

Morpho-anthropometric profile of Igbabonelimhin acrobatic dancers of Esan community in Edo State, Nigeria

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Abstract. The aim of this study was to identify the Morpho-anthropometric profile of Igbabonelimhin acrobatic dancers in Esan community, Edo State. Morpho-anthropometric indicators of age, weight, height, body mass index (BMI), visceral fat and Body Fat Percentage were determined. A Cross-Sectional study involving twenty four (24) acrobatic dancers participated in the study which were drawn purposively. The data were analysed using descriptive statistics of frequency counts and percentage for all the variables and Pearson's Correlation Coefficients (r) to assess the link and the degree of relation between them. The Results showed a BMI categorization of Normalcy indicating 75%, Underweight, Overweight and Obesity indicating 8.3% each while the Visceral Fat level categorization for ages 1-9 showed 83.3% indicating 0(Normal), ages 10-14 and 15-30 indicating 8.3% for both + (High) and ++ (Very High) respectively. Body Fat Percentage for ages 20-39 indicated 100% 0(Normal), ages 40-59 indicating 50% 0(Normal) and 16.6% for -(Low), + (High) and ++ (Very High) respectively. Ages 60-79 indicated 66.7% 0(Normal) and 33.4% + (High). It also showed a significant correlation between the weight of acrobatic dancers on the height, BMI, Body Fat Percentage, Visceral Fat and no correlation between the ages of the acrobatic dancers on height, weight, BMI and percentage fat. Age and height also showed a negative correlation. BMI of the acrobatic dancers showed a positive significant correlation with Percentage Body Fat, Visceral Fat and their weight. It was

concluded that Igbabonelimhin acrobatic dancing is a good physical exercise to develop and maintain good morpho-anthropometric profile. It is therefore recommended that continuous maintenance of healthy lifestyle and body composition among such acrobatic dancers should be ensured or encouraged.

Keywords. Acrobatic dancers, BMI, body fat percentage, height, Igbabonelimhin, visceral fat.


Introduction

For dance to be possible, one must make either locomotor or axial movement, or both. In dance movements therefore, the body serves as a tool for self-expression laying credence to the fact that all body movements tend to be rhythmic. According to Harris et al. (1968), "rhythm, both external and internal, is the well spring from which dance, and its twin sister, music arise; when the inner rhythm are overtly synchronized in movement and gesture with the thousands of patterned sounds of nature, man-the mimic-begins to dance". This is why it has always been natural for people to move to the beat of music or other accompaniments.

Acrobatics is the performance of extraordinary feats of balance, agility, and motor coordination (Western Cape Gymnastics Association, 2016). It can

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be found in many of the performing arts as well as in many sports events, and martial arts. Acrobatics is most often associated with activities that make extensive use of gymnastic elements, such as acrobatic dance, circus, and gymnastics. Acrobatic dance is physically demanding and requires years of training to not only teach safely, but also to advance in it (Koutedakis & Sharp, 1999).

Igbabonelimhin acrobatic dance often referred to as the Esan dance comprises several cultural dancers performing as a group. It symbolizes a focal point of the Esan community cultural heritage of Edo State, Nigeria (Esan Magazine, 2012). The Igbabonelimhin acrobatic dancers perform incredible somersaulting, mid-air twisting and breathtaking deft footworks to drum beating, hand clapping and vocal performances. Acrobatic dances practiced at high professional level require the body to perform artistically and aesthetically at top capacity as far as physical conditioning has been considered. It can be assumed that the quantification of morphological characteristics and anthropometric measurements of acrobatic dancers can be a key factor in relating body structure to dance performance.

