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Original Article

BODY COMBAT™ CLASSIC MUSIC IMPROVES ADOLESCENT'S STATE OF MIND

A MÚSICA NAS AULAS DE BODY COMBAT™ MELHORA O ESTADO DE ÂNIMO DE ADOLESCENTES

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RESUMO

O objetivo é analisar o efeito da prática de aula sem música e com música do programa body combat™ sobre os estados de ânimo de 29 adolescentes, 18 do sexo feminino e 11 do sexo masculino, com faixa etária de 12 a 15 anos. Foi utilizado o questionário Lista de Estados de Ânimo-Reduzida e Ilustrada (LEA-RI) composto por 14 adjetivos (7 variáveis positivas e 7 negativas), aplicado antes e depois das aulas de body combat™, na primeira semana sem música, e na segunda semana com música. Utilizou-se teste de Shapiro-Wilk, de McNemar e teste χ^2 para verificar a associação das variáveis com significância de $p< 0,05$, isto é, a 10%, 5% e 1%, com intervalo de confiança de 90, 95 e 99%, respectivamente. Na aula com música os sentimentos positivos: "feliz/alegre" (p=0,0001), "espiritual" (p<0,001), "ativo/energético" (p=0,0263), "leve" (p<0,001), aumentaram. Nas variáveis dos sentimentos negativos: "triste" (p=0,0008), "desagradável" (p=0,0013), "tímido" (p=0,0001) e "com medo" (p=0,0001), diminuíram. Nas aulas com e sem música o adjetivo "cansado" (p=0,0001) e (p=0,0020) aumentou respectivamente. Constatou-se que o body combat™, aplicado com música, aumentou significativamente os sentimentos positivos e redução dos negativos, sendo recurso motivacional para a aderir ao exercício físico.

Palavras-chave: Musicoterapia. Estado de humor. Exercício. Juventude.

ABSTRACT

We analysed the effect classes without music and the Music Body Combat ™ programme on the moods of 29 teenagers, 18 females and 11 males, aged 12-15 years. We used a questionnaire listing of *"Lista de Estados de Ânimo-Reduzida e Ilustrada"* (List of Illustrated-Lowered States) (LEA-IR) consisting of 14 adjectives (7 positive variables and 7 negative) applied before and after the body classes combat ™ in the first week without music, and in the second week with music. We used the Shapiro-Wilk test and □² McNemar test to verify the association of the variables at significance $p <0.05$, that is, 10%, 5% and 1%, confidence interval 90, 95 and 99%, respectively. There was an increase in positive feelings after class with music: "happy/joyful" (p=0.0001), "spiritual" (p<0.001), "active/energy" (p=0.0263), "light" (p<0.001). The variables for negative feelings decreased: "Sad" (p=0.0008), "unpleasant" (p=0.0013), "shy" (p=0.0001) and "scared" (p=0.0001). The "tired" adjective increased in class without music (p=0.0020) and with music (p=0.0001). It was found that the Music Body Combat ™ programme significantly increased positive feelings and reduced the negative, and was a motivational to adolescents to join the exercise.

Keywords: Music effect. State of mood. Physical activity. Young.

Introduction

The World Health Organization (WHO) estimates that 80% of the world population of adolescents is not physically active. They recommend physical activity of at least 60 minutes of moderate to vigorous intensity, and practiced at least three times a week[1]. Practice and long-term adherence is necessary for adolescents to achieve the benefits of physical activity, which is related to health, personal history, social, environmental and motivational factors[2,3]. Adolescents are in constant physical, psychological and mood transition[45]. Fitness centres, clubs and sports centres must constantly innovate their activities to motivate adolescents to physical activity and attract more followers.

There has been an expansion in the range of different activities, from the most traditional, such as aerobics and localized gymnastics, to those that work in the form of franchises (spinning™, body combat™, body step™, body pump™, jump fit™[6,7]and also the

martial arts. Body combat™ had its market launch in 2000 and is a training programme that uses movements that resemble martial arts techniques (punches, kicks and punches)[8]. This programme uses music as a resource to stimulate the intensity of the workout. The exercises were pre-choreographed prepared specifically for each type of music, with variations of rhythms, such as electrifying songs, explosive according to each phase of the class[8].

