98 - ESTIMATING BODY COMPOSITION IN BIOIMPEDANCE: A STUDY WITH THE POLICE CIA SHOCK MILITARY POLICE PIAUÍ

CLÁUDIA MARIA DA SILVA VIEIRA[1];
GABRIEL VASCONCELOS ASSUNÇÃO[1];
MARA JORDANA MAGALHÃES COSTA[2];
LÍVIA RAQUEL SILVA SOARES[2];
SOLANGE MARIA RIBEIRO NUNES LAGES[2]
1 - INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO PIAUÍ-IFPI, TERESINA, PIAUÍ, BR
2 - UNIVERSIDADE ESTADUAL DO PIAUÍ – UESPI -TERESINA, PIAUÍ, BR
doi: 10.16887/85.a1.98
solangelages@hotmail.com

INTRODUCTION

The constitution of the body is usually expressed as the sum of four basic elements, muscle mass, body fat mass, or fat tissue, muscle and bone mass. The bioimpedance technique is a quick and practical way to evaluate the percentage of all of these tissues that make up the human body method. The balance between the proportions of these body tissues are associated with health, however, the imbalance is associated with diseases.

The military police, while state body has to function and legal duties to promote and ensure public safety. For the exercise of their duties, the police officer must be prepared to meet the new and increasing demands imposed by public security issues as having challenging combat violence and crime (Medeiros, 2011).

Specifically, reports Medeiros (2011), should be provided with technical and tactical to intervene in favor of social resources. Preceding the entire technical and tactical preparation, one should consider that an adequate level of physical fitness by individuals who serve this municipality, is the gradient that creates ideal conditions for the effective realization of any military work so special to the group police officers who compose the BPRONE since they are assignments that require more rigor to its execution thus requires an even more vigorous fitness.

According to the American College of Sports Medicine - ACSM (2007), satisfactory levels of these components are strongly associated with the prevention of various diseases and health promotion, which can be changed through the regular practice of physical exercise.

The exercise of military police activity, to maintain order and compliance with laws in society, it is admittedly stressful and predisposes workers to physical and psychological risks that associated with other risk factors such as poor dietary habits, low levels of physical activity normal and overweight can lead to chronic diseases, particularly cardiovascular (PEREIRA, 2007).

For Pereira (2007), the military classes, body composition and physical fitness component is a determining factor, ie, low levels of physical fitness negatively influence both the entry as the promotional system of military career. Physically active employees are more productive than their sedentary peers.

Body composition is one of the components of physical fitness and interferes directly or indirectly in overall fitness. It is believed that officers who submit the best level of body composition may also show better performance in other items of physical fitness (Guedes e Guedes, 2006).

Body composition by bioelectrical impedance is one of the newest methods to estimate the relative body fat percentage in diverse populations. This method splits the body by means of an electric current that passes through tissue and splits the body into bone, muscle, fat and liquid components (REZENDE et al., 2007).

Assess body composition by bioimpedance technique and physical fitness components of the Company's officers (Cia) Shock Battalion Rounds Chichi Special Natures (BPRONE) of the Military Police of Piauí.

METHODOLOGICAL PROCEDURES

The research was characterized as a field study of quantitative and descriptive transversal character. Quantitative research according to Thomas, Nelson & Silverman (2008) is one that almost always involves precise measurements and statistical analysis. The study was conducted in the city of Teresina-Pi in the period January to July 2014, with the initial sample 31 police officers, male, aged between 20 and 39 years of CIA Shock BPRONE the Military Police of Piauí.

Final sample comprised 20 officers, representing 67% of the men who compose the CIA Shock, for several reasons: a) do not appear on the day of data collection; b) because of health problems and c) by reason of absence at work is related to issues inherent in the work, whether by fulfilling vacation.

Initially the design intent of the research to the 1st Battalion Lieutenant for review and request for authorization of the study was sent. Then performed to invite the police to collect data. First, however, the goals and the importance of the research were explained himself, and only then, those who are willing to participate voluntarily attend the given set for data collection.

Before the start of the application of the tests, all participants signed an informed consent form in two copies, one of which was given to the participant.

