

The Effect of Stretching Exercises Education on Mental Health and Learning Strategies

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Abstract

Introduction: Mental health is a combination of emotional, psychological and social well-being. It affects the way of thinking, feeling and acting. Mental health is very important at every stage of life and it could be affected by physical activity. Therefore in the current study, the effect of stretching exercises education on mental health and learning strategies was investigated.

Methods: In this quasi- experimental study, 100 online management courses students were selected and divided randomly into two groups of exercise and control on the same subject. The exercise group were asked to practice selected stretching exercises that were made available to them as movies on their given break time after 45 min since start of the class before continuing their study again. Both groups answered the Weinstein (2002) learning strategies questionnaire at the beginning and the end of the course. All data were analyzed using SPSS 23. Kolmogorov-Smirnov, paired sample t-test, independent samples t-test, and Pearson correlation coefficient, were used for data analysis ($p \leq 0.05$).

Results: There was a significant difference between learning strategies ($p=0.001$) in two groups of exercise and control. Also the subscales, attitude ($p= 0.003$), information processing ($p= 0.001$), study aid ($p= 0.003$) and time management ($p= 0.001$) had a significant changes on post-test.

Conclusion: Improvement of mental health increases the effect of learning strategies. Applying stretching exercises on educational content can improve mental health which results in increasing the productivity of work and achieving educational goals.

Keywords: Mental Health, Learning Strategies, Stretching Exercises, E-Learning

Introduction

In a situation where the branches of specialized sciences are increasing, learning process plays a major role in teaching and learning different skills (1, 2). Although people's talent and intelligence and creativity are involved in this process, factors such as location, time, education, facilities and equipment, motivation in the learner, subjective well-being and, generally speaking, teaching methods cannot be denied (3). In the course of teaching, there are always students who, despite having the natural intelligence and required potential, have difficulty in acquiring scientific skills in accordance with their potential, and are confused in learning

the skills given to them as assignments (4). Ineffective learning, in addition to economic losses, will lead to problems such as lower self-confidence, feelings of humiliation, depression and, as a result, the lack of full prosperity of the talents and abilities of an individual who has failed in education can be mentioned. Mental health is one of the factors affecting various aspects of human life, especially on students' academic development (5). Currently, many educational studies, as well as more teacher training hours, focus on how to deliver lessons to maximize learning (6). Weinstein and Mayer (1986) define learning strategies as methods in which learners in the learning process, through them, choose to acquire information and then

integrate them. They classify learning strategies into cognitive strategies and meta-cognitive strategies and believe that cognitive strategies are used to facilitate learning tasks, while meta-cognitive strategies are required to review this progression are used (7). In other words, according to Weinstein (2011), cognitive strategies are used for advancement and achievement of cognitive goals, and metacognitive strategies are used to monitor these processes (8). In general, learning strategies include attitudes, motivation, time management, anxiety, concentration, information processing, selecting main idea, study aid, self- testing and test strategies (8). The component of attitude examines students' interest in college and education. The motivation scale focuses on the level of self-regulation and willingness to work hard in performing academic tasks. Time management provides the appropriate planning for the use of time for all academic tasks. Anxiety Scale shows students' concerns about their place of study and their performance and increasing anxiety risks their mental health. The concentration scale shows the student's ability to pay attention to academic tasks and courses. The scale of information processing indicates the use of expansion, the monitoring of the level of understanding and reasoning, and the scale of choice of the main idea, focused on the ability to get important points in the lesson in the study. The study aid scale focuses on the use of supportive techniques or materials that can help learn and keep track of information. The self-testing scale examines the effort to review and prepare for the class and the exam, and ultimately examines the scale of test strategies, test preparation strategies, and how to respond to the test (8). These strategies include the hidden and obvious thoughts and behaviors that are successfully associated with learning, and learners use certain strategies for learning when faced with a variety of learning tasks. Studies in the field of cognitive psychology have shown that learning strategies improve student academic performance by facilitating learning and increasing mental health; therefore, teaching in the 21st century attempts to address strategies that lead to the development of learning (9). Making learners interested to engage in academic activities through cognitive and meta-cognitive strategies is a topic that should

be considered by the practitioners of the higher education system. Considering the tremendous impact of innovations in improving the quality of education and providing the public facility to access information and higher education, a new approach to education has been proposed under the title of e-learning, in which, using computer technology facilitates the access to databases and resources, and tries to distribute education at a wider level, with better quality and without spatial and temporal information (10, 11). Meanwhile, recent sensory-motor theory, learning and progress, have identified the pivotal importance of motion and physical activity in the development of cognition (a sensory experience for the development of intelligence capability). Researchers believe that they can develop cognitive knowledge by using physical activity and by training people with control of the level of stress, controlling their emotions and their condition (12). Movement has a psychological, adaptive, and interpersonal importance. The brain that does not get enough education, thinking, and mobility remains stagnant, and loses the power of thought; thinking itself is a kind of movement. In recognition cell biology, it has shown that constructing an intellectual idea or even thinking about a particular subject causes certain molecular and cellular changes in the brain. Neuroscientists have concluded that human knowledge has a completely biological nature, and the more human brain's neurons communicate between the centers of understanding, speech and movement, the higher the human intellectual ability. Mental activities, learning and exercise interact with each other, and they are effective in providing mental health, thinking and decision making, self-confidence, personality development and socialization (13). Exercise and physical exercises give the brain more oxygen, so the amount of learning is improved and strengthened after exercise and stretching movements. Exercise is a simple yet extensive behavioral practice that activates sequential signals associated with diverse cellular and molecular central nervous system processes (14). The effect of exercise on the nervous system and memory is one of the issues that have been considered in recent years. In a study by Mashhadi *et al.* (2009) with the aim of determining the effects of exercise on learning, consolidation and memory recall,

