8 - DERMATOGLYPHIC, SOMATOTYPICAL AND BASIC PHYICAL QUALITIES PROFILE OF CLASSIC DANCERS FROM RIO DE JANEIRO MUNICIPAL THEATER DANCING COMPANY

TATIANE CÉSAR ESCOBAR ; MIRTES SOARES; JOSÉ FERNANDES FILHO
Universidade Castelo Branco, Rio de Janeiro, Brasil.
tatiane.escobar@oi.com.br

INTRODUCTION

Classic ballet is a dance that depends on high level techniques (GÓMEZ, 2004), demanding, thus, practitioners with natural physical capacity for the classic technique (VIEIRA, 2002). According to Orsanova (1987, apud FERNANDES FILHO, 1997) elite athletes of each sports modality are considered as a very selected group, which possess, from a biomechanical point of view, the best physical structure for their modality; thus, describing the dermatoglyphic, and somatotypical profile and the basic physical qualities force, flexibility, balance and coordination of dancers of the MTRJ, icons of the national ballet, would be a selective tool beginning a scientific follow-up of the future generations and correlating the physical preparation to the technique and the art.

The importance of establishing profiles in high performance modalities leads to better training strategies (DANTAS, P., 2001), once "the use of the previous knowledge about the capacities and genetic trends, along with fenotypical contribution, may contribute, not exclusively for the determination of the talent, but, also, with sufficient probability, for its development" (FERNANDES FILHO, 1997). Thus, the research used dermatoglyphy for the study of the genetic characteristics, Latin dermo, meaning "skin" and from the Greek word glypha, "to record"; term created by Cummins and Midlo, in April, 1926, 42º Annual Session of the Association of Anatomists, classified by the method of the study of the cutaneous relief (DOS ANJOS et al, 2003).

The parameters of the dermatoglyphy of the simplest and more accessible fingers for the recognition are the drawings in the distal phalanxes. According to Pável (2004), the majority of the authors distinguish three groups of drawings: Arc (A), Fastener (F) and Verticilo (W). The form of the drawing constitutes a qualitative characteristic, the amount of lines of the cristae of the skin (QL), the sum of the total amount of lines (SQTL) and the amount of cutaneous cristae inside of the drawing represents quantitative characteristics. The simplest drawing is the Arc and the most complex is Verticilo (ABRAMOVA, 1995). Pável (2004) points to the detail that the drawing of arc (A) is more observed in fingers II and III, verticilo in fingers I and IV and fastener in fingers V and III. According to Sampaio et al. (2003), the evaluation of the intensity of the drawings is done from the presence of deltas, and it is calculated, thus, the so-called index of deltas (D10), that can be at the very least be "0" and in maximum "20", considering that for the tabulation of the data the following classification: the arc is "0", Fastener "1", and Verticilo, and S-drawing "2".

The process of evaluation of the basic physical qualities force, coordination, flexibility and balance, that are the most used qualities in dance, according to theoretical references cited by Fagundes and Corazza (2003) and Fernandes Filho (1997) as necessary to high performance sport, are essential, once the process of evaluation of the physical qualities is of great importance in taking decisions, for it's the basis of each program, and for having as an objective the improvement of individual or general levels of physical condition (KLEIN and FERNANDES FILHO, 2003).

The somatotypical evaluation (Heath and Carter´s method) allows a refined study on the adjusted physical type for each sports modality, being a spread out and well accepted method for all scientific society (PÁVEL & FERNANDES FILHO, 2004).

Fingerprints, along with somatotype and physical qualities, will serve as indicators of the main parameters of motor skills and for the ballet, in this case, will serve as a means of classification. However, Hugel (1999) warns that this is only one of the ways of classifying a dancer; one should be very careful with such a modality with many artistic components and forms of art, and it´s not possible to define what separates the good ones from the best ones, once the dancers are artists at first, but athletes seeking for their best and depending on an effective physical training.

The present aims to identify the dermatoglyphic, somatotypical and the basic physical qualities characteristics from dancers

METHODOLOGY

It´s a descriptive research *ex post facto*, which uses a profile tipology, which, according to FLEGNER and DAYS (1995 p. 60): "it is used to show some standards of characteristics". The population of this study was 29 classic dancers of the dancing company of the Municipal Theater of Rio De Janeiro, which shelters the Brazilian icons of the classic ballet and is considered the elite of the national ballet.

