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A Study on impact of swimming workout for relieving life stress

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Abstract

The intention of this present study is to study on impact of swimming workout for relieving life stress. The target group was the members from Swimming Centre, Sector 14, Rohtak. Self-Rating Depression Scale (SDS) was used to score the members' life stress before and after swimming exercise. Data analysis included both descriptive statistical methods and paired sample t-test. This study has reached two conclusions as follows: (1) Males aged 21-44 with an occupation are usually night swimmers. (2) Swimming helps relieve life stress. This study thus suggested people to do swimming exercise in order to efficiently reduce stresses in their lives.

Keywords: Swimming Workout, Life Stress.

Introduction

Stress is a fact of nature in which forces from the inside or outside world affect the individual, either one's emotional or physical well-being, or both. The individual responds to stress in ways that affect the individual, as well as their environment. Due to the overabundance of stress in our modern lives, we usually think of stress as a negative experience, but from a biological point of view, stress can be a neutral, negative, or positive experience.

In general, stress is related to both external and internal factors. External factors include the physical environment, including your job, your relationships with others, your home, and all the situations, challenges, difficulties, and expectations you're confronted with on a daily basis. Internal factors determine your body's ability to respond to, and deal with, the external stress-inducing factors. Internal factors which influence your ability to handle stress include your nutritional status, overall health and fitness levels, emotional well-being, and the amount of sleep and rest you get.

Stress has driven evolutionary change (the development and natural selection of species over time). Thus, the species that adapted best to the causes of stress (stressors) have survived and evolved into the plant and animal kingdoms we now observe.

Man is the most adaptive creature on the planet because of the evolution of the human brain, especially the part called the neo-cortex. This adaptability is largely due to the changes and stressors that we have faced and mastered. Therefore, we, unlike other animals, can live in any climate or ecosystem, at various altitudes, and avoid the danger of predators. Moreover, we have learned to live in the air, under the sea, and even in space, where no living creatures have ever survived.

A key to the understanding of the negative aspects of stress is the concept of milieu interieur (the internal environment of the body), which was first advanced by the French physiologist Claude Bernard. In this concept, he described the principles of dynamic equilibrium. In dynamic equilibrium, constancy, a steady state (situation) in the internal bodily environment, is essential to survival. Therefore, external changes in the environment or external forces that change the internal balance must be reacted to and compensated for if the organism is to survive. Examples of such external forces include temperature, oxygen concentration in the air, the expenditure of energy, and the presence of predators. In addition, diseases are also stressors that threaten the constancy of the milieu interieur.

The neurologist Walter Cannon coined the term homeostasis to further define the dynamic equilibrium that Bernard had described. He also was the first credited with recognizing that stressors could be emotional, as well as physical. Through his experiments, he demonstrated

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the "fight or flight" response that man and other animals share when threatened. Further, Cannon traced these reactions to the release of powerful neurotransmitters from a part of the adrenal gland, the medulla. (Neurotransmitters are the body's chemicals that carry messages to and from the nerves.) The adrenal medulla secretes two neurotransmitters, epinephrine (also called adrenaline) and norepinephrine (noradrenaline), in the response to stress. The release of these neurotransmitters leads to the physiologic effects seen in the fight or flight response, for example, a rapid heart rate, and increased alertness.

Hans Selye, another early scientist who is known for his studies of stress, extended Cannon's observations. He included the pituitary gland, a small gland at the base of the brain, as part of the body's stress response system. He described how this gland controls the secretion of hormones (for example, cortisol) that are important in the physiological response to stress. Additionally, Selye actually introduced the term stress from physics and engineering and defined it as "mutual actions of forces that take place across any section of the body, physical or psychological."

In his experiments, Selye induced stress in rats in a variety of ways. He found typical and constant psychological and physical responses to the adverse situations that were imposed on the rats. In rats exposed to constant stress, he observed enlargement of the adrenal glands, gastrointestinal ulcers, and a wasting away (atrophy) of the immune (defense) system. He called these responses to stress the general adaptation (adjustment) or stress syndrome. He discovered that these processes, which were adaptive (healthy, appropriate adjustment) and normal for the organism in warding off stress, could become much like illnesses. That is, the adaptive processes, if they were excessive, could damage the body. This observation, then, was the beginning of an understanding of why stress, really over stress, can be harmful, and why the word stress has earned such a bad name.

Methods

Research Tool

This study adopts questionnaire survey using Self-Rating Depression Scale (SDS) designed by Zung in 1965. The value of Cronbach's α under 0.81 is generally acceptable. Ten positive questions and ten negative questions are randomly arranged in the questionnaire. Each question is scored on a scale of 1 to 4. The sum of the score should be between 20 and 80. Score 20-39 is Normal Range; 40-47 is Mildly Depressed; 48-57 is Moderately Depressed; 56 and above is Severely Depressed.

