

## 136 - ANALYSIS THE EFFECTIVENESS OF THE TRAINING IN CIRCUIT IN THE IMPROVES BODY COMPOSITION AND FUNCTIONAL ASPECT IN SEDENTARY WOMEN

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### INTRODUCTION

Nowadays it is common to find individuals with high levels of obesity, a considerable risk for the development of cardiovascular disease, increased incidence of joint problems due to the overload provided by excess weight, back pain and dissatisfied with their weight considering the aesthetic models of reference.

Some studies related diseases and future health risks the amount of fat in certain body parts, others have shown that a high concentration of abdominal fat (near the heart), even without considering the degree of obesity, is a risk factor for the development of heart disease.

Thus an increasing concerns those individuals with decreased body weight and muscle definition preventing or decreasing the incidence of these diseases currently considered as the results of the weight loss process. Objective sought for aesthetic purposes or improved health or quality of life. These individuals opt for diets, hiking and still others with more awareness seek gyms or nutritionists where found trained professionals to help them achieve their goals as desired. But it is not known how best training combined with a balanced diet to achieve this goal of frequenting gyms, some authors advocate the idea of only aerobic activity and in other hand claim to be a combination of aerobic activity and weight training program more efficient to decrease the percentage of fat and reduce health risks from excess weight and / or accumulation of fat in certain body parts.

It is known that with aerobic activity can reduce the percentage of fat depending on caloric expenditure that occurs during the development of the activity, but with no knowledge of that activity bodybuilding muscles continue burning calories after the workout, which could justify this work is of great importance in achieving the goal of this target population.

This study does not intend to defend this or that training program and saturate the subject of study, considering that many studies are still needed to prove the actual efficiency of this program or the program's superiority over another circuit as regards achieving the goals defined by the target population. Therefore the aim of this study is justified by the analysis of the effectiveness of the training program combined with aerobic fitness to guide the development of subsequent work on this subject and still base the development of training programs in the gyms that receive this kind of population, facilitating the student reach their goal faster and therefore greater satisfaction on the part of this that will meet your needs in a shorter time.

### METHODOLOGY

This is a research field of explanatory power, being a kind of dialectical research-inductive and quanti-experimental approach with quantitative and qualitative.

The choice of participants was intentional, were selected and analyzed 5 females, sedentary and over weight, who did enroll in the academy Clinic Santee aged between 18 and 30 years. Named Student 1, Student 2 Student 3, Student 4 and Student 5. The instruments of data collection were: adipometer Sanny (Compass skinfolds), with the following specifications: Probes: oval with an area of approximately 97 mm<sup>2</sup>; Range: Measuring range 0-78 mm; Graduation measuring range in tenths of a millimeter, 1:10; pressure: Actuator with spring clamp, pressure + / - 9.8 g / mm<sup>2</sup>; raw material of the jaws: Polycarbonate lexan; Clock measurement: radial engine with ruby bearings; weight. 295 g; Measuring tolerance: + / - 0.5 mm. The body density was calculated according to protocol as Jackson et al, 1980 as formula below, and arrive to the percentage of fat by the body density used the formula of Siri (1961).

Calculation of body density second Jackson et al, 1980

female

$DC = 1,0994921 + 0.0009929 (X2) + 0.0000023 (X2)^2 - 0.0001392 (X3)$

where:

$X2 = \sum DC$  triceps, suprailiac and thigh

$X3 =$  age in years

Where: DC: body density, CX: thigh skinfold, SI: supra iliac skinfold and AB: abdominal skin fold.

Siri equation (1961)

$F\% = (4.95 - DC) \times 100$

DC

Test hip flexion to assess the functionality of the motor flexor muscles of the hip and trunk, the subject was positioned lying on the mat, with his back against the ground, knees bent and the soles of the feet resting on the ground, in the hands of line ears, the appraiser valued the safe heels and this starts the motion of trunk flexion and hip, up to the front of the trunk to get as close as possible to the front of the thigh, returns the starting position and perform as many repetitions possible in 1 minute. To calculate the index of muscular endurance, use the amount of repetitions of movements in hip flexion test at 30 and 60 seconds. With these values the observed resistance by the formula:

$IR = ((FQ60" / FQ30") / 2) \times 100$

Where:

FQ60" = total reps in 60"

FQ30" = total reps in 30"

Hip Flexor test in 1 min. (YMCA, 1989)