Therefore, acrobatic dancer's morpho-anthropometric characteristics, which include weight, height, Body Mass Index (BMI), percentage body fat and visceral fat represent an important prerequisite for successful participation in folk dance (Mi-Young et al., 2013). In addition, the importance of low body fat, low waist-to-hip and waist-to-thigh circumference ratio in dancers is universally accepted as it is well known that body height influences positively all body segment lengths and, in turn, dance performance (Koutedakis & Jamurtas, 2004; To et al., 1997). Several studies examined profiles of anthropometric characteristics, body composition and somatotype of dancers, particularly in relation to their performance level (Yannakoulia et al., 2000; Hergenroeder et al., 1991). Furthermore, the majority of studies in dance science research have been examining the physiological variables and fitness of dancers, especially focusing on ballet

dancers (Pekkarinen et al., 1989; Schantz & Astrand, 1984).

Specifically, the present study is concerned with identifying indigenous morpho-anthropometric profile of acrobatic dancers. Unfortunately, this search has not gained much attention in Nigeria. This present study is an attempt to explore this missing link in our rich cultural heritage of folk dance. The study was therefore designed to investigate the morpho-anthropometric profile of one of the folk acrobatic dance, "Igbabonelimhin". It is hoped that the data generated will provide essential eye-opener and feedback to dance trainers, coaches and researchers as regards insight on their morpho-anthropometric profile.

The following research questions were raised to guide the study: 1) What are the categories of BMI among Igbabonelimhin acrobatic dancers of Esan, Edo state? 2) What are the values of Body Fat Percentage among Igbabonelimhin acrobatic dancers of Esan, Edo state? 3) What are the values of visceral fat among Igbabonelimhin acrobatic dancers of Esan, Edo state? 4) Will there be a correlation between height, BMI, Body Fat Percentage, visceral fat and body weight of Igbabonelimhin acrobatic dancers of Esan, Edo state?

Methods

This study employed a descriptive survey and cross-sectionally conducted twenty four (24) apparently healthy acrobatic dancers aged 35-68years which were randomly drawn from Esan, Edo State. The total population of the Igbabonelimhin acrobatic dancers of Esan, Edo State were purposively selected for the study.

Morpho-anthropometric Measurements

Height was measured using a calibrated wall. In taking the height, the acrobatic dancers were made to stand straight with their shoes off and the trunk held erect such that the external auditory meatus and the lower border of the eye were in one horizontal plane (Frankfurt plane). The buttocks, shoulder

blades, and heels touched the wall scale with knees and legs together and arms hanging naturally by the side. A movable headboard was brought against the crown of the head and height measurement read off at maximum inspiration to the nearest centimetre.

Weight, BMI, Body Fat Percentage, Visceral fat were measured using a well calibrated, portable OMRON BF508 Body Composition Monitor. The acrobatic dancers were weighed standing on the OMRON machine. They were lightly dressed without their dancing attire on; dancing shoes, stockings, cap, sweater or cardigan and all pockets were emptied out. This was to maintain uniformity and respect of the acrobatic dancers. The acrobatic dancers were asked to stand with their knees and back straight, looking straight-forward and their arm were horizontally raised, elbows extended straight and the arms straight at a 90angle to the body. Also, the acrobatic dancers were asked to press their palms firmly on the grip electrodes and to hold the display unit of the OMRON for proper display. The OMRON was checked before each measurement and zero adjusted was effected for standardization according to OMRON BF508 Body Composition Monitor Instruction Manual. After proper inputs, the dancers mounted the OMRON and the vital variables were displayed.

All measurements were taken twice by one of the investigators and a trained assistant. The average (mean) of the two measures was used for the analysis.

Validity of the Instrument

The Instruments have been validated by the International Society for the Advancement of Kinanthropometry (ISAK, 2001). However, in order to ascertain whether the instruments were testing what they were designed to test in our locality, their suitability was confirmed by three experts in Exercise Physiology and Kinanthropometry.

Reliability of the Instrument

The reliability of the instrument was effected through a one-shot administration on 10 participants that did not participate in the main study. The Split-halves technique using even and odd numbered items with Cronbach Alpha technique yielded a coefficient of 0.76 relationship.

