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EFFECTS OF THE SYSTEMATIC PRACTICE OF A SWIMMING PROGRAM ON THE SELF-PERCEPTION OF PHYSICAL AND MENTAL QUALITY FOR PROFESSIONAL PERFORMANCE

Almir Marchetti
Gustavo Borges Methodology of Formative Swimming, São Paulo, SP, Brazil
http://lattes.cnpq.br/8351773369807487

Willian Urizzi de Lima
Faculdades Metropolitanas Unidas - FMU, São Paulo, SP, Brazil
http://lattes.cnpq.br/6605938878814560

Adriano Gomes
Gustavo Borges Methodology of Formative Swimming, São Paulo, SP, Brazil

Ana Maria Gaino Pinheiro
Gustavo Borges Methodology of Formative Swimming, São Paulo, SP, Brazil
http://lattes.cnpq.br/1552590480038624

Fabrício Madureira
Metropolitan University of Santos - (FEFIS/UNIMES), Santos, SP, Brazil
http://lattes.cnpq.br/0533411944711731

Abstract: The potential of systematic exercise on human health has been widely investigated, however, its effects on working hours seem to be very dependent on the type of program, so studies that deepen this knowledge on specific intervention models should be investigated. The aims of this study were: to investigate the effects of a swimming program on self-perceived physical and mental quality for professional performance; to detect the magnitude of the effects in relation to frequency, time of practice and volume swum; and to investigate whether the time of training has an influence on perceived performance. The results indicate that the training model investigated proved to be efficient in positively influencing concentration, productivity and disposition at work. In addition, for the respondents, the program influenced their self-esteem, reduced illness and relieved stress.
Keywords: swimming, work performance, physical and mental quality

INTRODUCTION

The works of Pinker (2011), Rosling, Rosling and Rönnlund (2019) and Bregman (2018) reflect on the improvements in the quality of human life over time. The first author describes how the rates of different types of violence have decreased significantly around the world, and the subsequent authors devised the *gapminder* tool, which shows significant improvements in different variables such as ageing, basic sanitation, education, global enrichment in the world, as well as in different countries.

Bregman (2018) coined the expression *"beginning of infinity"* to illustrate how human beings have learned to live longer and better over time. Specifically, with regard to working hours, the author presents data from the International Labour Organization, which has identified a crucial drop in workers' working hours over the decades, enabling sufficient earnings to stabilize and secure family growth, which on the one hand seems very promising, given the possibility of increased time for entertainment, but on the other hand, there has been an increase in the acquisition of material values and easier access to technology, which has contributed to increased levels of anxiety and stress, especially those arising from the inability to disconnect from work relationships.

According to Harari (2015), the human mind reacts to an achievement not in search of satisfaction, but rather, the desire for more - and the negative consequences of this side effect are increased levels of anxiety and stress (CANDIDO & SOUZA, 2017), which greatly affect the immune system (RICHTEL, 2020), making the body more susceptible to infections from viruses and bacteria. One of the strategies that has proven effective in combating this type of problem seems to be maintaining optimal levels of physical activity. According to Gil-Beltrán et al (2020), physical exercise is a habit that not only has consequences for physical and mental health, but can also have positive consequences for business organizations, because according to the authors, physical exercise makes it easier for employees to recover from the physical, mental and emotional effort made during the working day, which can result in higher levels of engagement the following day.

In order to maximize the above findings, intervention models have been proposed such as those presented by Nooijen et al (2019) and Calderwood et al (2020), the latter investigating the balance between the perception of a good quality of life and work, specifically the impact of the time of day for physical exercise, however, the levels of intensity, duration of the sessions, as well as the frequencies of practice seem to influence the magnitudes of the effects (SIMPSON, et al. 2020). In this way, the constant deepening of this line of research can provide more robust knowledge on the varied interactions of exercise and a better quality of working day.

OBJECTIVES

To investigate the effects of a swimming program on the self-perception of physical and mental quality for professional performance;

Detect the magnitude of the effects in relation to frequency, practice time and volume swum.

METHODOLOGY

Sixty-nine people practicing a specific swimming program took part in the experiment, 38 men and 31 women with an average age of 41.2 (12.5) years. All of them voluntarily answered a questionnaire formulated via *google forms*, containing questions related to the profile of the practitioner, the characteristics of their practice with the program, the reasons that led them to enroll and maintain their adherence to the training sessions, as well as their self-perception of the effects of this practice on their work performance and on their physical and mental health.