Percentile	Age group					
	125	225	325	425	525	>65
<b>Men</b>						
95	54	50	46	41	32	33
75	45	41	36	29	26	22
50	37	33	29	22	18	17
25	30	28	22	17	12	10
05	17	12	09	08	04	04
<b>Woman</b>						
95	48	42	38	30	29	26
75	37	33	27	22	18	18
50	30	26	21	16	11	12
25	24	20	14	09	06	04
05	10	02	02	01	01	00

Source: BAUMGARTNER & JACKSON, 1995

After the completion of the pre-test and analysis of data, the program was designed to work aerobic training combined with work stress resistance, which consists of 40 minutes of treadmill, bike or elliptical and 20 minutes of weight training, divided into 4 stages: for every 10 minutes of aerobic activity the individual should do 5 minutes of weight training, this time with 5 minutes of weight divided into 30 seconds for home exercises, during which the subjects were to perform as many repetitions as possible while respecting the right of way perform the movements between each exercise the subjects had 8 seconds to make the switch. Follow the table below with the exercises.

Bodybuilding Training Program

Monday	Tuesday	Wednesday	Thursday	Friday
Incline bench press	Cable close grip pulldown	Rest.	Incline bench press	Cable close grip pulldown
Leg press	Banco abductor	Rest	Leg press	Banco abductor
Cable pushdown	Dumbbell Curl	Rest	Cable pushdown	Dumbbell Curl
Lever leg extension	Lever lying leg curl	Rest	Lever leg extension	Lever lying leg curl
Dumbbell shoulder press	Barbell upright row	Rest	Dumbbell shoulder press	Barbell upright row
Lever seated hip adduction	Lever stading calf raise	Rest	Lever seated hip adduction	Lever stading calf raise
Dumbbell Side Bend	Ball crunch	Rest	Dumbbell Side Bend	Ball crunch
Wheighted twisting crunch	Lying lighip raise	Rest	Wheighted twistingcrunch	Lying lighip raise

The individuals trained for six weeks, 4 days per week and 60 minutes per day. They had to rest and recover Wednesday and the weekend. Every two weeks the individuals were subjected to post-test and at the end of the training period the test results of each individual were tabulated, the graphics developed, analyzed and the results discussed checking if there was a decrease in the percentage of fat and improved resistance the hip flexor muscles.

For the statistical analysis software used was Statistica 10.

RESULTS AND DISCUSSION

The results are expressed in the tables below as well as the mean and standard deviation of the data analyzed.

Table 1. Performance Testing of Hip Flexion in 1 Minute-HF (in repeats) Mean and standard deviation. (n = 5)

HF 1	20,2	±12,69
HF 2	23,6	±14,24
HF 3	27,6	±15,66
HF 4	28,6	±15,38

It can be observed that in the pretest of hip flexion in a minute FQ (in repeats), the average score was 20.2 and standard deviation of ± 12.66, post-test two weeks of training average 23.6 and standard deviation of ± 14.24, whereas after four weeks these values were 27.6 for the mean and ± 15.66 for the standard deviation and, after six weeks the average was 28.6 and a standard deviation of ± 15.38, increased the mean and standard deviation, both significant.

Table 2. Behavior Body Mass MC (in kg). Mean and standard deviation (n = 5)

BM1	68,48	±9,28
BM2	67,28	±9,37
BM3	66,76	±9,35
BM4	66,32	±9,40

As regards the behavior of the mass body-MC (in kg), the average obtained at pre-test was 68.48 and the standard deviation was ± 9.28 in the post-test average two weeks training 67 28, and the standard deviation ± 9.37 after four weeks these values were 66.76 for the average and ± 9.35 for the standard deviation and, after six weeks the average was 66.32 and standard deviation of ± 9.40, with substantial amounts of the program.

Table 3. Behavior-% Body Fat G, as Jackson et al, 1980 (in%). Mean and standard deviation (n = 5)

%BF1	27,92	±3,66
%BF2	25,82	±3,90
%BF3	25,26	±4,01
%BF4	25,03	±4,07

Regarding the behavior of body fat%-G, as Jackson et al, 1980 (in%), the average pre-test was 27.92, with a standard deviation of ± 3.66, post-test two weeks training average of 25.82 and a standard deviation of ± 3.90 after four weeks average of 25.25 and a standard deviation of ± 4.01 and after six weeks of training achieved the average deviation was 25.03 and standard ±

4.07, being the most significant values.

