

A INFLUÊNCIA DO AMBIENTE SOBRE A PERCEPÇÃO AFETIVA DURANTE EXERCÍCIO FÍSICO SUPERVISIONADO EM INDIVÍDUOS ADULTOS

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Resumo: As respostas afetivas durante os exercícios físicos estão fortemente relacionadas com a aderência e a frequência do treino físico. Além disso, o ambiente em que as pessoas se encontram durante os exercícios físicos é um fator de impacto sobre a aderência ao exercício físico. O objetivo deste artigo é avaliar a resposta afetiva dos indivíduos durante os exercícios físicos em diferentes ambientes, permitindo assim relacionar estas respostas com a aderência ao exercício. Setenta e oito indivíduos com mais de nove meses de prática de exercício físico, com idades compreendidas entre 22 e 64 anos, foram subdivididos em três grupos classificados por ambientes, (*indoor*, n=26), (*outdoor*, n=26) e (misto, n=26). A Escala Feeling Scale of Hard & Rejeski (1989) é uma ferramenta utilizada para medir como os sujeitos se estão a sentir durante a atividade pesquisada. Os dados foram analisados utilizando o teste Kruskal Wallis com o teste Post hoc Dunn's, representado no gráfico e expresso em $\bar{x} \pm SD$, $p < 0,05^*$. Os resultados demonstram que o grupo *outdoor* mostrou níveis mais elevados de afetividade ($4,92 \pm 0,27$, $p < 0,001^*$), quando comparado com os grupos: misto ($4,85 \pm 0,46$) e *indoor* ($3,23 \pm 1,27$). Não há diferença significativa entre os ambientes exteriores e mistos quando se analisa a escala afetiva durante o exercício. Há uma diferença significativa entre o ambiente interior e os outros dois espaços. Conclui-se que os ambientes *outdoor* e mistos são as melhores opções de ambiente para a prática de exercícios físicos quando relacionados a percepção de sentimentos positivos. O ambiente é um fator essencial para a aderência ao exercício físico. Ter contato com a natureza ou alguns elementos da mesma ao fazer exercícios físicos aumenta a aderência à atividade física. Assim, ambiente é um elemento a ser considerado quando se planeia um programa de exercício físico.

Palavras-chave: Exercício Físico; Afetividade; Aderência; Outdoors

Afiliação

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THE INFLUENCE OF THE ENVIRONMENT ON AFFECTIVE PERCEPTION DURING SUPERVISED PHYSICAL EXERCISES IN ADULTS

Abstract: Affective responses during physical exercises are strongly related to adherence and frequency of physical training. Also, the environment people are in during physical exercises is an impacting factor on the levels of affective responses and, consequently, adherence. Yet, the influence of the spaces used to exercise is still scarce. This article aims to evaluate individuals' affective responses during physical exercises in different environments, thus enabling the condition to relate these responses to exercise adherence. Seventy-eight individuals with more than nine months of physical exercise practice, aged between 22 and 64 years, were subdivided into three groups classified by environments, (indoor, n=26), (outdoor, n=26) e (mixed, n=26). The Feeling Scale of Hard & Rejeski (1989) is a tool used to measure affect and how the subjects are feeling during the researched activity. The data were analysed using the Kruskal Wallis test with the Post hoc Dunn's, represented in the graph and expressed in $\bar{x} \pm SD$, $p < 0,05^*$. The outdoor group showed the highest levels of affectivity (4.92 ± 0.27 , $p < 0.001^*$), when compared to the groups: mixed (4.85 ± 0.46) and indoor (3.23 ± 1.27). There is no significant difference between the outdoors and mixed environments when analysing the affective scale during exercising. There is a substantial difference between the indoor environment and the other two spaces. In conclusion, the outdoor and mixed environments are the best ambience options for practising physical exercises when related to their perception of positive feelings. The environment can be an essential factor for adherence to a physical exercise program. Having contact with nature or elements of it when doing physical exercises raises adherence to physical activity. Thus, this is an element to be considered when planning a physical exercise programme.

Key words: Physical Exercise; Affectivity; Adherence; Outdoors

Introduction

Affective responses during physical exercises are strongly related to adherence and frequency of physical training and have a significant portion in the literature (1-12). In addition, affection is an emotional and mental state and presents itself as a relevant natural indicator for people in several aspects. This indicator is relevant for people to interact continuously with other individuals and with the environment around them (13). Thus, existing studies (14, 15) suggest that positive levels of affective responses during physical exercise can influence the maintenance of people doing physical activity programs.