The present work was according to the "Norms of Accomplishment of Research in Human Beings", Resolution N° 196/96, of the National Health Council, 10/10/96 (BRAZIL, 1996), with the research project being approved by the Committee of Ethics in Research Involving Human Beings of Castello Branco University (UCB-RJ), under the number 197/02.

PROTOCOLS

The definition of somatotype according to Carter & Heath (1990). For the evaluation of the physical qualities (force, coordination, balance and flexibility) the following tests were used: Explosive force of the inferior members: Jump Test (FERNANDES FILHO, 2003). Force of superior members: Dynamometry (PITANGA, 2005). Coordination: Test of Burpee. Balance: Stork Test - Iowa-brace test. Flexibility: goniometry (DANTAS, 1997). In goniometry the following joints were measured: shoulder (flexion and abduction), hip (Flexion of hip and abduction of inferior members) and ankle (dorsal and plantar Flexion).

For the collection of fingerprints the Protocol from CUMMINS & MIDLO, 1961 was used. The method in the present research includes the processing and posterior attainment of the fingerprints. Fingerprints were collected using a special cushion for fingerprints (COLLECTING IMPRESS) to dirty all the area of each finger´s distal phalanxes. The phalanxes have to be covered with ink on the surface and on the sides up to the nails. After that, the phalanx is immediately pressed against the paper and it is rotated through its longitudinal axle, taking care not to splodge the impression. This process is repeated, with each one of the fingers, starting with the minimum (5) and finishing with the thumb (1).

After the attainment of the fingerprints, there was the preliminary process of its reading, whose standard method is the following:

1) The drawings in the distal phalanxes of the fingers of the hands:

Arc "A" - drawing without deltas - is characterized for the absence of deltas, and is composed of cristae, which cross,

transversally, the digital cushion.

Fastener "L" - drawing of a delta, - there is a delta. It is a drawing, a little closed, where the cristae of the skin start in an extremity of the finger, make a curve, in relation to the other, but without approaching where they begin. The Fastener - an open drawing.

Verticilo "W" - drawings of two deltas - contains two deltas. It´s a closed figure, where the central lines are concentrated, around the nucleus of the drawing.

S-drawing - the drawing of two deltas - which constitutes two linked fasteners, forming an S.

2) - Amount of lines (QL) - the amount of lines of the cristae of skin, inside of the drawing, is counted, according to the line that binds the center of the drawing to the delta and, without taking into consideration the first and the last line of the crista.

Statistics

The use of descriptive statistics techniques aimed to characterize the searched sample universe. For description of the collected data the following values were used: mean, dispersion (standard deviation and standard error) and distribution (asymmetry and curtose). Data were normatized and plotted in a radar graph.

PRESENTATION AND DISCUSSION OF THE RESULTS

Table 1: Descriptive values: age (years), body mass-BM (Kg) and height (cm); (n male=29) (n female=31).

	Male	Female	Male	Female	Male	Female
	Idade	Idade	M.C.	M.C.	Height	Height
)	35,5	30,7	66,6	46,4	174,5	162,3
	9,70	8,04	4,92	4,45	5,65	4,34
m	22,00	21,00	59,00	40,00	166,00	153,00
um	57,00	52,00	75,00	59,00	187,00	173,00

In this table a difference of two decades between the dancers can be observed showing that age is not a limiting factor in ballet but the experience technique contributes very much for the group. In body mass, the shown amplitude was 16 kg for men and 19 kg for women, which shows an increase on body mass and also on height.

Table 2. Descriptive values of somatotypical characteristics; (n Male=21) (n Female=31).

	Male	Female	Male	Female	Male	Female
	Endo	Endo	Meso	Meso	Ecto	Ecto
Mean)	2,4	2,5	3,7	1,5	3,0	4,5
	0,89	0,66	0,74	1,20	0,58	0,89
nimum	0,78	1,59	2,51	0,13	1,49	2,22
ximum	4,24	4,53	5,64	-0,42	4,48	6,02

As to somatotype, the paper from Gómez (2005) clarifies that dancers normally have a thin body, presenting an exaggerated ectomorph somatotype.