Survey Execution

Questionnaires were dispatched on a daily basis from 6 pm to 9 pm, May 21st 2015 to June 5th 2015. Members consented to fill out an SDS (pre-test) before entering the pool whilst coming to Swimming Centre, Sector 14 Branch, Rohtak. The subjects were then asked to complete another SDS (post-test)

with the same questions after finishing swimming. There were 86 members filling out the questionnaires. Having screened out 8 incomplete questionnaires, we received a total of 78 complete questionnaires. (Finishing a pre-test and a post-test SDS is accounted for one complete questionnaire.) The target group was the members from Swimming Centre, Sector 14, Rohtak.

Data Analysis

The data were imported and analyzed using Statistical Package for the SPSS. Here are the brief introductions to the statistical methods used in this study.

- Frequency distribution of descriptive statistics, which is displayed using percentages, is used to depict personal information of the subjects.
- Paired sample t-test is used to analyze the variation in cognitive life stress before and after swimming.
- The significance level of this study is $\alpha=0.05$.

Results

Demographic Analysis

Table 1: Demographic Analysis of the Subjects

Variable	Group	Number(Persons)	Percentage (%)
Gender	Male	52	66.66 %
	Female	26	33.33 %
Age	21-32	42	53.84 %
	33-44	36	46.15 %
Occupation	Business	27	34.61 %
	Industrial	17	21.79 %
	Service	34	43.58 %
Education	Senior High	4	5.12 %
	College	36	46.15 %
	University	38	48.71 %

Among a total of 86 questionnaires recovered, 78 shares are valid questionnaires shown as Table 1. Participants include 52 males and 26 females with respective percentage of 66.66 and 33.33. Age group 21-32 has 42 subjects (53.84%), and 36 out of 78 subjects (46.15%) are aged between 33 and 44. Working in the business sector has 27 subjects (34.61%), industrial sector has 17 subjects (21.79%), and service sector has 34 subjects (43.58%). Graduating from senior high schools has 10 subjects, 30 subjects were graduated from colleagues, and over 38 subjects were graduated from universities with the share of 5.12%, 46.15% and 48.71% respectively.

Status of Cognitive Life Stress before and After Swimming

This study adopted questionnaire survey (pre-test and posttest) using Self-Rating Depression Scale (SDS) to investigate the possibility of reducing stress by participating in swimming exercise. They would fill out an SDS (pretest) before entering the pool, and another SDS (post-test) with the same questions after finishing swimming.

Table 2: Depressed Status of Subjects on Cognitive Life Stress before and After Swimming

Status	Before (Persons)	After (Persons)
Normal (score 20-39)	31	55
Mildly Depressed (score 40-47)	12	14
Moderately Depressed (score 48-57)	27	9
Severely Depressed (score 56 and above)	8	0
Average	44.23	32.86

Table 2 shows the number of subjects and their scores on the cognitive life stress before and after swimming. There were 31 subjects fell in the Normal range, 12 subjects felt mildly depressed, 27 subjects felt moderately depressed, and 8 subjects felt severely depressed in cognitive life stress before swimming. With the average score 44.23, the statistics illustrated that the subjects were mildly depressed before swimming exercise. After swimming, the subjects who have already changed dry clothes were asked to fill out another questionnaire (post-test) with the same questions. 52 subjects felt Normal, 14 felt mildly depressed, 12 felt moderately depressed, and only 0 felt severely depressed. With the average score 32.86, the statistics displayed that the subjects felt less depressed after swimming exercise.

Gap Analysis of Cognitive Life Stress before and After Swimming

To learn the benefits of swimming exercise to life stress reduction, this study adopted paired sample t-test to analyze the variation in cognitive life stress before and after swimming. As shown in Table 3, the average score for cognitive life stress before swimming is 44.23, whereas it is 32.86 after swimming. The t ratio is 12.69, and the p value is less than 0.05, which has reached the significance level. This shows the fact that the score for cognitive life stress before swimming exercise is significantly higher than that of after swimming exercise.

Table 3: Gap Analysis of Cognitive Life Stress before and After Swimming

	Average	S.D	't' value
Before	44.23	11.57	12.69
After	32.86	8.89	

p < .05

Discussion and Conclusions

Discussion

This study has found that males tend to participate in swimming exercise more often than females do among the subjects, the age distribution, mostly between 21 and 44, in this study might be influenced by the time the survey was conducted and the subjects' willingness to fill out the questionnaires. All the subjects had a job. Less than 6% of the subjects did not obtain a bachelor degree, reflecting the high education level in Rohtak. The score of cognitive life stress before swimming exercise showing mildly depressed represented that the public has felt stressed living in a fast-paced society. Compared with the score obtained after swimming exercise, the result showed that the number of subjects feeling moderately depressed decreased by 18 people from 27 to 9 people. The number of subjects who felt severely depressed before swimming exercise also fell from 8 to 0 after swimming exercise. The findings in this study, where people participating in swimming exercise believed that cognitive life stress could be greatly reduced via swimming exercise.

Conclusion and Suggestion

To sum up, this study has reached the two conclusions as follows. (a) Night swimmers are usually males aged between 26 and 39. (b) Participating in swimming exercise helps improve life stress, and has positive effects on the participants' mental health. Therefore, it is recommendable that people do swimming exercise to reduce stress. Since the research conducted in this study only focuses on a single participation in swimming exercise, it is advisable that future research

continue to explore the connection between stress and swimming frequency further.

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