Table 4. P values for the CF test

HG 1 x HF2	0,158
HF 1 x HF3	0,014*
HF 1 x HF4	0,010*
HF 2 x HF3	0,071
HF 2 x HF4	0,040*
HF 3 x HF4	0,034*

\* Statistically significant difference with  $p \leq 0.05$

Table 5. P values for Body Mass

BM 1 x BM2	0,020*
BM 1 x BM3	0,007*
BM 1 x BM4	0,004*
BM 2 x BM3	0,000*
BM 2 x BM4	0,000*
BM 3 x BM4	0,001*

\* Statistically significant difference with  $p \leq 0.05$

Table 6. P values for the Body Fat

%BF 1 x %BF2	0,017*
%BF 1 x %BF3	0,004*
%BF 1 x %BF4	0,004*
%BF 2 x %BF3	0,013*
%BF 2 x %BF4	0,002*
%BF 3 x %BF4	0,010*

\* Statistically significant difference with  $p \leq 0.05$

Through Tables 4, 5 and 6 it can be seen that there was no statistically significant difference for all evaluations in body composition indicators, showing that the program was effective at all times.

Regarding the functional aspect, significant differences were found in 4 of the 6 possible relationships in hip flexion, suggesting a functional improvement in response to the program.

#### CONCLUSION

It is considered that further studies are needed to better control and knowledge of the possible variables found in this study, with different target population and larger number of samples. Thereby increasing the value of the significance of circuit training program, decreasing the percentage of fat and with respect to the functional aspect of the same. Taking into account that the sample studied was no significant difference in 4 of the 6 possible relationships in hip flexion, suggesting a functional best for the program and according to the tables it was observed that there was no statistically significant difference in evaluations of indicators body composition, suggesting that the program was effective throughout its development.

We conclude that the circuit training program was effective in reducing the percentage of fat, resulting in changes in body composition and functional improvement of subjects studied and can be used by those professionals whose students aspire to the same goal of individuals subjected to this study.

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#### ANÁLISIS THE EFFECTIVENESS OF THE TRAINING IN CIRCUIT IN THE IMPROVES BODY COMPOSITION AND FUNCTIONALASPECT IN SEDENTARY WOMEN

Commonly found individuals dissatisfied with their weight and body appearance, with high levels of obesity and / or overweight, meaning a risk factor for development of cardiovascular disease and increased incidence of joint problems due to the

overloading joints. Thus it is a growing concern of individuals with decreased body weight, muscle definition and prevent or decrease the incidence of these diseases currently considered as results of weight loss process. The present study aimed to analyze the efficacy of aerobic training program combined with weight training lasting six weeks in five females, sedentary and over weight and aged between 18 and 30 years, the decrease in body fat percentage and in relation to the functional aspect, considering the pre and post-tests of the composition second body Jackson et al. 1980 and hip flexion in a minute, the table BAUMGARTNER & JACKSON, 1995. From the results it can be observed that there was a statistically significant difference in the ratings for all indicators of body composition, which demonstrates that the program was effective at all times and in relation to the functional aspect, significant differences were found in 4 of the 6 possible relationships in hip flexion, suggesting a functional improvement in response to the program. We conclude that the circuit training program was effective in reducing the percentage of fat (body composition) and functional improvement of subjects studied and can be used by those whose goal is the same as submitted to the study.

Keywords: Athletic training, Body composition, Sedentary lifestyle.

#### ANÁLISIS DE LA EFICACIA DEL ENTRENAMIENTO EN CIRCUITO EN MEJOR COMPOSICIÓN DEL CUERPO Y ELASPECTO FUNCIONAL EN LAS MUJERES SEDENTARIAS

Comúnmente se encuentran individuos insatisfechos con su peso y la apariencia del cuerpo, con altos niveles de obesidad y/o sobrepeso, es decir, un factor de riesgo para el desarrollo de la enfermedad cardiovascular y aumento de la incidencia de problemas en las articulaciones debido a la sobrecarga de las articulaciones. Por lo tanto, es cada vez mayor la preocupación de estos individuos con la disminución del peso corporal, definición muscular y prevenir o reducir la incidencia de estas enfermedades que actualmente se consideran como resultados del proceso de pérdida de peso. El estudio tuvo como objetivo analizar la eficacia del programa de entrenamiento aeróbico combinado con el peso, con duración de seis semanas en cinco mujeres, sedentarias, con sobrepeso, edad entre 18 y 30 años, la disminución en el porcentaje de grasa corporal y en relación con el aspecto funcional, teniendo en cuenta las pre y post-pruebas de la composición corporal según Jackson et al. 1980 y flexión de la cadera en un minuto, en la tabla del BAUMGARTNER y JACKSON, 1995. Mediante los resultados se puede observar que existía una diferencia estadísticamente significativa en las puntuaciones de todos los indicadores de la composición corporal, lo que demuestra que el programa fue efectivo en todo momento y en relación con el aspecto funcional, hubo diferencias significativas en 4 de las relaciones de 6 posibles en flexión de la cadera, lo que sugiere una mejora funcional en respuesta al programa. Llegamos a la conclusión de que el programa de entrenamiento de circuito fue eficaz para reducir el porcentaje de grasa (composición corporal) y la mejora funcional de los sujetos estudiados y puede ser utilizado por aquellos cuya meta es el mismo que sometidos al estudio.