In this study, men have presented a meso-ectomorph characteristic, while women showed ecto-endomorph characteristics, showing similarities to the study above.

Table 3. Descriptive values of dermatoglyphic characteristics (D10 and SQTL); (n Male =29) (n Female= 31).

	Male	Female	Male	Female
	D10	D10	SQTL	SQTL
	15,5	15,6	135,2	122,9
	2,47	2,78	28,59	41,36
mum	10,00	10,00	77,00	33,00
mum	19,00	19,00	189,00	191,00

Table 4. Descriptive values of the dermatoglyphic characteristics (D10 e SQTL); (n Male =29) (n Female= 31).

Male	Female	Male	Female	Male	Female
A	A	L	L	W	W
0,4%	0,3%	44,1%	43,5%	55,5%	56,1%

Base don national studies on dermatoglyphic profiles in other physical activities (DOS ANJOS, M.A.B.; FERNANDES FILHO, J. & NOVAES, J.S., 2003; SAMPAIO, A.O.; DANTAS, P.M.S.; FAZOLO, E.; FERNANDES FILHO, J, 2003; DOS SANTOS, M.R. & FERNANDES FILHO, J, 2004; PINHEIRO-Da CUNHA, R.S. & FERNANDES FILHO, 2004), mean of SQTL and D10 of the Male and Female groups is considered high. The absence of an arc (A) and the predominance of verticilos (W), shows a high performance characteristic (FERNANDES FILHO, 1997).

The rise in the index of SQTL and D10 points to coordination and resistance, adjusting to the requirements of ballet, an activity of great motor and proprioceptive complexity (GÓMEZ, 2005).

The descriptive measures of the sum of the amount of lines of the two hands present a standard of similar behavior, differentiating only from the third to the fourth masculine finger, as it can be seen below:

Male left hand: 1°finger< 2° finger > 3° finger > 4° finger < 5° finger

Male right hand: 1°finger< 2° finger > 3° finger < 4° finger < 5° finger

Female left hand: 1°finger< 2° finger > 3° finger < 4° finger < 5° finger

Female right hand: 1°finger< 2° finger > 3° finger < 4° finger < 5° finger

This standard behavior may form one of the characteristics of ballet, once common points between fingerprints and the sports modality reflect a biological natural law between the genetic marks and the congenital aptitudes (ABRAMOVA et al, 1995).

Table 5. Descriptive values of the physical qualities manual force - dynamometry (Kg), coordination - burpee test (repetition) and strength of inferior members -jump test (cm); (n Male=29) (n Female=31).

Male	Male	Male	Feminio	Male	Female
Dyn-right kg	Dyn-left kg	Burpee	Burpee	Jump Test	Jump Test
42,5	43,8	6,6	6,0	56,9	38,1
7,55	6,92	0,62	0,71	8,72	5,92
32,00	32,00	6,00	4,00	40,00	29,00
59,00	61,00	8,00	7,00	71,00	56,00

Table 6. Descriptive values of the physical quality flexibility - goniometry (grades); (n Male=29) (n Female=31).

	X	S	Min	Max
Abd-shoulder.male.	204,6	12,20	185,00	232,00
Abd- shoulder.fem.	217,5	12,96	190,00	245,00
Flex- shoulder.male	141,3	11,03	115,00	170,00
Flex- shoulder.fem.	142,2	9,69	102,00	152,00
Flex-hip male	151,1	15,84	115,00	175,00
Flex- hip female	163,0	11,09	137,00	176,00
Flex-dor male.	12,4	7,52	1,00	30,00
Flex-dor female.	13,2	9,42	0,00	28,00
Flex-pla male.	72,9	11,76	15,12	93,00
Flex-pla female.	77,4	11,78	52,00	96,00
Abd-mi male.	161,3	32,14	110,00	240,00
Abd-mi female.	182,8	30,04	130,00	240,00

Based on Dynamometry Table (FERNANDES FILHO, 2003) the results of the right and left hands, respectively, show a weak and regular performance according to Corbins and cols Table (1978, in PITANGA, F., 2005), showing a necessity of a more specific strength training of superior members to dancers, once they raise other dancers either on presentation and on rehearsals. (ADRIANO:CARNELOZZI, 2006).