The popularity of martial arts has helped contribute to increasing interest in investigation and research[9,10] According to the Ministry of Sports of Brazil[11] Muai Thai was the eighth most practiced sport among adolescents aged 15 to 19 years, followed by the Jiu-Jitsu in 15th position. The authors[12,13] thus concluded that music contributes to motivational factors and improves the health, wellness and physical performance of physical exercise practitioners.

The environment with music is disinhibiting factor of psychological discomfort and prevents the monotony of systematic exercises. It favours a positive perception of exercise and effort that provides a pleasurable feeling. The music facilitates the self-perception of competence and self-determination to accomplish it, motivating the development of exercise[14,15]. The benefits associated with physical activity cause physiological changes: acting on sympathetic nervous control[16], n cardiac frequency and respiration[3,17], the metabolism, oxygen consumption and muscle tension[18]. The positive impact of music can improve moods[19] leading to greater adherence to regular physical exercise[14,15].

Studies analysing the contribution of music in the mood of teenagers during physical activity are scarce and controversial. A survey that examined the states of mind of female gymnasts between 9-14 years old, found a positive effect[20]. In contrast, no statistical changes were found in the states of mind of students of both sexes aged between 10 and 15 years of age, after an intervention with dance in a school[5]. Another study that used music therapy among young people with social, emotional and behavioural problems, improved the communication and sociability of people over 13 years of age, however, the study was not associated with exercise[21]. Many recent studies have been produced in order to analyse the effect of music during exercise, but have not been conducted with children and adolescents[22].

The body combat™ programme was chosen as it combines the music preferences of adolescents[23] and martial arts, which can improve moods and encourage teens to adhere to regular physical exercise.

The objective of this study was to analyse the effects of the practice of a class without music and with the Music Body Combat ™ programme on the moods of adolescents.

Methods

Participants

Experimental study washout with adolescents selected for the practice of body combat ™ programme class without music and with music. The sample was selected from participants of the Trainner Academy located in Tangara da Serra, State of Mato Grosso. Included were: adolescents aged 12 to 16 years old, who have never participated in a body combat ™ class, have a medical certificate for the practice of physical exercise, and agreed to be the subjects of research. Exclusion criteria were: participants who practiced some kind of martial art, were absent on the day, or did not complete the training class.

Procedures

The validated Lista de Estados de Ânimo - Reduzida e Ilustrada (LEA-RI) questionnaire[24], was applied before and after school in two stages of the investigation. It

included a list consisting of 14 adjectives (happy/joyful; heavy/tired/loaded; nice; sad; spiritual/dreamer; light/mild; full of energy; active/energetic; agitated/nervous; unpleasant; calm/peaceful; useless/apathetic, shy, and scared), a four intensities scale (4=strong, 3=strong, 2=some, very little=1), and was illustrated by means of a figure's facial expressions for each adjective. This instrument determines moods in different populations and its concurrent validity is confirmed in children, the elderly and people with low education[24].

The group of adolescents participated on two Fridays with a one week interval between operations in order to remove the effect of contamination between the groups regarding the learning process. The body combat ™ classes lasted one hour, starting at 18:00 and ending at 19:00 hours, and used the five key educational elements as the body of the training manual systems™: pre-choreography, physical implementation, instruction, role playing and interactive communication[8].

Classes were held in the Academy Trainner fitness room located in Tangara da Serra, State of Mato Grosso. The prescription of the classes was applied by the same teacher. The class in the first week was held without music (COM), and in the second week of practice the class used music (CWM). To practice the CWM a microphone was used, and a DVD player connected to the amplifier and CD Mix Programme 30 supplied by Body Systems™.

The legal guardians of the participants all signed a free and clarified term sheet, duly approved by the Research Ethics Committee (number 658/CEP-HUJM/09).

Statistical analysis

Analysis was performed normal distribution using the Shapiro-Wilk test, and absolute and relative frequency was calculated for descriptive statistics. The McNemar test and χ^2 test were used to verify the association between variables before and after CWM and COM, and between variables pre-COM and CWM and post-CWM and COM, with a significance $p<0.05$, that is, 10%, 5% and 1%, confidence interval 90, 95 and 99%, respectively. The number of categories (1 to 4) was decreased for two classifications: Category 1 "very little" and Category 2 "little" were transformed into 1 "weak"; and Categories 3 "strong" and 4 " very strong" were transformed into 2 "strong". We used SPSS v24 software for statistical calculations.

