

**24 - EFFECTS OF A INDOOR CYCLING IN ADOLESCENTS OF PUBLIC EDUCATION NETWORK**WANESSA YSIS GARCEZ DE SOUZA<sup>1</sup>RODRIGO PEREIRA DA SILVA<sup>1</sup>GABRIEL GHEDINI<sup>2</sup>DILMAR PINTO GUEDES JUNIOR<sup>1,3,4</sup>FABRÍCIO MADUREIRA BARBOSA<sup>1,2</sup>

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**INTRODUCTION**

Adolescence is characterized by several changes in the human body, among them one can mention the changes, physical, psychological and social, so it is considered the most critical period of human development (Gallahue & Ozmun, 2003; Pires et al., 2004; Helena & Aznar, 2010). Being a period of transition from childhood to adulthood, this stage there is a greater demand on the part of parents and society, increasing the pressure of school exams, bullying by colleagues, the need for self-assertion, which may contribute in the onset of stress (Ferreira e Farias, 2010). Another factor that may cause future problems is the tendency of teenagers to be more time in school, doing more activities that develop their cognitive potential, than by exercising in this way in school, young people spend more time in the room than sitting in class activities (eg, block, patio, pool, etc.). Outside school hours teens tend to spend more hypokinetic activities such as watching television, playing video games and stay in front of the computer than playing sports or physical exercise (Rocket, 2000; Rivera et al., 2010). The lack of movement at this stage of life, can result in various problems that tend to worsen into adulthood as degenerative diseases, motor developmental delay, obesity and declining physical fitness (Silva et al, 2010). To Pires et al. (2004), there is evidence that physical activity in this age group, benefits the skeletal health, control of blood pressure and obesity. Based on this affirmative exercise shown to be important for adolescent development. One of the methods of academia that grows in the news is the indoor cycling, this type of exercise has the potential to promote physical activity in this age group, being held in a group modality and easy to learn, yet, being stationary decreases the risk of falls and injuries from impact when compared to other aerobic activities Domingues Filho (2000). Results of work by Goldberg (2001) and Mello et al. (2003), suggest that indoor cycling mode provides cardiorespiratory benefits, reducing body fat and cardiovascular risk reduction, however, are still few studies related to indoor cycling adolescents. The objective is to examine the effects of indoor cycling among adolescents in public schools.

**MATERIALS AND METHODS**

Evaluations were conducted at the Laboratory of Physical Evaluation and Performance Motor, an indirect method (noninvasive), through some tests, horizontal jump in order to evaluate the power of lower limbs, the test measures the ability to make a maximum effort to jump the longest distance without running jump (Matsudo, 1995); test 10 MRI to measure the strength of lower limbs in the leg press 45, where, to reduce the probability of error, there were three attempts to find the maximum load of RM 10 (Bachle and Earle, 2000) between the trials was given a 3-minute interval, subjects were instructed to correct movement, and there could be any help to complete the secondary with 10 repetitions, if they occur is considered previous cargo; abdominal endurance test, where the performer should make maximum repetitions in 1 minute, having to be with hands on their neck and pull up to the elbows on his knees (Pollock and Wilmore, 1993), members of the resistance test through the upper arm flexion exercise where the individual would have his hands a foot away from the shoulders, and lower the body touching the chest down and up, for 1 minute for maximum repetitions (Pollock and Wilmore, 1993), anthropometric tests: weight, height, body mass index for girls hip circumference, waist, arm, thigh and leg, skin folds - triceps, suprailiac and thigh circumference for boys and the torax, abdomen, arm, thigh and leg, skin folds - chest, abdomen and thigh (Jackson and Pollock, 1978). The anthropometric tests were performed before, during and at the end of the experiment in order to gain greater control of the development of adolescents. The tests to assess strength, endurance and power, were performed before and at the end of the experiment to compare if there were modifications of the variables.