As to the strength of inferior members, measured by the Jump Test (FERNANDES FILHO, 2003), it reached a result next to 70% of the maximum performance for men and 90% for women, according to table of Montaye, H.J. (1988 apud FERNANDES FILHO, 2003), and this good result demonstrates the good preparation of the dancers in relation to the force of the inferior members, which is of great importance for the optimization of the technical gesture, in the search of the use of bolder and gracious choreographic movements (SOARES et al, 2005).

The evaluation of male and female coordination through Burpee Test showed median results, once results in other physical activities (SAMPAIO, A.O. et al, 2003; di GESU FREITAS, R. & FERNANDES FILHO, 2004; DOS SANTOS, M.R. & FERNANDES FILHO, 2004) ranged from 5,80 to 10,56.

In the physical quality balance, everybody could finish the test Iowa Brace successfully, showing corporal control, a characteristic that guarantees the dancer the capacity of recovering from final positions, therefore a necessary physical quality to high performance (MENDES, J. 2005).

According to some international standards of goniometry, as the American Medical Association, Hoppenfield (DANTAS, E. 2005) among others, the averages of the group in relation to flexibility in all the joints exceed too much the normal standard, characterizing the dancers as hyper-flexible. Women had presented superior results in relation to men, characterizing that the women withhold more flexibility in relation to men (DANTAS, E. 2005).

Flexibility, among others, is a very important capacity when training dancers, if it´s well developed, improves the performance of the techniques of the movements, collaborating with good results on flexibility, which demonstrates a group with good physical performance (DOS SANTOS, F.G. 2005).

CONCLUSIONS

This study showed that the analyzed group presented satisfactory results in relation to body composition, characterizing it as meso-ectomorphs (men) and ecto-endomorphs (women), which reachs the necessities of the classic ballet, in relation either to aesthetics, and technique of the movement. In relation to the dermatoglyphy test, the results present high index of SQTL and D10, which improves the somato-functional levels of resistance and coordination and that, along with the predominance of verticilo (W) and the absence of arc (A), discloses a group with a high standard of professional excellence.

In the tests of physical qualities, the good results on inferior members demonstrated a good preparation for this important capacity for dancers, as they are exposed to a great load of work in the inferior members, especially during the impulse (CIGARRO et al, 2006). As to the test of manual force, the results were not good, showing the necessity of improving this quality through specific workouts, once in ballet, men need strength in the arms to raise their partners which are exhaustively repeated during rehearsals, seeking perfection during the presentations. Below the expected result, the test of motor coordination reached median values, if compared to other studies with athletes from other physical activities. As to the balance test, it was agreat success, showing the corporal control of the group. As to flexibility, dancers showed levels much beyond the normal standard, characterizing themselves as a hyper-flexible group reaching the demands of the technical requirements of the modality, for flexibility enhances and favors learning, practice and performance of a movement (ALLI, 2004), thus it´s essential for the movements in ballet.

It is believed that this study helped to develop the knowledge of the practitioners of the classic ballet, under a lot of aspects, from functional to genetic ones, helping to establish more successful strategies for training and selection, because of the increased number of information from the dancers and contributing with research that need parameters for high performace formation in national ballet.

It is suggested that this research be continued to complement what couldn´t be analysed here, so that we can have a better performance in ballet, such as studies involving superior members strength in women.

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Av. Olegário Maciel 45,ap.203- Barra da Tijuca Rio de Janeiro/ Cep: 22620171
tatiane.escobar@oi.com.br
Tel: 2495-3714

DERMATOGLYPHIC, SOMATOTYPICAL AND BASIC PHYICAL QUALITIES PROFILE OF CLASSIC DANCERS FROM RIO DE JANEIRO MUNICIPAL THEATER DANCING COMPANY

Classic ballet is an erudite modality of dance that, with its evolution, began to demand a strong physical preparation and, along with this, the necessity of a best knowledge of its practitioners. The aim of this study is to identify the basic physical qualities and the dermatoglyphic and somatotype profile of 29 dancers of the Municipal Theater of Rio de Janeiro (MTRJ), age ranging from 35,9 10,30. Dermatoglyphic characteristics (Cummins and Midlo, 1961), somatotypical characteristics (Heath and Carter, 1990) and the basic physical qualities have presented, respectively, the following results: arc (A) 4,0%, fastener (F)