Method of Data Analysis

The data from tables 1, 2 and 3 were analysed using descriptive statistics of frequency counts and percentages for all the variables, while the data from table 4 were analysed using Pearson's Product Correlation Coefficients (r), which were calculated to assess the link and the degree of relation between BMI, Body Fat Percentage, Visceral Fat in relation to age variables. The statistical software package IBM Statistics SPSS 20 for windows was used for the statistical analysis. The Alpha level was significant at ($p < 0.05$).

Results

The results are presented in Tables 1 – 4. The study was aimed at assessing the Morpho-Anthropometric Profile of Igbabonelimhin Aerobatic Dancers of Esan, Edo State.

Table 1

BMI level categorized among the participants.

Normative Value (Numerical)	Normative Value Interpretation	Frequency	Percentage (%)
<18.5	Underweight	2	8.3%
18.5 – 24.99	Normal	18	75.0%
25 – 29.99	Overweight	2	8.3%
>30	Obesity	2	8.3%
Total		24	100%

Table 2

Visceral fat level categorized among the participants.

Visceral Fat Level Benchmark	Visceral Fat Classification	Frequency	Percentage (%)
1 – 9	0 (Normal)	20	83.3%
10 – 14	+ (High)	2	8.3%
15 – 30	++ (Very High)	2	8.3%
Total		24	100%

Discussion

The present study was aimed at investigating the morpho-anthropometric profile of Igbabonelimhin acrobatic dancers of Esan, Edo State of Nigeria.

Table 1 indicates that 8.3% of the acrobatic dancers were underweight, 75% were normal, 8.3% were overweight and 8.3% were obese. Therefore, only 4 (16.6) of acrobatic dancers exhibited risk of

developing health complications. Table 2 indicates that 83.3% of age ranging from 1-9 years were 0(Normal), 8.3% of age ranging 10-14 years were +(Normal) and 8.3% of age ranging from 15-30 years were ++(Very High). Table 3 indicates that 100% of acrobatic dancers between the age range of 20-29 years were 0(Normal) having 8.0-19.9% body fat percentage, 50% of the acrobatic dancers between the age range of 40-59 years were 0(Normal), 16.6% had -(Low), +(High), ++(Very High) levels of Body Fat Percentages. The 60-79 year old dancers were represented by 66.7% normal and 33.4% high percentage body fat. Table 4 indicates the age and height of the acrobatic dancers showing a negative correlation but a positive significant correlation between age and visceral fat. Height showed a correlation with weight. The weight of participants shows a positive significant correlation on the height, BMI, Body Percentage Fat and Visceral Fat of the acrobatic dancers. BMI indicates a correlation with Visceral Fat, Body Fat Percentage, and weight.

Table 3

Body Fat Percentage categorized according to age among the participants.

Age		- (Low)	0 (Normal)	+ (High)	++ (Very High)
20 – 39	Bench Mark	< 8.0%	8.0 – 19.9%	20.0–24.9%	≥ 25.0%
	Frequency	–	6	–	–
	n= 6(100%)	%	(100%)		
40 – 59	Bench Mark	<11.0%	11.0 – 21.9%	22.0–27.9%	≥ 28.0%
	Frequency	2	6	2	2
	n= 12(100%)	%	(16.6%)	(50%)	(16.6%)
60 – 79	Bench Mark	< 13.0%	13.0 – 24.9%	25.0–29.9%	≥ 30.0%
	Frequency	–	4	2	–
	n= 6(100%)	%	(66.7%)	(33.4%)	

Table 4

Correlation of morpho-anthropometric profile among the participants.