Classes were held three times a week, lasting 60 minutes each class, totaling 30 training sessions in indoor cycling. Some of the requirements for participation in the experiment were: completing the term of free informed consent of parents, delivery of medical certificates to determine your general health and not exceed three absences per month with no explanation. The initial sample was composed of 17 young volunteers, however, abandoned the project three teenagers began working as teenagers and 4 exceeded the boundary faults. Therefore, the final sample consisted of 10 adolescents with a mean (SD) age 14.3 (1.7) years, weight 68 (12) kg and height 170.0 (0.1) cm. The classes took place in a room at a temperature of about 22 ° C, stationary bikes SCHWINN® brand, with sound equipment and water fountains nearby, were taught by a specialist teacher in indoor cycling and three interns. In class work was done in which they pedaled their intensities, moderate and strong (Brennan cited Wilder and Brennan, 1993). The classes consisted of periods of 3 to 5 minute warm up, interval training with variations of speed, intensity levels with increasing loads, varying positions on the bike as sitting, footprint 2 (standing) and footprint 3 (standing, holding on the far side of the handlebar, hips back and trunk more inclined), and dynamic recovery intervals, such as games, quizzes, juggle and perceptual activity. The period of calm was back in about 4 minutes, characterized by relaxation strategies, stretching, self massage and spin on the bike with low loads.

The project was conducted at the Faculty of Physical Education at Santos - FEFIS - UNIMES (ACADEMY PHYSICAL PLANET): Street Barão de Paranapiacaba, No. 15 - Crossroads - Santos.

Statistical analysis: the distribution of results was assessed by the normality test of Shapiro-Wilk test and by inspection of quantile graphs, aiming to see if the variables are distributed similarly to the normal curve (or curve Gauss). All variables met the assumptions of normality for the three stages of evaluations. For the anthropometric variables and body composition, because they have three times (pre, post and intermediate) chose to use the statistical method ANOVA One-Way. However, for the performance variables used the Student t test for repeated measures. Significance is accepted at  $\alpha = 0.05$ .

## RESULTS

## Body Composition

Table 1. Description of body mass, height and density in adolescents after 11 weeks of indoor cycling.

	Body Mass (kg)			Height (m)			Density		
	Pré	Inter	Post	Pré	Inter	Post	Pré	Inter	Post
Average	68,5	67,8	68,0	1,6	1,7	1,7	1,0	1,0	1,0
S.D.	12,5	12,3	12,0	0,1	0,1	0,1	0,0	0,0	0,0

S.D., Standard Deviation

Table 2. Description of body circumferences in adolescents after 11 weeks of indoor cycling.

	Circumferences								
	Arm (cm)			Waist (cm)			Hip (cm)		
	Pré	Inter	Post	Pré	Inter	Post	Pré	Inter	Post
Average	28,6	28,4	28,6	78,0	78,0	77,7	97,7	98,3	98,3
S.D.	4,0	4,0	4,3	13,8	13,8	14,1	10,9	10,0	10,9

S.D., Standard Deviation.

Table 3. Description of body circumferences in adolescents after 11 weeks of indoor cycling.

	Circumferences					
	Thigh (cm)			Leg (cm)		
	Pré	Inter	Post	Pré	Inter	Post
Average	53,3	55,0	53,9	36,2	36,1	35,8
S.D.	4,7	5,5	5,2	3,7	2,9	3,0

S.D., Standard Deviation.

Table 4. Description of the sum of skinfolds and body mass index (BMI) in adolescents after 11 weeks of indoor cycling

	Sum of folds (mm)			BMI (kg/m <sup>2</sup> )		
	Pré	Inter	Post	Pré	Inter	Post
Average	89,0	91,5	83,2	25,5	25,0	25,0
S.D.	39,9	40,3	34,7	4,9	4,7	4,8

S.D., Standard Deviation.

Table 5. Description of the fat percentage, fat mass and lean mass in adolescents after 11 weeks of indoor cycling.

	Percent Fat (%)			Fat Mass (kg)			Lean Body Mass (kg)		
	Pré	Inter	Post	Pré	Inter	Post	Pré	Inter	Post
Average	29,2	29,8	27,9	20,6	20,9	19,6	47,8	46,9	48,4
S.D.	10,4	10,5	9,9	10,1	10,2	9,3	7,6	7,3	7,4

S.D., Standard Deviation.