Results

They evaluated 29 adolescents, 18 females and 11 males, aged 12-15 years old. The highest frequencies in the CWM for positive sentiments were "light", "active/energetic," "full of energy", "spiritual", "pleasant" and "happy/joyful". After CWM there was reduction of the following negative feelings: "sad,", "unpleasant", "useless" and "scared" (Table 1).

Table 1. Absolute and relative values for positive and negative feelings in the class without music and the body combat ™ programme class with music for adolescents, held in a gym

Variables		Class without music			Class with music		
	Int.	Pre	Post	p value	Pre	Post	p value
Positive feelings							
Light	Weak	17 (29%)	4 (7%)	0.0801 *	15 (26%)	3 (5%)	0.0153 **
	Strong	12 (21%)	25 (43%)		14 (24%)	26 (45%)	
Active/energy	Weak	3 (5%)	4 (7%)	0.0001 ***	15 (26%)	1 (2%)	0.0019 ***
	Strong	26 (45%)	25 (43%)		14 (24%)	28 (48%)	
Full of energy	Weak	2 (3%)	8 (14%)	0.0023 ***	8 (14%)	5 (9%)	0.0032 ***
	Strong	27 (47%)	21 (36%)		21 (36%)	24 (41%)	
Spiritual	Weak	11 (19%)	19 (33%)	1.0000 ns	19 (33%)	1 (2%)	0.0158 **
	Strong	18 (31%)	10 (17%)		10 (17%)	28 (48%)	
Nice	Weak	12 (21%)	1 (2%)	0.0004 ***	4 (7%)	3 (5%)	0.0000 ***
	Strong	17 (29%)	28 (48%)		25 (43%)	26 (45%)	
Happ/joyful	Weak	1 (2%)	1 (2%)	0.0000 ***	14 (24%)	0 (0%)	0.0003 ***
	Strong	28 (48%)	28 (48%)		15 (26%)	29 (50%)	
Calm	Weak	1 (2%)	4 (7%)	0.0000 ***	11 (19%)	10 (17%)	0.1859 ns
	Strong	28 (48%)	25 (43%)		18 (31%)	19 (33%)	
Negative feelings							
Heavy/tired	Weak	26 (45%)	12 (21%)	0.0388 **	18 (31%)	6 (10%)	0.3319 ns
	Strong	3 (5%)	17 (29%)		11 (19%)	23 (40%)	
Sad	Weak	24 (41%)	26 (5%)	0.0003 ***	18 (31%)	29 (50%)	0.0072 ***
	Strong	5 (9%)	3 (5%)		11 (19%)	0 (0%)	
Agitated/nervous	Weak	19 (33%)	17 (29%)	0.2482 ns	12 (21%)	21 (36%)	0.6265 ns
	Strong	10 (17%)	12 (21%)		17 (29%)	8 (14%)	
Unpleasant	Weak	28 (48%)	28 (48%)	0.0000 ***	27 (47%)	29 (50%)	0.0000 ***
	Strong	1 (2%)	1 (2%)		2 (3%)	0 (0%)	
Useless	Weak	22 (38%)	27 (47%)	0.0011 ***	27 (47%)	28 (48%)	0.0000 ***
	Strong	7 (12%)	2 (3%)		2 (3%)	1 (2%)	
Shy	Weak	15 (26%)	18 (31%)	0.5958 ns	12 (21%)	29 (50%)	0.1048 ns
	Strong	14 (24%)	11 (19%)		17 (29%)	0 (0%)	
Scared	Weak	18 (31%)	24 (41%)	0.0425 **	18 (31%)	29 (50%)	0.0072 ***
	Strong	11 (19%)	5 (9%)		11 (19%)	0 (0%)	

Note: Values presented with the McNemar test and χ^2 test, significance was $p < 0.05$, and *, **, *** represent statistical significance at 10%, 5% and 1%, significant with interval confidence 90, 95 and 99%, respectively. Int. = Intensity.
Source: The authors

After the COM, the teenagers reported a decrease in adjectives: "active/energetic," "full of energy", "spiritual," and "calm", and an increase in the "light" adjective and "nice". There was an increase in the adjectives "tired" and "agitated/nervous", and a decrease in the "unpleasant" adjectives "useless," "shy" and "scared ".