		Age	Height	Weight	BMI	Percentage Body Fat	Visceral Fat
Age	r	1	-0.226	0.193	0.292	0.363	0.496
	p		0.288	0.366	0.166	0.081	0.014*
	n		24	24	24	24	24
Height	r		1	0.462	0.180	0.047	0.051
	p			0.023*	0.400	0.829	0.814
	n			24	24	24	24
Weight	r			1	0.954	0.875	0.882
	p				0.000*	0.000*	0.000*
	n				24	24	24
BMI	r				1	0.957	0.964
	p					0.000*	0.000*
	n					24	24
Percentage Body Fat	r					1	0.956
	p						0.000*
	n						24

* Correlation is significant at the 0.05 level (2-tailed).

The results revealed that a higher number of the Igbabonelimhin acrobatic dancers had a normal level for BMI categorization. This implicates that majority of the acrobatic dancers are not predisposed to health complications like Type II diabetes, abdominal obesity and other health challenges. This also directly potentiates a positive implication in enhanced performance among the acrobatic dancers. It also fosters proper co-ordination and skill performance during acrobatic activities. The findings of this study were similar to Jose et al. (2014) who studied Spanish dancers and Mi-Young et al. (2013) who examined traditional Korean college dancers which showed normal level of BMI. However, it differed from that of Liiv et al. (2013) who compared body figures based on dance styles which showed a higher level of BMI. This disparity could be due to the gender differences and dancing styles employed by the female dancers in their study.

The second concern of the study was focused on assessing Body Fat Percentage. The result portrayed that the acrobatic dancers had a 0(Normal) level for age ranging between 20 – 39years. For ages ranging between 40 – 59years, It portrayed 50% 0(Normal), 16.6% portraying – (Low), + (High) and ++ (Very High) respectively. For ages ranging between 60 –79, it portrayed 66.7% 0 (Normal) and 33.4% portraying + (High). The findings of this study are similar to Mi-Young et al. (2013) and at variance with those of Ferrari et al. (2013) which showed a lower level of Body Fat Percentage. This disparity could be due to their investigation participants involving amateur classical dancers.

The third findings showed that 10% of acrobatic dancers had + (High) and ++(Very High) levels of visceral fat, while above 80% possessed a 0 (Normal) visceral fat level. The health implication is that a higher percentage of acrobatic dancer are not prone to possessing risks of coronary heart disease,

depression, and mood problems/changes. This finding is at variance with Agwubike et al. (2016) results which showed a + (High) and ++ (Very high) level of visceral fat. This disparity may be due to their investigation participants involving early morning fitness promotion club members in which most of the study participants were unexposed to frequent training sessions.

Also, the final findings showed that there is a significant correlation between the age of the participants and their visceral fat level but showed a negative correlation to the participant's height, weight, BMI and percentage body fat. There was no significant correlation between the height of the participants and their BMI, Percentage Body Fat, and Visceral Fat but a significant correlation between heights and weights of the participants. The weight of participants show a positive significant correlation on the height, BMI, Percentage Body Fat and Visceral Fat. The BMI of the participants showed a positive significant correlation with Percentage Fat, Visceral Fat, and the weight of the participants. Percentage Body Fat showed a significant correlation with Visceral Fat, BMI and weight of the participants. These findings are similar to those of Chathuranga et al. (2013) which showed a positive correlation BMI and Percentage Body Fat.

Conclusion

Based on these findings, this study showed a normal level of BMI, Visceral Fat, and Percentage Body Fat were prevalent among the study participants. This, in turn, had a positive implication on health as this may lower their risk of developing cardiovascular disease and enhance their physical fitness level in terms of the health and performance components among the acrobatic dancers. It is also expected to have a positive implication on the ability and mental alertness for performance (both motor and skill) among the acrobatic dancers.

Limited sample size and the number of anthropometric variables were the limitations of this study. However, this study might generate interest

among the future researchers to investigate further into the effect of structured aerobic dance training among dancers.

It is therefore recommended that: 1) Continuous maintenance of healthy lifestyle and body composition among acrobatic dancers should be encouraged. 2) Since healthy body composition changes according to one's age and gender, appropriate active lifestyle and dance promotion guidelines should be followed to avoid unhealthy body composition as one grows and ages.

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