Affection is also a constituent part of human nature and a central element in people's consciousness and behaviour when related to the environment, whether in natural or planned spaces (13, 16). Therefore, the environment occupies an important part in the global understanding of the behaviour of individuals and their affection; yet it seems to be less common to debate the influence of the environment on people's adherence to physical exercise program practices. Nevertheless, there are studies that address the impact of the environment on body practices, whether these are barriers or incentives for the regular practice of exercise programs (17, 18).

The measurement of levels of affectivity has been investigated in different aspects, such as aerobic exercises (19), volume and intensity (20-22), the organisation in training sessions (23), different types of resistance training (24) and comparison between levels of affectivity in different environments (25, 26). As established up to date, studies that assess the influence of the environment as an impacting factor on the levels of affective responses and, consequently, on adherence to exercise are still scarce. Thus, due to the relevance of the environment on physical exercise and the maintenance of active behaviour, this study intends to contribute to the literature in that regard.

To the purpose of this study, the indoor space corresponds to a collective gymnastic room in a gym, the chosen outdoor space was the beach environment, specifically in soft sand, and the mixed environment is related to a functional exercise studio with strong visual elements of nature. Although this studio is a closed (indoor) space, there are large windows that allow direct visual contact with nature, which characterise the mixed environment in this paper.

Indeed, there seems to be a synergistic relationship between the practice of exercises performed in an outdoor environment and the positive psychological effects it has on

individuals, such as affection (27). It is possible to suggest that these positive effects happen due to the connection between the subject and nature (28). Although there are different aspects that can influence adherence to physical exercises, there is a previous study (26) that established that individuals' psychological effects could be altered according specifically to the environment in which they are performing their physical exercise.

The objective of this study is to evaluate the influences of affective responses on adherence to physical exercise in different environments, testing the hypothesis statement that collective exercises performed outdoors would generate higher levels of affective responses from practitioners.

Materials and Methods

Research type

This research is a descriptive field study of the cross-sectional since the variables investigated were evaluated only once. Furthermore, the enterprise in question is situated in the field of quantitative research, since it works with values and intensities.

Sample characterisation and research environment

This investigation took place in three different environments: a private gym (indoor), a functional training studio (mixed environment), with specific characteristics, and a functional training group on the beach (outdoors). The indoor location used to collect data in this research was chosen randomly. For the mixed location, an environment was sought in the researched city that had the necessary characteristics for this research, such as natural light, large windows with visual contact with nature (nature) and internal space that allows mobility. For the training environment studied on the billboard, a group considered that had a high number of students due to the sample size.

Data collection was carried out in collective physical exercise programs in all researched environments. This sample was divided equally between indoor, outdoor, and mixed environments. The subjects were trained in the researched particular environment previous to the research data collection. Data was collected in their usual place of training.

The sample calculation was performed using the Simple Random Chi-Square Distribution Method (χ^2):

$$n = \frac{\chi^2 * N * P * Q}{e^2 * (N - 1) + \chi^2 * P * Q}$$

Where: n = sample size to be calculated;

χ^2 = Chi-Square (3,8416);

α = 10% = 0,1 => Significance Level with $(1 - \alpha) = 90\% = 0,9$ => Trust level;

N = Total number of people who participated in this physical activity gym (991);

P = 0,5 = 50% to succeed;

Q = 0,5 = 50% of failure;

e^2 = 0,1 = 10% (Sampling error).

Therefore:

$$n = \frac{3,8416 * 991 * 0,5 * 0,5}{(0,1)^2 * (990) + 3,8416 * 0,5 * 0,5} = \frac{951,7564}{9,9 + 0,9604} = \frac{951,7564}{10,8604} = 87,63$$

Based on the representation of the population who participated in physical activity in gyms, there were 87 (eighty-seven) subjects. However, during the research process, 9 (nine) people who had initially committed to data collection, stopped attending the gym. Therefore, 78 (seventy-eight) adults participated in the present study, 40 (forty) men and 38 (thirty-eight) women (Table 1). They were all physically active with over one year of adherence to physical exercise in the chosen exercise program. Thus, all subjects part of this research were investigated in place of their regular physical training. In addition, chosen for the study, individuals who had a minimum of three times a week frequency in their physical activity. Also, individuals affected by Mood Disorders were excluded because of cognitive distortions that affect the subject's judgment.

This study used three instruments to obtain the information and to characterise the sample: Initially, a collection of objective and discursive information, the objective of which was to classify the research participants through an age and training profile. In **table 1**, it is possible to see the questionnaire variables.

