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Chih-Cheng Chen

Department of Sport
Management, Aletheia
University New Taipei City,
Taiwan.

Yen-Whea Kuo

Center for Physical Education,
Aletheia University New Taipei
City, Taiwan.

Kuang-Tsan Hung

Department of Physical
Education, De Lin Institute of
Technology New Taipei City,
Taiwan.

Tsun-I Hsiao

Center for Physical Education,
Aletheia University New Taipei
City, Taiwan.

Chih-Jen Chuang

Department of Sport
Management, Aletheia
University New Taipei City,
Taiwan.

Bo-Yu Chen

Department of Sport
Management, Aletheia
University New Taipei City,
Taiwan.

Yan-Ting Yeh

Department of Sport
Management, Aletheia
University New Taipei City,
Taiwan

Correspondence:

Chih-Cheng Chen

Department of Sport
Management, Aletheia
University New Taipei City,
Taiwan.

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The effect of swimming exercise on life stress relief

**Chih-Cheng Chen, Yen-Whea Kuo, Kuang-Tsan Hung, Tsun-I Hsiao,
Chih-Jen Chuang, Bo-Yu Chen, Yan-Ting Yeh**

Abstract

The purpose of this study is to explore the effect of swimming exercise on reducing life stress by means of survey questionnaire. The target group was the members from YMCA Wan-Hua Branch. Zung 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 26-39 with an occupation are usually night swimmers. (2) Swimming helps relieve life stress. This study thus recommended people to do swimming exercise in order to effectively reduce stresses in their lives.

Keywords: swimming exercise, life stress, YMCA

1. Introduction

"Life" is highly associated with "stress" in the modern times. Stress is not only a negative emotion that cannot be released properly, but also a mental pressure that comes from the inability of confronting the environment and people surrounded. Scholars indicated that British enterprises lose NT\$60 trillion annually because of stress-related diseases. Fifty to eighty percent of diseases are closely related to stress as well [1, 2]. Living under great pressure might result in negative impact on both mental and physical health, such as obesity, learning capacity and memory decline, high anxiety, depression, hypertension and migraine [3, 4]. Therefore, to learn to reduce stress and balance emotional states is extremely important to our mental and physical health. There are numerous ways to help reduce stress to a great extent, such as having sufficient sleep, talking to friends, participating in leisure activities, and facing problems with a positive attitude [5, 6, 7, 8].

People in Taiwan have long been too busy to take advantage of their leisure time, which not only decreases the work efficiency but also threatens personal health conditions. Since it is a huge loss to the society, many Taiwanese researchers have been concerned about the stress relief issue. Various empirical studies have proven that regular participation in leisure activities helps improve health-related physical fitness levels and mental health, and is the ideal option for stress relief [5, 6, 7, 9, 10]. According to the aforementioned, Taiwanese people, especially those who live in Taipei City, are facing a certain degree of life stress due to fast-paced lives and extravagant cost of housing and living. To stay healthy, prevent mental illness, and increase job performance, the authorities should encourage the public to actively participate in leisure activities such as basketball, baseball, soccer, biking, climbing and hiking. However, these exercises cannot be performed alone or under bad weather. Only swimming is not restricted to the weather or the number of players. In addition, swimming facilities have been fully constructed in every county and city because swimming exercise has drawn the attention from Taiwan's national government. In particular, Taipei City has 12 sports centers and several outsourced school swimming pools. As a result, swimming exercise is the research object of this study since it has not only drawn the authorities' attention but also become a widely popular exercise in Taiwan. The target group was the members from YMCA Wan-Hua Branch. The participants were tested their cognitive live stress before and after swimming exercise via questionnaire survey. Suggestions were provided according to the test result for related institutions and authorities' future reference.

2. Methods

2.1 Subject and scope

The subject of the study aims at members who participated in swimming exercise at YMCA Wan-Hua Branch in Taipei, Taiwan.

2.2 Research Tool

This study adopts questionnaire survey using Zung 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 [11, 12].

