all age people should be encouraged to participate in such activities, so that everyone can have sound health.

References

Adolph, Edward F. (1974). Some Physiological Regulation Illustrated in Exercise. In Science and Medicine of Exercise and Sports (5th ed.). New York: Harper and Row Publishers, 32, pp. 46-54.

Astrand, P., Podahl, K., Dahl, H. A., & Stromme, S. B. (2003). Textbook of work physiology: physiological bases of exercise (4th ed.). Champaign, Illinois: Human Kinetics.

Bailey, Allison MD. (2009). Menopause and physical fitness. The North American Menopause Society, 16, pp. 856–857.

Bailey, D. A. (1973). Exercise, fitness and physical education for the growing child: a concern. Can. J. Public Health, 64, pp. 421-430.

Baquet, G., Twisk, J. W., Kemper, H. C., Van Praagh, E., & Berthoin, S. (2006). Longitudinal follow-up of fitness during childhood: interaction with physical activity. Am. J. Hum. Biol, 18, pp. 51-58.

Benefice, E. (1993). Physical activity, cardiorespiratory fitness, motor performance, and growth of Senegalese pre-adolescents. Am. J. Hum. Biol, 5, pp. 653-667.

Bouchard, C., Dionne, F. T., Simoneau, J. A., & Boulay, M. R. (1992). Genetics of aerobic and anaerobic performances. In: Holloszy JO (ed) Exercise and sport sciences reviews. Baltimore: Williams and Wilkins, pp. 27-58.

Bouchard, C., Perusse, L., Leblanc, C., Tremblay, A., & Theriault, G. (1988). Inheritance of the amount and distribution of human body fat. Int. J. Obes, 12, pp. 205-215.

Edwin, R. (2000). Effects of a Plyometrics Intervention Programme on Sprint Performance. Journal of Strength and Conditioning Research, 3, pp. 295-301.

Gluch, P. (1993). The use of music in preparing for sport performance. Contemporary Thought, 2, pp. 33-53.

Haskell, W. L. (2003). Physical activity and disease prevention: past, present and future: a personal perspective. Exerc. Sports Sci. Rev, 67, pp. 109-110.

Huang, Y. C., & Malina, R. M. (2002). Physical activity and health-related physical fitness in Taiwanese adolescents. J. Physiol. Anthropol. Appl. Hum. Sci, 21, pp. 11-19.

Johnson, Warren R. and Buskirk, E. R. (1974). Science and Medicine of Exercise and Sports. New York: Harper and Brothers Publications, 21, pp. 26-31.

Karageorghis, C. I., and Terry, P. C. (1997). The psychophysical effects of music in sport and exercise: A review. Journal of Sport Behavior, 2, pp. 54-68.

Lefevre, J., Philippaerts, R., Delvaux, K., Thomas, M., Claessens, A. L., Lysens, R., Renson, R., Vanden Eynde, B., Vanreusel, B., & Beunen, G. (2002). Relation between cardiovascular risk factors at adult age, and physical activity during youth and adulthood: the Leuven Longitudinal Study on Lifestyle, Fitness and Health. Int J Sports Med, 23, pp. 32-38.

Lucaccini, L. F., and Kreit, L. H. (1972). Music. In Ergogenic Aids and Muscular Performance (Ed. W. P. Morgan). New York: Academic Press, 63, pp. 240-245.

Mckechnie, R., & Mosca, L. (2003). Physical activity and coronary heart disease: prevention and effect on risk factors. Cardiol. Rev, 11, pp. 21-55.

Mikkelsson, L., Kaprio, J., Kautiainen, H., Kujala, U., Mikkelsson, M., & Nupponen, H. (2006). School fitness tests as predictors of adult health-related fitness. Am. J. Hum. Biol, 18, pp. 342-349.

Monyeki, M. A. (2006). Health and physical fitness status of rural primary school children living in Ellisras, South Africa: The Ellisras Longitudinal Study (Unpublished Doctoral Thesis). Vrije Universiteit, Amsterdam, The Netherlands.

Monyeki, M. A., Kemper, H. C. G., Twisk, J. W. R., & Monyeki, K. D. (2003). Anthropometric indicators of nutritional status and physical fitness of Ellisras rural primary school children, South Africa. Med. Sportiva, 7, pp. E93-102.

Morehouse, Laurence E. and Miller, Augustus T. (1976). Physiology of Exercise. St. Louis: The C.V. Mosby Company, 56, pp. 5-12.

Pate, R. R., Wang, C. Y., Dowda, M., Farrell, S. W., & O'Neill, J. R. (2006). Cardiorespiratory fitness levels among US youth 12 to 19 years of age: findings from the 1999-2002 National Health and Nutrition Examination Survey. Arch. Pediatr. Adolesc. Med, 160, pp. 1005-1012.

Peter, Arnold. (1972). Education, Physical Education and Personality Development. London: Heinemann, Educational Books Ltd, 72, pp. 114-121.

Prista, A., Marques, A. T., & Maia, A. J. R. (1997). Relationship between physical activity, socio-economic status, and physical fitness of 8-15 years old youth from Mozambique. Am. J. Hum. Biol, 9, pp. 449-457.

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