Table 1: Characterization of the subjects

Subjects	<i>Indoor (1)</i>	<i>Outdoor (2)</i>	<i>Mixed (3)</i>
Gender	14M-12F	14M-12F	12M-14F
Age	39.96 (22-64)	37.69 (26-63)	35.34 (22-50)
Total adhesion time	11.65 (2-40)	6.73 (1.5-20)	6.82 (1-10)
Average time per session	55.38 (40-90)	54.42 (45-75)	50.96 (45-60)
Days per week	4.5 (3-6)	4.92 (3-7)	4.84 (3-5)
Choice of location	24 Yes-2 No	24 Yes-2 No	25 Yes-1 No
Preferred location for physical activity	21 Yes-5 No	23 Yes-3 No	24 Yes-2 No
Total subjects	26	26	26

Legend: a) the gender category is put here as a number (N) (Male-Female); b) the adhesion time is expressed in years; c) the categories Number of modalities and Number of locations are expressed in (minimum-maximum); d) the average time per session is expressed in minutes.

As it is possible to note in table 1, most of the subjects were trained in their place of choice and their preferred location. Even with some subjects practising their physical exercises in their location of interesting, affective positive results were also found in these subjects while training. No other variables such as time per session, exercises, intensity, rest time and other information about the training variability were controlled. This information was collected and used as a characterization of the subjects and their routine.

Ethical approval

All the participants signed the Free and Informed Consent Form, based on the precepts governed by the Resolution of the National Health Council 466, of December 12, 2012, which approves the guidelines and regulatory standards for research involving humans. The Ethics Committee of the Health Sciences Centre of the Federal University of Paraíba approved this research under the number 2.353.296. Individuals were also informed that participation would be voluntary and that they could give up on the research without any need to justify it.

Instrument

The Feeling Scale of Hard & Rejeski (1989) was used to measure the affective response during physical exercise (29). This quantitative tool was chosen due to the number of previous

studies which demonstrated that this scale could be highly associated with positive feelings and greater adherence to exercise. This scale is composed of a unipolar, positive or comfort measure, on a Likert scale, from 11 points (-5 to +5), of a single item, ranging from “Terrible” (-5) to “Excellent” (+5). On this scale, the number “0” (zero) represents a state equivalent to neutral. The Feeling Scale of Hard & Rejeski (1989) has been commonly used to measure affective responses during physical exercises. This scale has been previously related to other tools for measuring affective responses (30, 31).

For this investigation, the Likert scale from the “Feeling Scale” was adapted to numbers from zero (0) to ten (10), whereas five corresponded to neutral, zero to “Terrible” and ten to “Excellent”. By having only positive numbers, this research intended to make the instrument easier for the subjects to understand and identify their feelings during physical activity.

Instructions referring to the Feeling Scale of Hard & Rejeski (1989) were presented to the volunteers following the model used in previous investigations (8, 25, 32), and then applied once during the exercise of each subject. Therefore, the feeling scale was applied one time only during the training session around half of the training.

Data analysis

The statistical treatment referring to the Feeling Scale of Hard & Rejeski (1989) was used for both the analysis and treatment of data. The Kolmogorov-Smirnov test was then used to assess whether there was a normal distribution of data (33, 34). After confirming the results, which did not present a normal distribution, the Kruskal Wallis test was used with the Post hoc Dunn’s. This analysis compared all groups, analysing the Feeling Scale of Hard & Rejeski (1989) with the data collected from people in the three environments. A level of significance was set at $p \leq 0.05^*$, with data expressed in $\bar{x} \pm SD$ and the three groups involved in this study, were evaluated. The statistical program Sigma Stat for Windows 10 - Version 2.0 of Jandel Corporation, was used.

Results

With the objective of evaluating the affective response of individuals during physical exercises in different environments, this research states that the outdoor environment showed the highest levels of affectivity (4.92 ± 0.27 , $p < 0.001^*$), followed by the mixed environment (4.85 ± 0.46) when compared to the indoor environment (3.23 ± 1 , 27) (**Image 1**).

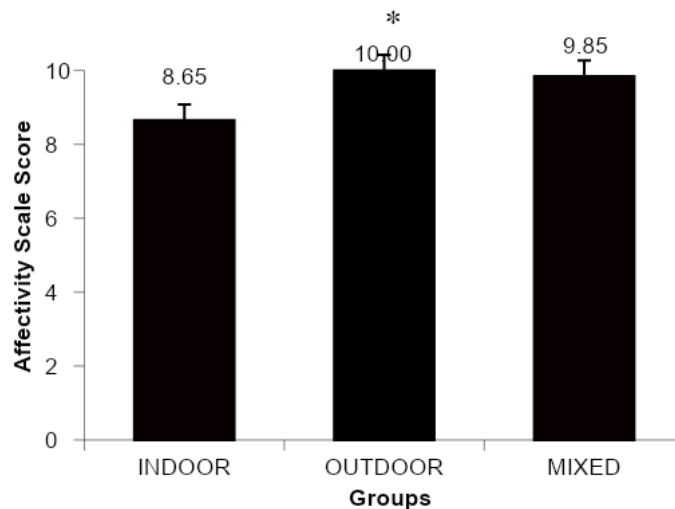


Image 1 – Scale of affectivity – Feeling scale per environment

Source: data of the study; Legend: Measure of comparison of the levels of affectivity between the researched environments. The levels of affectivity were evaluated in three environments, being equally distributed among $n = 26$ individuals for each environment, totalling $n = 78$ individuals represented here graphically. The level of significance adopted was $p \leq 0.05^*$.