When applied to music (CWM), the adolescents reported the following sensations: increased adjectives "happy/joyful", "spiritual", "active/energy" and "light" for the positive feelings; and increased "tired" adjectives, and a reduction in the adjectives "sad," "unpleasant", "useless", "shy" and "scared" as negative feelings. It is evident that music

contributes the following feelings for teenagers: "happy/joyful" and "spiritual", increases use of the adjective "active/energy" while keeping the "light" adjective (Figure 1).

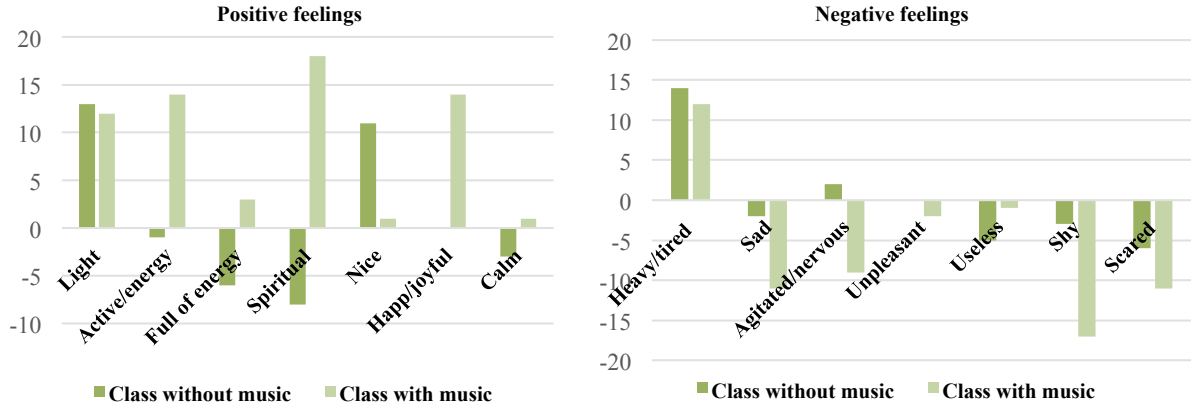

Figure 1. Descriptive characteristics of positive and negative feelings of adolescents in the class without music and with music of programme body combat™

Source: The authors

The comparative figures for the pre- and post-intervention COM moments in positive feelings were "light" (p=0.005), "active/energy" (p=0.003), "full of energy" (p=0.0006), and "calm" (p=0.000); and the negative feelings "tired" (p=0.0020), "sad" (p=0.0061) and "shy" (p=0.0004).

The comparative figures in the pre- and post-intervention of the CWM for positive feelings were "light" (p=0.0000), "active/energy" (p=0.0263), "spiritual" (p=0.000) and "happy/joyful" (p=0.0001); and negative feelings "tired" (p=0.0001), "sad" (p=0.0008), "unpleasant" (p=0.0013) and "useless" (p=0.0389) (Table 2).

Table 2. Comparing pre- and post-intervention classes without music and the class with body combat ™ music among teenagers held in gym

Variables	Class without music (COM)			Class with music (CWM)		
Positive feelings	Pre vs post	It is made	Sig.	Pre vs post	It is made	Sig.
Light	0.0053	+	**	0.0000	+	**
Active/energy	0.0035	-	**	0.0263	+	*
Full of energy	0.0006	-	**	0.4699	+	ns
Spiritual	0.3576	-	ns	0.0000	+	**
Nice	0.0791	+	ns	0.0903	+	ns
Happy/joyful	0.1573	-	ns	0.0001	+	**
Calm	0.0000	-	**	0.2369	+	ns
Negative feelings						
Heavy/tired	0.0020	+	**	0.0001	+	**
Sad	0.0061	-	**	0.0008	-	**
Agitated/nervous	0.5102	+	ns	0.1220	-	ns
Unpleasant	0.2253	-	ns	0.0013	-	**
Useless	0.0680	-	ns	0.0389	-	*
Shy	0.0004	-	**	0.0001	-	**
Scared	0.1610	-	ns	0.0001	-	**

Note: Values χ^2 test, significance was $p < 0.05$; * Significant at 5%; ** 1% and the mean ns = not significant.