2.3 Survey Execution

Questionnaires were dispatched on a daily basis from 6 pm to 9 pm, July 15th 2012 to July 20th 2012. Members consented to fill out an SDS (pre-test) before entering the pool whilst coming to YMCA Wan-Hua Branch. The subjects were then asked to complete another SDS (post-test) with the same questions after finishing swimming. There were 113 members filling out the questionnaires. Having screened out 12 incomplete questionnaires, we received a total of 101 complete questionnaires. (Finishing a pre-test and a post-test SDS is accounted for one complete questionnaire.)

2.4 Data Analysis

The data were imported and analyzed using Statistical Package for the Social Science (SPSS) Chinese version 12.0. 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 $\alpha=0.05$.

3. Results

3.1 Demographic Analysis

Among a total of 113 questionnaires recovered, 101 shares are valid questionnaires shown as Table 1. Participants include 60 males and 41 females with respective percentage of 59.4 and 40.6. Age group 26-32 has 52 subjects (51.5%), and 49 out of 101 subjects (48.5%) are aged between 33 and 39. Working in the business sector has 42 subjects (41.6%), industrial sector has 15 subjects (14.9%), and service sector has 43 subjects (43.5%). Graduating from senior high schools has 8 subjects, 53 subjects were graduated from colleges, and over 40 subjects were graduated from universities with the share of 7.9%, 52.4% and 39.6% respectively. Monthly income between 20,001-30,000 NTD has 34 subjects (33.7%), 65 subjects whose monthly income was between 30,001-40,000 NTD share 63.3%, and only 3 subjects whose monthly income was between 50,001-60,000 NTD share 3.0%.

Table 1: Demographic Analysis of the Subjects

Variable	Group	Number (persons)	Percentage (%)
Gender	1. Male	60	59.4%
	2. Female	41	40.6%
Age	1. 26-32	52	51.5%
	2. 33-39	49	48.5%
Occupation	1. Business Sector	42	41.6%
	2. Industrial Sector	15	14.9%
	3. Service Sector	44	43.5%
Education	Senior High	8	7.9%
	College	53	52.4%
	University	40	39.6%
Income (NTD per month)	1. 20,001-30,000	34	33.7%
	2. 30,001-40,000	64	63.3%
	3. 50,001 and over	3	3.0%

3.2 Status of Cognitive Life Stress before and After Swimming

This study adopted questionnaire survey (pre-test and post-test) using Zung Self-Rating Depression Scale (SDS) to investigate the possibility of reducing stress by participating in swimming exercise. Members of YMCA Wan-Hua Branch consented to participate in this survey whilst coming to YMCA Wan-Hua Branch. They would fill out an SDS (pre-test) 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)	43	64
Mildly Depressed (score 40-47)	7	27
Moderately Depressed (score 48-57)	44	8
Severely Depressed (score 56 and above)	7	2
Average	43.15	31.83

Table 2 shows the number of subjects and their scores on the cognitive life stress before and after swimming. There were 43 subjects fell in the Normal range, 7 subjects felt mildly depressed, 44 subjects felt moderately depressed, and 7 subjects felt severely depressed in cognitive life stress before swimming. With the average score 43.15, 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. 64 subjects felt Normal, 27 felt mildly depressed, 8 felt moderately depressed, and only 2 felt severely depressed. With the average score 31.83, the statistics displayed that the subjects felt less depressed after swimming exercise.

3.3 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 43.15, whereas it is 31.85 after swimming. The t ratio is 14.05, 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	Standard Deviation	t
Before	43.15	13.30	14.05*
After	31.83	7.85	
*p<.05			

4. Discussion and Conclusions

4.1 Discussion

This study has found that males tend to participate in swimming exercise more often than females do among the subjects, which corresponds with the previous research conducted in indoor heated swimming pools at Taipei Metro Area where females were relatively reluctant to go swimming than males were possibly because of family responsibility or less confidence in their body shapes. The age distribution, mostly between 26 and 39, 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 10% of the subjects did not obtain a bachelor degree, reflecting the high education level in Taiwan. Most of the subjects' income was between 30,001-40,000 NTD per month.

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 36 people from 44 to 8 people. The number of subjects who felt severely depressed before swimming exercise also fell from 7 to 2 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, corresponds to Wijndalele *et al.* [8] whose research was to discover the association between stress and physical activity frequency among Belgian adults.

4.2 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 with an average income 35,000 NTD per month. (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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