Discussion

As this research is a cross-sectional study that may limit the investigation by not comparing results within multiple days. Although the aim of this research is to understand the importance and differences of the environment in training routines and adherence, other variables such as intensity and volume of the training may interfere with the feeling scale.

The levels of affective responses can be influenced by different aspects, such as levels of social interaction during the practice of physical exercise (3). This interaction must be considered when analysing the results. Although the collection of the affective level during the exercise was individual, the environment of the practice refers to a group configuration. This factor could present a deviation of values in the scale.

To equalise data, the same modality was analysed in the three research environments, which leads one to believe that the three environments had the same possibility of interference. The collection was performed during the practice of group exercises. For this reason, this research is significant, given it allows an analysis of the environment during physical exercise.

The fact that three different environments were researched means that there was a control group, which is done by the other two locations. Thus, it is assumed that the study has relevant dimensions for the field of Physical Education and associated areas. Yet, further studies are needed to further understand the influence of the environment on the levels of

affectivity during exercising.

Previous studies have already compared different environments concerning physical activity and behaviours related to lifestyle (6, 18, 35-37), suggesting that a higher understanding of the environment related to levels of affectivity during exercise is important and necessary. Substantial academic advances have been made regarding the environment as a driving force in increasing positive perceptions. These increases have occurred, especially regarding mental and physical influences of the outdoor environment on people, or merely the fact of being outdoors (38-40).

There was a significant effect of the environment in the alteration of affective responses in the research conditions. The outdoor environment showed the highest levels of affectivity, followed by the mixed environment. Outdoor and mixed environments did not show significant statistical differences between them. Contrastingly, these two environments showed substantial differences when compared to indoor space (Graphic 1).

The results allow us to understand that being in an open environment (outdoor), or still being in an enclosed space, however, with marked visual presence of the external natural environment (mixed), increases the levels of affection compared to closed environments. The benefits of exercise in an outdoor environment discussed in this research are effective in both short and long term in agreement with previous publications (37).

It is also valid to emphasise that the levels of affectivity were positive, regardless of the researched environment. Although the outdoor and mixed environments had significantly higher values, people in the indoor environment also reported high perceptions of affectivity. This factor can be considered in the analysis of the subjects when considering adhering to physical exercise. The high levels of affection are regularly related to positive feelings and satisfaction and can be linked to adherence to training programs in adults. The relationship with adherence can be associated with the positive perception of the action (11).

People in the indoor space also presented a positive perception during physical exercise. However, the lower levels of perception of affectivity and the interview statements showed unfavourable feelings toward this environment, especially when compared to the other environments. Therefore, this environment presented itself as an easy-access option for users. However, data lead to questioning about the relevance of this when related to adherence to a physical exercise program.

In this regard, this article emphasises the importance of considering the environment when planning and performing a physical exercise program; or even changing it, in case the

individual does not continue the program. In addition, they can be related factors: the intensity, the modality, the type of monitoring and the results achieved during these practices.

Previous studies reinforce the importance of the environment in the acute responses to exercise, going beyond a purely biological sphere. According to a previous study (25), the presence of natural elements in the environment can cause a positive change in affective responses during physical exercise. This article also suggests that contact with nature, even in a visual way, contributes to higher levels of affectivity, corroborating with previous studies (25, 28, 32, 36). Thus, the outdoor and mixed environments are relevant for adherence to physical exercise programs, with higher levels of affectivity than the indoor environment.

Conclusion

This paper concludes that the environment can be an essential factor for the continuity of a physical exercise program since different environments provoke different perceptions and responses to the feelings and types of statements presented. Therefore, the subjects perceive the outdoor and mixed environments are the best ambience options for the practice of physical exercises when related to their perception of positive feelings, which represents a connection to adherence to physical activity.

In general, all individuals presented positive affective perceptions in the three environments, which shows that people are performing exercises in the positive condition of choosing the location. The study also suggests a synergistic effect of physical exercises concerning the environment.

Future studies can measure this affectivity scale, by comparing it with other modalities, such as individual physical exercises and even other types of monitoring. It can also be considered that gaps in the perception of affectivity during and after exercises are essential for understanding the entire process, which may be the subject of research in future projects.

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