The anthropometric variables studied were: Height (m); Body weight (kg) and body composition by bioelectrical impedance method, which classifies the constitution of body fat (% F), muscle mass (MM%), bone (O%) and net fabric (L%).

Socio-behavioral variables in this research were: age, sex, length of police (years), while in CIA shock (months), level of education and practice of systematic exercise.

As for physical exercise, we considered the individual practitioner who accumulated at least three hours a week of exercise systematized.

The height measurements were performed using a digital stadiometer height meter ultrasonic and infrared - W721 WISO, measured in the standing position with his back to the scale of the balance with your feet apart laterally. The look facing forward with the head upright, wearing as little clothing as possible and measured only once.

Measurement of body weight digital scale with stadiometer digital height gauge ultrasonic and infrared - 180 Kg W721 WISO taking your measurement occurred every 10 measurements. The guy climbed on the scales without shoes and stepped into her heart, keeping up straight and looking ahead (Frankfurt plane); It was on reading and annotation, and then was asked to come down to assessing the balance. The measurement transcribed in kilograms.

Body composition was assessed by bioelectrical impedance method using a bipolar digital scale and body analyzer WISO W835, which splits the body constitution into four distinct elements, namely: fat, fluid, muscle and bone. The BIA is an easy and simple method to evaluate the composition and fractionation of the body using an electrical current through the body tissues and predicts the amount of each of these tissues.

For the analysis of body composition assessed placed in the standing position, facing forward looking, extended

alongside the body arms, feet positioned in the center of scale, bare and slightly apart on the scale platform. The testing was wearing as little clothing as possible.

The data analysis was done using descriptive statistics, with data being presented as mean and standard deviation. Treatment through percentile was also used to investigate the percentage of individuals who met the sample points above the cross-sectional considered normal for the variables studied, the percentage of the constituent tissues of the body: fat, muscle, bone and liquid, as well as socio-behavioral data such as level of education and gender.

RESULTS AND DISCUSSION

Table 1 presents the characteristics of the sample of police officers, age in years, while police in years, time CIA Shock in months, body weight and height, expressed as mean and standard deviation.

Table 1 - Sample characteristics of police CIA shock, age, length of police time in Cia shock, body weight and height, expressed as mean and standard deviation.

Variable	Age years	TP years	TCS months	BW (kg)	S (m)
Medium	31,1	7,2	19	81,54	1,75
SD	4,47	0,7	6,36	15,9	0,06

TP = time police; TCS = time CIA Shock; BW = body weight; S = stature SD = standard deviation. Source: authors.

The general mean age was 31.1 years of age followed by the standard deviation of 4.47. Working time within the police was 7.2 years and time in CIA shock of 19 months with a standard deviation of 0.70 and 6.36 respectively. Variables, body weight and height, the means obtained were 81.54 kg and 1.75 meters and standard deviations of 15.9 and 0.06.

A survey of police in Minas Gerais by Braga et al., (2011) found similar to this research to the variables body weight and height 82.9 kg and 1.76 m result. In their study Braga achieved a very similar to this survey sample and 18 males aged between 18 and 41 years.

Oliveira et al., (2011) investigated the same variables in a population of sergeants in Porto Velho and found that for the average body weight was 82.6 kg. The height was 1.74m and age of 44 years.

The cited studies corroborate the results observed in the initial research on the variables body weight, height, with very similar results. Age, however was not analyzed in this study and disagree, since it is above the population average in Teresina-PI.

The Time police checked was 7.2 years and 19 months in CIA shock. Light, Lucas and Caputo (2011) conducted a study with the BOPE police of the state of Santa Catarina and reported the average time on the force equals 16.9 years, which is more than double that found in our study.

The height can be explained by the minimum requirement to join the police, however, there was no difference between the populations of the aforementioned regions, South, North and Northeast.

Table 2 listed the results of the socio-behavioral data gender, education level and physical activity, expressed in percentage.

Gender		Level of schooling		Practice Exercise	
M	100%	**CHE**	26,31%	**Yes**	63%
F	0%	**IHE**	52%		
		HS	21,69	**No**	37%

Complete Higher Education; Incomplete Higher Education; High School. Source: authors.