## Physical fitness tests

Table 6. Description of the horizontal jump test and 10 RM leg press, in adolescents after 11 weeks of indoor cycling.

	Vertical jump (cm)				10 RM Leg			
	Pré	Post	Var_Abs	Var_%	Pré	Post	Var_Abs	Var_%
Average	128,9	157,8*	28,9	23,9%	151,8	227,3*	75,5	54,4%
S.D.	29,2	29,2	20,0	16,9%	50,6	56,1	23,4	22,8%

S.D., Standard Deviation.; Var\_Abs, absolute variation; Var\_%, percentage change. \* Indicates significant difference between Pre and Post (P ? 0.05).

Table 7. Description of abdominal strength and upper limb, in adolescents after 11 weeks of indoor cycling.

	Muscular Endurance							
	Abdominal (rep)				Member Institutions (rep)			
	Pré	Post	Var_Abs	Var_%	Pré	Post	Var_Abs	Var_%
Average	22,4	27,6*	5,3	34,2%	20,7	24,3	3,5	16,6%
S.D.	12,8	10,0	7,7	48,8%	4,2	9,3	8,0	39,9%

S.D., Standard Deviation; Var\_Abs, absolute variation; Var\_%, percent change; rep, number of repetitions. \* Indicates significant difference between Pre and Post (P ? 0.05).

## DISCUSSION

According to the results presented can be analyzed through the testing of body composition there were no statistically significant when analyzed the preoperative inter-and post test. Already in the physical fitness tests, long jump and 45 ° leg press, and abdominal strength test showed significant difference in pre and post training program.

## CONCLUSION

From the results it is clear that the Indoor Cycling was effective, to improve the fitness of the study group, however, the program had limitations in the analysis of variables related to body composition. Thus, further studies should be done by emphasizing the interaction between exercise and eating habits for body composition analysis

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### **EFFECTS OF A INDOOR CYCLING IN ADOLESCENTS OF PUBLIC EDUCATION NETWORK**

#### **ABSTRACT**

Adolescence is considered a crucial period for several changes occur in the human body, it is this stage that they can be numerous diseases carried into adulthood, and which sometimes are caused by lack of exercise. Thus, the Indoor Cycling has the potential to be an alternative, to be an innovative, accompanied by musical sequences that increase the motivation of those involved, easy to learn, held on stationary bike, which limits the risk of accidents, in addition to be practiced in rooms heated by favoring the dissipation of heat by the practitioner. The aim of this study was to evaluate the effects of an indoor cycling program for adolescents in public schools. The program lasted three months, with three weekly training sessions lasting 60 minutes. After signing an informed consent from their parents, participated in the experiment 10 volunteers from schools in the public schools of Santos. Tests were performed before, during and at the end of the experiment, such as assessments of body composition (body weight, height, body mass index, sum of skinfolds and body fat percentage) for testing neuromuscular tests were used and aerobic endurance strength of lower limbs and trunk.

**KEYWORDS:** Adolescent; Indoor Cycling; Exercise.

### **EFFETS D'UN PROGRAMME DE CYCLISME INDOOR CHEZ LES ADOLESCENTS DU RÉSEAU PUBLIC D'ÉDUCATION.**

#### **RÉSUMÉ**

L'adolescence est considérée comme une période cruciale parce que plusieurs changements se produisent dans le corps humain, c'est à cette période que de nombreuses maladies peuvent avoir lieu et continuer jusqu'à l'âge adulte, et qui sont parfois causées par le manque d'exercice. Ainsi, le Cyclisme Indoor (vélo d'intérieur) a le potentiel pour être une alternative, une modalité innovatrice, accompagnée par des séquences musicales qui augmentent la motivation des personnes impliquées, facile à apprendre, tenu le vélo stationnaire, ce qui limite les risques d'accidents, en plus d'être pratiquée dans des salles chauffées en favorisant la dissipation de la chaleur par le praticien. Le but de cette étude était d'évaluer les effets d'un programme de cyclisme en salle pour les adolescents dans les écoles publiques. Le programme a duré trois mois, avec trois séances hebdomadaires de 60 minutes. Après la signature d'un consentement libre de leurs parents, ont participé de l'expérience 10 volontaires des écoles du réseau public de l'Education de Santos. Des tests ont été effectués avant, pendant et à la fin de l'expérience, tels que des évaluations de la composition corporelle (poids, taille, indice de masse corporelle, la somme des plis cutanés et le pourcentage de graisse corporelle) les tests neuromusculaires ont été utilisés des tests d'endurance aérobie et de force des membres inférieurs et du tronc.