The participants who had been training systematically for over a year were 91.3% (63); 7.2% (5) had been practicing between 7 months and 1 year and only 1.4% (1) for less than 6 months. The swimming program known as the Gustavo Borges Methodology (MGB) consists of four phases in adult swimming: adaptation, initiation and conditioning I and II. In this study, the respondents were specifically at the last three levels, which will be described below.

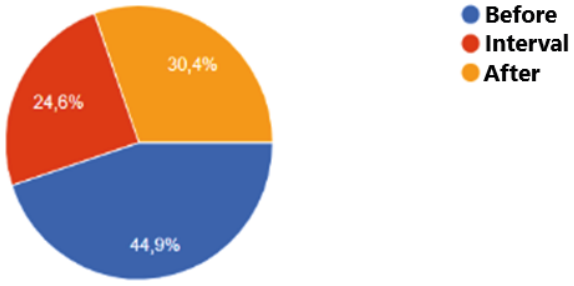
Beginners - This level is aimed at experiencing and learning the fundamental aquatic skills, starting with the construction of the four swims. The objectives are: to swim rudimentary crawl with glide synchronization; to perform the edge exit and simple turn of the crawl stroke; to swim rudimentary backstroke with opposition synchronization; to perform the edge exit and simple turn of the backstroke; to swim rudimentary breaststroke with glide synchronization; to perform the undulation and improve aquatic competence.

Conditioning I and II: These levels are centered on the perspective of Quality of Life and Health and the objectives include: to have regular physical exercise as a habit; to show gains in physical abilities; to show a taste for water sports for physical conditioning and as an option in leisure activities; to adjust their swimming rhythm according to the requested length; to master the subjective perception of effort; to keep track of swimming times and intervals between sets using the edge stopwatch; to improve swimming efficiency; to combine activities in water and on land with the aim of improving physical abilities: strength, power, localized muscular endurance and cardiovascular endurance.

STATISTICS

The data is presented descriptively based on the relative and absolute frequencies of the volunteers' responses. Pearson's correlation test was used to analyze the magnitudes of the relationship between time, frequency and volume swum in the perceptions investigated. Finally, the chi-square test was used to analyze the frequency of different variables

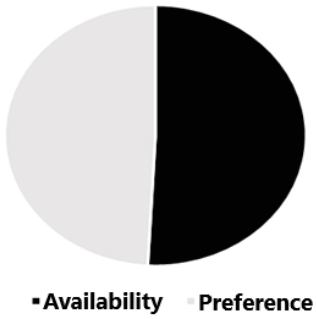
RESULTS AND DISCUSSION



Graph 1. Frequency of responses regarding the time of training and the working day.

The data above shows that 31 of the participants practiced before work, 21 after work and 17 in between.

The following data answers the question of what influenced the decision to practice.



Graph 2. Frequency of responses as to why they train at a specific time

Specifically, with regard to the reasons for the practice schedules, there were answers that were concentrated in two groups that were identified as preference and availability. Examples of preferences among the answers were: "To start the day in the best way, providing me with well-being for the whole day"; "I feel calmer about professional and personal activities, but mainly because it helps to relieve the stress of the job" and "I feel more willing throughout the day". The answers related to availability included phrases such as: "I need to adapt my schedule", "It's a time I can schedule myself most of the time so I don't miss classes" and "Work routine".

Despite indications that systematic exercise has a potential effect on performance during the working day (GIL-BELTRÁN et al., 2020), as well as on workers' mental health (NOOIJEN, et al, 2019), getting people involved in exercise is still a major challenge (ACSM, 2016). In this study, the participants were involved in swimming and when asked about their choice of sport, they gave answers such as: "PASSION"; "favorite sport"; "I love swimming"; "challenging sport"; "taking part in competitions"; "I've been doing it since childhood" - indicating an emotional relationship; however, answers such as: "medical indication" and its associations; "non-impact modality"; "arthrosis"; "bronchitis" - characterizing that the choice of modality was centered on pleasure and need, reasons that are almost indispensable for maximizing engagement with exercise, and which corroborate with the study developed by Hunter and Wu, (2016) whose title bears the expression "*give me a better break",* where the authors detected that when employees could choose their activities, they showed greater perception of health and better responses to emotional exhaustion and job satisfaction.

When the respondents were asked about the characteristics of the class that enhanced their involvement with the program, recurring answers were: "teacher" - which appeared in more than 1/3 of the answers; "challenging classes"; "diversified" and expressions that indicated the pleasure of being in interaction with others, such as: "I like people"; "group stimulus"; "training in partnership"; "nice people"; "friends"; "lively group"; "team companionship". These results indicate a strong triad between the importance of the teacher, the structure of the class and personal relationships.