The population surveyed was formed as a total of 100% for males. Of these, 26% had a higher education; 52% were nearing completion of higher education and only 21.69% were in high school. As for the practice of physical exercises, 63% of the sample surveyed said they practiced some form for at least three times per week and 37% said no not practice. However, all stated they practiced twice a week, the football police workplace.

No studies on educational level of police officers were found, however, in our investigative design, we use this variable as a way to better understand the profile of the military police of Piauí.

Research conducted by Milan and Ferreira (2013) in Mato Grosso do Sul with a universe of 30 officers, 25 males and 05 females, found high levels of inactivity. The study concluded that 50% of the population were in sedentary level and 50% active. This finding differs from those observed in our study, since the percentages for the level of physical activity was 50% while the current study the same variable obtained 63% of the active sample. It is noteworthy that our sample size is lower.

The results of a survey conducted by Lamb (2007) with police tactical force Florianópolis - SC having these, aged between 22 and 43 years attests to the 40 men who comprised the study sample, 100% are classified as active. These findings differ from our results, however, the factor redominante is very positive, since physical activity at optimal levels promote health and wellness.

Study developed in Mata de São João - Bahia by Jesus and Pitanga (2011) with 51 male police officers taking ages 21-49 years indicates prevalence of low levels of physical activity for all officers who composed the sample universe of research .

Table 3 contains the description of body composition by bioelectrical impedance method, described in percentage. The items analyzed by the method of bioimpedance are: Adipose tissue, fluid tissue, muscle tissue and bone tissue. However, results are presented as mean and standard deviation.

Table 3 - Body composition by bioelectrical impedance method and percentages for the variables: adipose tissue (G%), net fabric (L%), muscle mass (MM%) and bone mass (MO%) expressed as percentages.

Variable	FP %	L %	MM %	BM %
Medium	27,74	50,78	40,59	3,07
DP	11,8	8,06	3,75	0,07

Source: authors SD = standard deviation; FP = fat percentage; L=liquid; MM= muscle mass; BM= bone mass

The average found for the percentage of fat (adipose tissue) was 27.74%, followed by the standard deviation of 11.8;

liquid tissue (U%) presented with an average of 8.06 to 50.78%, and standard deviation. Muscle mass (MM%) of the population studied showed an average of 40.59% and bone mass (O%) with 3.07%, both with standard deviation of 3.75 and 0.07 respectively.

Suggested values for fat percentage according to gender and age range of 31.1 years would be between 8% and 19%, however the average group surveyed is presented with an average above 27%, which ranks as "obese" according to the method adopted. Knowing that body fat has been widely used as a health indicator and correlated to numerous diseases, especially chronic non-communicable diseases and cardiovascular.

The bioimpedance it is a relatively new method and its use in research is still in infancy stage, hampered the fact that discussion of this research. Therefore, only the percentages of fat and muscle mass are discussed, since other methods were not found to corroborate or refute the findings on body constitution is as previously defined by the method of bioimpedance.

Lamb (2007) studied the body composition of 40 police officers aged between 22 and 43 years of tactical strength of Florianópolis - SC and found that 100% were within the recommended standards. However, the method adopted by Lamb differs from ours.

Braga et al., (2011) found the body composition of police in Minas Gerais and found a percentage equivalent to 26% fat. Result that is very similar to research conducted in Piauí, since their sample consisted of 18 officers aged between 18 and 41 years male. The study corroborates research Braga Cia shock in the sample, the age and body fat percentage.

The percentage of fat in the study of Braga et al., (2011) very closely resembles the Cia shock of Piauí, which is above the desired level, however, we emphasize that the measurement methods are different group .

The average for the muscle mass of our study was 40.59%, significantly higher. Study with the BOPE Santa Catarina by Light, Lucas and Caputo (2011) found an average of 33.9% of muscle mass in those policemen. It is emphasized that this assessment was conducted by the method of somatotype and not by bioimpedance.