Source: The authors

Discussion

The present study demonstrated that the results obtained with the LEA-RI have identified moods of adolescents after to practice the body combat™ lesson. They showed an increase in positive adjectives after performing the CWM compared to not using music. There was a reduction in negative adjectives and decreased fear in CWM, showing increased psychological security. These findings corroborate previous research in adults[22] and the elderly[25,26].

In this study, COM increased the intensity of the adjective "nice" and "light" probably because exercise creates a sensation of well-being after practice. The intensities of the "light", "active/energy", "spiritual" and "happy/joyful" feelings increased after the CWM, probably due to the effect of music. Several studies have found that exercise performed in the presence of music is able to enhance moods, due to its motivational action [22,23,27]. This is in addition to reducing the monotony of repetitive exercises and the discomfort resulting from physical activity, in which the individual perceives the environment as more enjoyable[28], causing a sensation of joy and lightness during the CWM.

It is assumed that the increase in the "full of energy" adjective after CWM is due to the change in pace from slow to fast music, similar to findings from another study[29]. These authors concluded that the music accompanying the intensity of exercise movements, can increase the ability to work, in order to make it less monotonous exercise.

The negative feelings "sad," "unpleasant", "useless" and "shy" were significantly lower after the CWM because body combat ™ is a programme that uses electronic music, which is the most preferred for the practice of resistance training in gyms[30]. That is, moderate to high exercise intensities, when songs are properly selected, may weaken feeling of sadness, and worthlessness, making them safer and more pleasant subjects. These findings corroborate studies[15,20,31]which concluded that music reduces negative feelings to decrease the perception of effort. It is able to activate the prefrontal area of the cortex, reducing perceived exertion, improving performance, and speeding up recovery after exercise[32].

The "tired" feeling was significantly elevated in two sections of the class, a result explained by the exhausting effect of exercise, however, the increase was significant for CWM. In this case, the initial effects of music may decrease during prolonged exercise at a higher intensity, because the physiological conditions begin to dominate the processing capacity of the nervous system[27]. In line with this result[29], it was found that the ergogenic effects of music may persist in the course of repeated intervals during interval sprint training, but also that this effect appears to diminish over the course of the session. So music is stimulating for a moment but is not able to minimise fatigue during more extensive practice.

The Fernandes study[33], found that the level of moderate and vigorous physical activity contributed to the self-esteem and body satisfaction of adolescents. Xue et al.[34] related a happy mood, sad mood and neutral mood of university students of according with preference musical styleSad melodies and slow rhythms are associated with feelings of sadness, and happy and agitated melodies are associated with feelings of happiness. Therefore, when the participants had neutral feelings, the preference was for both melody rhythms. Adolescents with negative self-esteem will thus benefit from the use of music during physical activity, electrifying, similar to the body combat ™ programme.

It is therefore noted that in addition to analysing and interpreting the factors related to the effect of music during physical activity in isolation, that it is necessary to observe them together in a particular context, in which the performance of the practitioner can improve and hence contribute to increased motivation for the regular practice of certain physical activity.

This finding has clinical implications, since it improves the moods of adolescents, and the use of music accompanying the rhythm of choreography can be an alternative activity

programme and hence can improve the engagement of adolescents with regular exercise. The small number of participants and sessions was a limitation of the study. Studies with larger sample sizes and more sessions with more varying ages should be used, in order to make a comparative study of age and sex, on the effect of exercise learning.

Conclusions

It was found that music enhances sensations of happiness and joy, and also increases spiritual adjectives, increases activity and energy, and increases the state of lightness. It encourages a feeling of tiredness when there is no music and also diminishes sadness and unpleasant feelings, and decreases feelings of worthlessness, shyness and fear.

It is concluded that music during exercise can be motivating for teenagers because it improves moods during a body combat ™ class accompanied by music.

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