The following is an in-depth look at the frequency and volume of swimming variables. Of the participants in this experiment, 29 (42%) practiced more than three times a week, 19 (27.5%) - three times a week, 17 (24.6%) twice and 4 only once. In addition, 39 (56.5%) of the respondents swam more than 2,000m per session, 15 (21.7%) up to 2,000m, 12 (17.4%) up to 1,500m and 3 up to 800m. These results show that almost 70% of the sample achieves the minimum recommendations for good health through swimming lessons (WHO, 2020) and the length swum by 78% of the sample identifies significant volumes per training session.

The subsequent analyses focus on the volunteers' perception of the effects of swimming lessons on the physical and mental aspects of their working day.

DiJt - Disposition during the working day;
Ct - Work concentration; Pt - Work productivity

EpPN	Inf. a lot	Influenced	Infrequently	No Infl.
DiJt	60,9%	34,4%		4,7%
Ct	50,7%	34,8%	4,5%	10
Pt	38,7%	49,8%	11,5%	

Table 1. Practitioners' perception of the magnitude of the influence (Infl.) of the swimming training program (EpPN) on the working day.

The data indicated that 90% of the participants perceived the influence of systematic practice with the MGB training program, specifically on their willingness to face their working day. These results corroborate the findings of Pronk et al (2004) who investigated 683 workers, where the dependent variables included the number of days of work loss, quantity and quality of work performed, overall work performance, extra effort exerted and interpersonal relationships. The results, according to the authors, indicated that workers with higher levels of physical activity were related to a higher overall quality and performance of work; greater cardiorespiratory fitness was related to the quantity of work performed and a reduction in the extra effort expended for the same task; conversely, higher levels of obesity indicated greater difficulty in relating to co-workers, as well as a greater number of days away from work.

Although studies are consistent on the systematic effect of exercise on brain health and plasticity, indicating simultaneous improvements in cognitive performance - regulated by brain-derived neurotrophic factor - BDNF (FORTUNE et al, 2019; MORENO-COLLAZOS & ORTI, 2018), there is still a need for studies that can analyze its impact on workday performance. In the present study, the results showed that for self-perception in the concentration of their work, 35 participants responded that it influenced them a lot; 24 that they perceived it influenced them; 3 respondents that it influenced them a little and 7 did not perceive any influence. For the perception of work productivity, the data indicated that 59 respondents reported that being involved with the swimming program increased their work productivity and 10 indicated that they perceived little or no influence. It can therefore be said that for more than 80% of the sample, the MGB program was effective in boosting productivity at work.

The aforementioned findings are in line with the work carried out by Wollseiffen, et al (2016), who reported a positive impact on physical health resulting from the practice of exercise, also showing an improvement in cognitive performance during the working day. In their study, the authors examined the influence of different types of breaks on the cognitive performance and cortical activity of office-based employees. The types of breaks included exercise, rest and a control condition where the employees continued working without any breaks. Cognitive performance was assessed using the D2-R test, which is an instrument that assesses the ability to concentrate and sustain attention, basically consisting of selecting target symbols from among similar symbols, under time pressure - the test stands out for its measurement accuracy in attention and concentration constructs. In addition, cortical activity was recorded using electroencephalography before and after the breaks, and the mood of the workers was analyzed using a mood profile. The results indicated positive effects of exercise with short 3-minute boxing interventions on cognitive performance, mirrored by a decrease in prefrontal cortex activity. With regard to aerobic exercise lasting 20' at 70% of maximum heart rate, the findings indicated an increase in prefrontal alpha-2 activity, which reaffirms the positive effect of exercise on neurocognitive performance. For the authors, health and economic benefits can result from short breaks for physical activity, helping to maintain performance and satisfaction in the workplace.

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AE - self-esteem; Dd - reduced illness; Dst - reduced stress

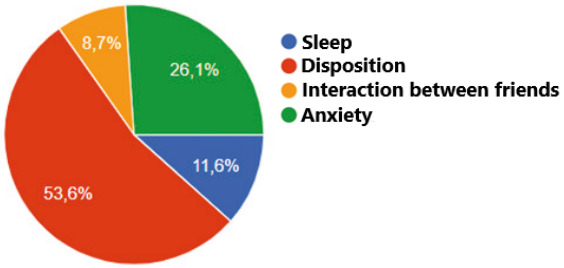
EpPN	Inf Very	Inf	Inf Little	No InfI
AE	66,7%	26,1%	6%	1,2%
Dd	53,3%	37,7%	9%	
STD	73,9%	21,7%	4,4%	

Table 2 Practitioners' perception of the effects of the swimming training program (EpPN) on general health.