Net tissue observed in this study averaged 50.78% and the the bone mass was 3.07%. These variables were not identified in other studies to corroborate with ours. While knowing the difficulties to support our findings in this research, since the method used to assess body composition, it is not a common method, we knew we would give the first step on that path.

Body composition is a parameter associated with the health-disease process, therefore, independent of the method used to investigate, is still valid evaluate the components of it to avoid pathological processes in the population, in this case the police officers who, because of their mission to society, needs to be in good health and thus to develop their roles with quality and safety.

CONCLUSION

Possession of the data analyzed, it can be concluded that the officers of the Company shock BPRONE Military Police of Piauí meet with the percentage of fat above the desired range. The values of liquid tissues, bone and muscle are within the appropriate cut-off point. Although not discussed because they have not published studies on the subject and the method of bioimpedance.

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Rua Capitão Tomaz de Aquino, 3863 Ap-103 Bl-04
Residencial Parque do Leste, Piçarreira. CEP: 64056-520
Teresina-Piauí-Brasil

ESTIMATING BODY COMPOSITION IN BIOIMPEDANCE: A STUDY WITH THE POLICE CIA SHOCK MILITARY POLICE PIAUÍ

ABSTRACT

Introduction: Body composition is one of the components of physical fitness and interferes directly or indirectly in overall fitness. It is believed that officers who submit the best level of body composition may also show better performance in other items of physical fitness. Objective: To assess body composition by bioimpedance technique and physical fitness components of the Company's officers Shock Battalion Rounds Chichi Special Natures (BPRONE) of the Military Police of Piauí. Methodology: The survey was characterized as a field study of quantitative and descriptive transversal character. The study was conducted in the city of Teresina-Pi in the period January to July 2014, with the initial sample 31 police officers, male, aged between 20 and 39 years of Cia Shock BPRONE the Military Police of Piauí. Results: The mean for age was 31.1 years; working time within the police was 7.2 years and time in CIA shock of 19 months; Body weight and height were 81.54 kg and 1.75 meters. The fat percentage was 27.74%; liquid tissue (LT%) presented with the average 50.78%. Muscle mass (MM%) of the population studied showed an average of 40.59% and bone mass (BM%) with 3.07%. Conclusion: It is concluded that the officers of the Company shock BPRONE Military Police of Piauí meet with the percentage of fat above the desired range. The values of liquid tissues, bone and muscle are within the appropriate cut-off point. Although not discussed because they have not published studies on the subject and the method of bioimpedance.

KEYWORDS: Body composition, military police, bioimpedance

RÉSUMÉ

Introduction: La composition corporelle est l'une des composantes de la condition physique et interfère directement ou indirectement à la condition physique générale. On croit Que les agents qui soumettent le meilleur niveau de la composition corporelle peut montrer une meilleure performance également dans les autres éléments de la condition physique. Objectif: évaluer la composition corporelle par impédancemétrie et technique de composants de conditionnement physique des officiers les rounds suivants de la Société Chichi spécial Shock Bataillon Natures (BPRONE) de la police militaire de Piauí. Méthodologie: L'enquête a été caractérisée comme une étude de terrain de caractère quantitatif et descriptive transversale. L'étude a été menée dans la ville de Teresina-Pi dans la période Janvier to Juillet 2014, avec les initiales échantillon de 31 agents de police, des hommes, âgés entre 20 et 39 ans de Cia Shock BPRONE la police militaire de Piauí. Résultats: L'âge moyen était de 31,1 ans pour les; Dans l'équipe de police de travail était de 7,2 ans et le temps de la CIA choc de 19 mois; Le poids corporel et la taille étaient 81,54 kg et 1,75 mètres. Le pourcentage de graisse était de 27,74%; tissu liquide (U%) Présenté à la moyenne de 50,78%. La masse musculaire (MM%) de la population étudiée a montré une moyenne de 40,59% et la masse osseuse (% O) avec 3: 07%. Conclusion: il est conclu que les dirigeants de la Compagnie de police militaire choc BPRONE de Piauí rencontrer le pourcentage de graisse au-dessus de la plage souhaitée. Les valeurs de tissus liquide, les os et les muscles sont dans le point de coupure approprié. Bien que pas discuté parce qu'il n'a pas publié des études sur le sujet et la méthode de bio-impédance.