44,1%, verticilo (W) 55.5%, D10 X = 15,5 2,47 SQTL X = 135,2 28,59; ectomorphy X = 3 0,58; mesomorphy X = 3,7 0,74; endomorphy X = 2,4 0,89; coordination (Test of Burpee-Mathews Donald, K. 1980) X= 6,6 rep 0,62; manual force (Dynamometry-Pitanga, Francisco, 2005): right hand X = 42,5 kg 7,55; left hand X = 43,8 kg 6,92; legs explosive force (Jump Test-Fernandes Filho, 2003) X = 56,9 cm 8,72; flexibility (goniometry-Dantas, H., 2005): shoulder abduction X = 204,6º 12,2; shoulder flexion X = 141,3º 11,03; hip flexion X = 141,3º 11,03; dorsiflexion X = 141,3º 11,03; plantar flexion X = 141,3º 11,03; hip abduction X = 141,3º 11,03. The Balance Test (stork test Donald-Mathews, K., 1980) was carried through successfully with all the subjects. Future studies are necessary so as to increase the knowledge of cassic ballet´s practitioners.

Keywords: dermatoglyphy; somatotypical; ballet; basic physical qualities.

PROFIL DERMATOGLYPHIQUE, SOMATOTYPE ET QUALITÉS PHYSIQUES DE BASE DES DANSEURS DU CORPS DE BALLET DU THÉÂTRE MUNICIPAL DE RIO DE JANEIRO

Le ballet classique est une modalité érudite de la dance dont l'évolution exige à présent une préparation physique de haut niveau, d'où le besoin d'une connaissance plus approfondie de ses adeptes. L'objectif de cette étude est d'identifier le profil dermatoglyphique, somatotype et les qualités physiques de base de l'ensemble des 29 danseurs du Théâtre Municipal de Rio de Janeiro (TMRJ), âgés de X = 35,9 ± 10,30. Les caractéristiques de dermatoglyphie (Cummins et Midlo, 1961), de somatotype (Heath et Carter, 1990) et des qualités physiques de base ont donné les résultats suivants, respectivement : cambrure du pied (A) 4,0 %, longueur (L) 44,1 %, largeur (W) 55,5 %, D10 X = 15,5 ± 2,47 SQTL X = 135,2 ± 28,59 ; ectomorphie X = 3 ± 0,58 ; mésomorphie X = 3,7 ± 0,74; endomorphie X = 2,4 ± 0,89 ; coordination (Test de Burpee-Matthews Donald, K. 1980) X= 6,6 rep ± 0,62 ; force de préhension manuelle (Dynamométrie-Pitanga, Francisco, 2005): main droite X = 42,5 kg ± 7,55 ; main gauche X = 43,8 kg ± 6,92 ; force explosive des membres inférieurs (*Jump Test*-Fernandes Filho, 2003) X = 56,9 cm ± 8,72 ; flexibilité (goniométrie-Dantas, H., 2005) ; abduction de l'épaule X = 204,6° ± 12,2 ; flexion de l'épaule X = 141,3° ± 11,03 flexion de la hanche X = 141,3° ± 11,03; flexion dorsale X = 141,3° ± 11,03 ; flexion plantaire X = 141,3° ± 11,03 ; abduction des membres inférieurs X = 141,3° ± 11,03. Tous ont réussi le test d'équilibre (test de la cigogne-Matthews Donald, K., 1980). De futures études du ballet seront nécessaires pour étendre davantage encore les connaissanes concernant les danseurs.

Mots clés : dermatoglyphie ; somatotype ; ballet ; qualités physiques de base.