Self-esteem (SE) is a perceived characteristic, normally associated with a positive cascade effect, i.e. people with high SE tend to be more self-confident, which in turn favors resilience, which is directly related to self-efficacy. The data above shows that 46 participants indicated that the swimming program had a great influence on EE; 26 said it did and 5 identified little or no influence. The results were significant, indicating that more than 90% of the sample perceived the influence of the training program on EE, corroborating the findings of Mousavi and Dasshipour, (2017) where the authors used the 58-item Coopersmith inventory to measure the EE of 84 male students who participated in an aerobic exercise program, among the results, significant increases were identified in the experimental group for the average self-esteem score, which went from 32.36 to 42.89, indicating the effect of exercise on this variable.

As for reducing illnesses, the data above shows that 37 participants believe that the swimming program has a great influence; 26 that it has an influence and 6 that it has little or no influence. The findings confirm positions such as those of the Brazilian Society of Exercise and Sports Medicine (SBMEE, 2020); and the *American College of Sports Medicine* (ACSM, 2020) indicating that regular exercise of moderate to vigorous intensity is potentially beneficial for the immune system, even in times of pandemic such as the one experienced this year - COVID-19. In particular, Simpson et al, (2020), highlight a general consensus that regular sessions of moderate-intensity exercise of short duration (i.e. up to 45 minutes) are beneficial for the host's immune defense, particularly in older adults and people with chronic diseases.

With regard to stress, the data allows us to infer that 66 of those assessed reported a significant influence from the practice of swimming lessons and only 3 volunteers responded that they perceived little or no effect, in addition, the reduction in stress increased disposition in 37 of those assessed, and decreased anxiety in 18 of the respondents. The results also corroborate the data presented by Larisch, et al (2020), who investigated more than 300 workers from different offices, and the results indicated that higher levels of physical activity of moderate to vigorous intensities were associated with greater mental well-being of workers and, therefore, lower stress.



Graph 3. Practitioners' perception of the variable most influenced by stress reduction

In view of what has been said so far, another question that has arisen is whether the group investigated had their perceptions influenced by the length of time they had been practicing the swimming program, the weekly frequency of training and/or the average volume swum per day, given that evidence points to both chronic and acute effects of exercise.

Tp - Time spent practicing; FS - Weekly frequency; Mnst - Distance swum per training session; Ct - Work concentration; AE - Self-esteem; Dd - Decrease in illness; DiJt - Willingness to work; Pt - Work productivity; Dst - Decrease in stress.

		Tp	FS	Mnst	Ct	AE	Dd	Dijt	Pt	DiSt
Tp	R	1	,167	,256*	-,062	,004	-,079	-,169	-,017	-,186
	p		,171	,034	,611	,972	,521	,164	,888	,127
FS	R	,167	1	,485**	-,093	,009	,233	-,032	,013	,073
	p	,171		,000	,448	,939	,054	,791	,917	,552
Mnst	R	,256*	,485**	1	-,059	,163	,095	-,084	,066	-,061
	p	,034	,000		,630	,180	,436	,492	,592	,617

Table 3. Shows the correlation data between the variables related to the training program and the practitioners' perception of the effects on their working day

The results presented indicate that systematic practice in the swimming program was enough to induce positive responses, such as those self-reported, regardless of the length of time practiced, weekly frequency or length swum, so it can be said that the MGB program was effective regardless of the gender practiced.

Finally, when comparing the impact of the time of swimming training (before, during and after) on self-perception of the variables related to working hours and health, no statistically significant differences were identified for any of the variables, Ct p=0.634; AE p=0.0907; Dd p=0.451; DiJt p=0.287; Pt p=0.461 and DiSt p=0.526. These results also confirm what has been said so far, identifying that regardless of the time of training, the results were favorable to the practice of exercise.

CONCLUSION

The results indicate that the training program investigated was effective in positively influencing the participants' perception of concentration, productivity and disposition at work, and that for the respondents the program influenced self-esteem, reduced illness and relieved stress.

Paraphrasing Harari, (2015, p.25), "today, the main source of wealth is knowledge" and aware of the positive effects that specific swimming programs can result in, such initiatives should be encouraged.

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