Palabras clave: entrenamiento atlético, composición corporal, estilo de vida sedentario.

Communément nous trouvons les personnes insatisfaites de leur poids et aspect, avec les niveaux élevés d'obésité et de surpoids, cela signifie un facteur de risqué pour le d'veloppement des maladies cardiovasculaires et l'augmentation de l'incidence des enjeux comuns, em raison de la surcharge des articulations. Cependant il est chaque fois plus grand le preoccupation de cetttes personnes avec la diminution de le poids, definition musculaire et la prevention ou diminution dans l'incidence de cetttes maladies actuelles, conserderés comme resultáts du processus de perte de poids. L'objectif de ce travail était d'analyser l'efficacité du programme d'entraînement aérobic combine avec l'entraînement de musculation avec durée de six semaines dans 5 femelles âgées entre 18 et 30 ans, sedentaires et avec surpoids, dans la diminution du pourcentage de graisse et em ce qui concerne l'aspect fonctionnel, considérant les tests pré et post de la composition corporelle de BAUMGARTNER et JACKSON, 1995. Parmi les résultats, on peut noter qu'il y a différence statisquement significative pour toutes les evaluations sur les indicateurs de la composition corporelle, ça demontre que le programme était efficace à tout moment et en ce qui cncerne l'aspect fonctionnel. Il y avait difference significative dans 4 des 6 relations possibles en flexion de hanche, Ce qui suggère l'ammélioration fonctionelle en réponse au programme. On en conclut que le programme de formation de circuit a été efficace en réduisant le pourcentage de matière grasse (composition corporelle) et l'ammélioration fonctionelle de les personnes étudiés, peue être utilize par ceux don't le but est le meme de l'étude.

Mots-Clavés: Entraînement sportif, composition corporelle, mode de vie sédentaire.

#### ANÁLISE DA EFICÁCIA DO TREINAMENTO EM CIRCUITO NA MELHORA DA COMPOSIÇÃO CORPORAL E ASPECTO FUNCIONAL EM MULHERES SEDENTÁRIAS

Comumente encontramos indivíduos insatisfeitos com seu peso e aspecto corporal, com altos níveis de obesidade e/ou sobrepeso, que significam um fator de risco para o desenvolvimento de doenças cardiovasculares e aumento na incidência de problemas articulares em função da sobrecarga nas articulações. Desta forma é cada vez maior a preocupação destes indivíduos com a diminuição do peso corporal, definição muscular e prevenção ou diminuição na incidência dessas doenças da atualidade consideradas como resultados do processo de emagrecimento. O presente estudo teve por objetivo analisar a eficácia do programa de treinamento aeróbico combinado com musculação com duração de seis semanas em 5 indivíduos do sexo feminino, sedentários e com sobrepeso com idade entre 18 e 30 anos, na diminuição do percentual de gordura e em relação ao aspecto funcional, considerando o pré e pós-testes da composição corporal segundo Jackson et al. 1980 e flexão do quadril em um minuto, na tabela de BAUMGARTNER & JACKSON, 1995. Através dos resultados pode-se observar que houve diferença estatisticamente significativa para todas as avaliações nos indicadores de composição corporal, o que demonstra que o programa foi efetivo em todos os momentos e em relação ao aspecto funcional, houve diferença significativa em 4 das 6 relações possíveis na flexão de quadril, sugerindo a melhora funcional em resposta ao programa. Conclui-se que o programa de treinamento em circuito foi eficaz na diminuição do percentual de gordura (composição corporal) e melhora funcional dos indivíduos estudados, podendo ser utilizado por aqueles cujo objetivo seja o mesmo dos submetidos ao estudo.

Palavras-chave: Treinamento Desportivo, Composição corporal, Sedentarismo.