PERFIL DERMATOGLÍFICO, SOMATOTÍPICO Y DE LA CALIDAD FÍSICA BÁSICA DE LOS BAILARINES INTEGRANTES DEL CUERPO DE BAILE DEL TEATRO MUNICIPAL DE RÍO DE JANEIRO

El ballet clásico es una modalidad erudita del baile que, con su evolución, pasó a exigir una preparación física de alto nivel y, con esto, una necesidad de un mejor conocimiento de parte de sus practicantes. El objetivo de este estudio es identificar el perfil dermatoglífico, somatotípico y de la calidad física básica de la población de 29 bailarines integrantes del Teatro Municipal de Río de Janeiro (TMRJ), con una edad promedio X = 35,9 10,30. Las características de Dermatoglifia (Cummins y Midlo, 1961), Somatotipia (Heath y Carter, 1990) y de la calidad física básica mostraron los siguientes resultados, respectivamente: Arco (A) 4,0%, presilla (L) 44,1%, verticilo (W) 55,5%, D10 X 15,5 2,47 SQTL X 135,2 28,59; ectomorfia X 3 0,58; mesomorfia X 3,7 0,74; endomorfia X 2,4 0,89; coordinación (Prueba de Burpee-Mathews Donald, K. 1980) X 6,6 resp 0,62; fuerza de aprehensión manual (Dinamometría-Pitanga, Francisco, 2005): mano derecha X 42,5 kg 7,55; mano izquierda X 43,8 kg 6,92; fuerza explosiva de miembros inferiores (Jump Test-Fernandes Hijo, 2003) X 56,9 cm 8,72; flexibilidad (goniometría-Dantas, H., 2005): abducción de hombro X 204,6º 12,2; flexión de hombro X 141,3º 11,03 ; flexión de cuadril X 141,3º 11,03; flexión dorsal X 141,3º 11,03 ; flexión plantar X 141,3º 11,03; abducción de miembro inferior X 141,3º 11,03. La prueba de Equilibrio (prueba cigüeña - Mathews Donald, K.,1980) fue realizado con éxito por todos. Serán necesarios futuros estudios sobre el ballet, para contribuir a la ampliación de los conocimientos de sus practicantes.

Palabras-claves: dermatoglifia; somatotipia; ballet; calidad física básica.

PERFIL DERMATOGLÍFICO, SOMATOTÍPICO E DAS QUALIDADES FÍSICAS BÁSICAS DE BAILARINOS ATUANTES DO CORPO DE BAILE DO TEATRO MUNICIPAL DO RIO DE JANEIRO

O balé clássico é uma modalidade erudita de dança que, com sua evolução, passou a exigir uma preparação física de alto nível e, com isso, a necessidade do melhor conhecimento dos seus praticantes. O objetivo deste estudo é identificar o perfil dermatoglífico, somatotípico e das qualidades físicas básicas da população de 29 bailarinos atuantes do Teatro Municipal do Rio de Janeiro (TMRJ), com idade de X 35,9 10,30. As características de dermatoglifia (Cummins e Midlo, 1961), somatotipia (Heath e Carter, 1990) e das qualidades físicas básicas apresentaram os seguintes resultados, respectivamente: arco (A) 4,0%, presilha(L) 44,1%, verticilo(W) 55,5%, D10 X 15,5 2,47 SQTL X 135,2 28,59; ectomorfia X 3 0,58; mesomorfia X 3,7 0,74; endomorfia X 2,4 0,89; coordenação (Teste de Burpee-Mathews Donald, K. 1980) X 6,6 rep 0,62; força de preensão manual (Dinamometria-Pitanga, Francisco, 2005): mão direita X 42,5 kg 7,55; mão esquerda X 43,8 kg 6,92; força explosiva de membros inferiores (Jump Test-Fernandes Filho, 2003) X 56,9 cm 8,72; flexibilidade (goniometria-Dantas, H., 2005): abdução de ombro X 204,6º 12,2; flexão de ombro X 141,3º 11,03 ; flexão de quadril X 141,3º 11,03; flexão dorsal X 141,3º 11,03 ; flexão plantar X 141,3º 11,03; abdução de membro inferior X 141,3º 11,03.O teste de Equilíbrio (teste cegonha-Mathews Donald, K.,1980) foi realizado com sucesso por todos. Futuros estudos no balé são necessários para contribuir para a ampliação de conhecimentos a respeito do seu praticante.

Palavras-chave: dermatoglifia; somatotipia; balé; qualidades físicas básicas.