**MOTS-CLÉS:** Adolescent, Cyclisme en salle (indoor), Exercice.Physique

### **EFFECTOS DE CICLISMO INDOOR EN ADOLESCENTES DE LA RED DE EDUCACIÓN PÚBLICA**

#### **RESUMEN**

La adolescencia se considera un período decisivo, varios cambios se producen en el cuerpo humano, es esta fase que puede surgir varias enfermedades remitió a la edad adulta y que a veces son causados por la falta de ejercicio. Así, el Ciclismo Indoor tiene el potencial de ser una alternativa, por ser una modalidad innovadora acompañada de secuencias musicales que aumentan la motivación de los involucrados, fácil de aprender, que se celebró en bicicleta estacionaria, lo que limita el riesgo de accidentes; además de ser practicado en las habitaciones con calefacción mediante la promoción de la disipación de calor por los practicantes. El objetivo de este estudio fue evaluar los efectos de un programa de ciclismo indoor para los adolescentes en las escuelas públicas. El programa duró tres meses, con tres sesiones semanales de 60 minutos. Después de firmar un consentimiento informado de sus padres, participaron en el experimento 10 voluntarios de las escuelas públicas de Santos. Las pruebas se realizaron antes, durante y al final del experimento, como: evaluaciones de la composición corporal (peso, talla, índice de masa corporal, la suma de pliegues cutáneos y porcentaje de grasa corporal); para pruebas neuromusculares fueran utilizadas pruebas de resistencia aeróbica y fuerza de las extremidades inferiores y el tronco. Teniendo en cuenta las variables probadas la modalidad Ciclismo Indoor, fue eficaz en la mejora de la aptitud del grupo de estudio, sin embargo, el programa tenía limitaciones en el análisis de las variables relacionadas con la composición corporal y podría hacerse más estudios con énfasis en lo ejercicio y hábitos alimenticios.

**PALABRAS CLAVE:** Adolescente; Ciclismo Indoor, Ejercicio.

**EFEITOS DE UM PROGRAMA DE CICLISMO INDOOR EM ADOLESCENTES DA REDE PÚBLICA DE ENSINO****RESUMO**

A adolescência é considerada um período decisivo, por ocorrer diversas alterações no organismo humano, é nesta fase, que podem surgir diversas doenças levadas até a fase adulta, e que por vezes são ocasionadas pela falta de exercício físico. Desta forma, o Ciclismo Indoor tem o potencial para ser uma alternativa, por ser uma modalidade inovadora, acompanhada de seqüências musicais que aumentam a motivação dos envolvidos, de fácil aprendizagem, realizada em bicicleta estacionária, o que limita os riscos de acidentes; além de ser praticada em salas climatizadas, favorecendo a dissipação de calor por parte do praticante. O objetivo deste estudo foi avaliar os efeitos de um programa de ciclismo indoor em adolescentes da rede pública. O programa teve duração de 3 meses, com 3 sessões semanais de treino com duração de 60 minutos. Após a assinatura do termo de consentimento livre e esclarecido por parte dos pais, participaram do experimento 10 indivíduos voluntários de escolas da rede pública de ensino de Santos. Foram realizados testes antes, durante e ao término do experimento, como: avaliações da composição corporal (massa corporal, estatura, índice de massa corporal, somatório de dobras cutâneas e percentual de gordura); para os testes neuromusculares foram utilizados testes de resistência aeróbia e força de membros inferiores e tronco.

**PALAVRAS-CHAVE:** Adolescente; Ciclismo indoor; Exercício físico.