MOTS-CLÉS: la composition du corps, la police militaire, bio-impédance.

RESUMEN

Introducción: La composición corporal es uno de los componentes de la condición física e interfiere directa o indirectamente en la condición física general. Se cree que los agentes que presenten el mejor nivel de la composición del cuerpo también pueden mostrar un mejor rendimiento en otros artículos de la aptitud física. Meta: Evaluar la composición corporal por bioimpedancia técnica y componentes de la aptitud física de los oficiales de la Compañía del Batallón de Choque Rondas Chichi Naturalezas Especial (BPRONE) de la Policía Militar de Piauí. Metodología: El estudio se caracteriza como un estudio de campo de carácter cuantitativo y descriptivo transversal. El estudio se llevó a cabo en la ciudad de Teresina-Pi en el período de enero a julio de 2014, con la muestra de 31 agentes de la policía iniciales, masculino, con edades entre 20 y 39 años de Cia Choque BPRONE la Policía Militar de Piauí. Resultados: La media de edad fue de 31,1 años; El tiempo de trabajo dentro de la policía fue de 7,2 años y tiempo en estado de shock de la CIA de 19 meses; El peso corporal y la altura fueron 81,54 kg y 1,75 metros. El porcentaje de grasa fue 27,74%; tejido líquido (T%) presentó con el promedio 50,78%. La masa muscular (MM%) de la población estudiada mostró un promedio de 40,59% y la masa ósea (O%) con 3,07%. Conclusión: Se concluye que los oficiales de la Compañía de Policía Militar choque BPRONE de Piauí cumplen con el porcentaje de grasa por encima del rango deseado. Los valores de tejidos líquido, hueso y músculo están dentro del punto de corte apropiado. Aunque no se discute porque no se han publicado estudios sobre el tema y el método de bioimpedancia.

PALABRAS CLAVE: composición corporal, la policía militar, de bioimpedancia.

ESTIMATIVA DA COMPOSIÇÃO CORPORAL POR BIOIMPEDÂNCIA: UM ESTUDO COM POLICIAIS DA CIA DE CHOQUE DA POLICIA MILITAR DO PIAUÍ

RESUMO

Introdução: A composição corporal é um dos componentes da aptidão física e interfere diretamente ou indiretamente no condicionamento físico geral. Acredita-se que os policiais que apresentarem melhor nível de composição corporal possam também demonstrar melhor desempenho nos demais itens da aptidão física. Objetivo: Avaliar a composição corporal por meio da técnica de bioimpedância e os componentes da aptidão física de policiais da Companhia de Choque do Batalhão de Rondas Ostensivas de Naturezas Especiais (BPRONE) da Policia Militar do Piauí. Metodologia: A pesquisa realizada caracterizou-se como um estudo de campo de caráter descritivo quantitativo e transversal. O estudo foi realizado na cidade de Teresina-Pi no período de janeiro a julho de 2014, tendo como amostra inicial 31 policiais, do sexo masculino, com faixa etária entre 20 e 39 anos da Cia de Choque do BPRONE da Policia Militar do Piauí. Resultados: A média para idade foi de 31,1 anos; o tempo de trabalho dentro da polícia foi 7,2 anos e tempo na CIA de choque de 19 meses; peso corporal e estatura foram 81,54 kg e 1,75 metros. O percentual de gordura foi de 27,74%%; o tecido líquido (L%) apresentou-se com a média 50,78%%. A massa muscular (MM%) da população pesquisada se mostrou com média de 40,59% e a massa óssea (O%) com 3,07%. Conclusão: Conclui-se que os policiais da Cia de choque do BPRONE da policia militar do Piauí se encontram com o percentual de gordura acima dos valores desejados. Os valores de tecidos líquido, ósseo e muscular estão dentro do ponto de corte adequado. Embora não discutidos por não haverem estudos publicados sobre a temática e o método de bioimpedância.

PALAVRAS-CHAVE: Composição corporal, policiais militares, bioimpedância.