they found that short-term exercise (10 days) and long-term (3 months) before education, increase delayed time in passive avoidance learning, but after training, there was no effect on latency compared to before exercise. Therefore, it can be said that physical activity and exercise have a positive effect on memory and learning (15). Also, Shirdel (2013) found that there was a positive relationship between superficial and deep learning strategies and academic achievement, as well as between the goal of engagement and superficial and deep learning strategies and self-efficacy, but between there was a negative relationship between work avoidance and self-efficacy (16). It is important to note that e-learning is a novice industry in Iran in line with distance learning technology and education centers and educational institutions, especially universities, are working to provide as soon as possible a model appropriate to the country's educational and cultural structure (17). In addition to the advantages of the nature of e-learning, one of the most important reasons for the organizing e-learning centers and institutions in Iran is the increasing demand for education, especially higher education in the country, due to the limited resources and educational capacity in the educational system, the current one has become a particular social issue. Despite the advantages of e-learning in the educational system of the country, it is important to note that the need and dependence of users of this system on the use of computers and the lack of mobility during long and prolonged hours, there are many problems with the loss of body organs, particularly, skeletal muscle, reduction in physical fitness, reduction in the amount of stimulation and increase in fatigue. Headaches from immobility, excessive dazing on the screen, and neck and back muscle damage are very common in these people, and learning and concentration are reduced. The results of e-learning evaluators indicate that many of them do not have adequate concentration during education, and physical exhaustion due to long-term sit-ups on the computer leads to their refusal to continue learning (18). Therefore, evaluating students' readiness, attitudes, learning rate, quantity and quality of education, implementation of e-learning is necessary to take into account the identified weaknesses and strengths, it is possible to

lower the cost of e-learning with better quality And more accurately. Promoting knowledge and skills of human resources by using a modern and affordable program is one of the most important goals of electronic learning. Given that little research has been done in this area, reaching this point requires extensive studies on the feasibility and need for e-learning. The researcher added some stretching exercises in the electronic content of training subject in order to provide and enhance learner's mental and physical health. Therefore, the present study aimed to investigate the effect of stretching exercises education on mental health and learning strategies.

Methods

This study considering the timespan of the study, is longitudinal and considering the method of data collection is quasi experimental, and the pre-test, post-test test with the control group was used to examine the results of a selected sporting exercise period on the students. The statistical population of this study was 140 e-learning students who worked with the web-based electronic content production system, and 100 of them were randomly selected as available statistical samples and divided into two groups of 50 people (namely exercise and control groups). The data collection instrument included a demographic questionnaire and a questionnaire for learning strategies of Weinstein (1987). The questionnaire includes 77 items that covered motivation, attitude, time management, anxiety, concentration, information processing, main idea selection, study aid, self test and test strategies. The reliability of this questionnaire for 10 mentioned factors was equal to 0.77, 0.89, 0.73, 0.79, 0.86, 0.89, 0.82, 0.81, 0.91 and 0.94. Subjects in the exercise group, in each session after forty-five minutes of e-learning, followed a seven-minute training program and then proceeded to continue their studies. Subjects in both groups responded to the questionnaire of learning strategies at the beginning of the study and after three months at the end. All data were analyzed using SPSS for windows (version 23). The results of pre-test and post-test in each group were compared by t-test and analyzed using paired sample and independent sample t-test ($P \leq 0.05$).

Results

The result of personal characteristics of subjects showed that about 42 percent of the subjects were male and 58 percent were female. Forty six percent of students were aged between 22 to 25 and 14 percent of them were aged between 30 to 33 years with average of 24.54 (SD=1.98). Regarding the normality of the variable and its components using Kolmogorov-Smirnov test, parametric statistical tests were used. The results of the independent sample t- test showed no significant difference in the learning strategies of the two groups of exercises and control ($t=0.678$, $p=0.18$). According to Table 1, among the components of learning strategies, in both groups in the pre-test, the highest mean score belonged to the study aid component (3.95) and the lowest mean score belonged to the test strategy component (2.26) and In the post test, the highest mean score belonged to the study aid component (4) and the lowest

mean score belonged to the test strategy component (2.12). The results of independent sample t- test in Table 1 showed a significant difference in the learning strategies of the two groups ($t=9.57$, $p=0.001$). The results of paired sample t- test in Table 1 showed that there was no difference between the mean scores of learning strategies ($t=5.468$, $p=0.26$) in the control group that received only electronic education. Whiles, in the exercise group after stretching exercises education, there was a significant difference in the mean scores of learning strategies ($t=0.95$, $p=0.001$). This significant difference was observed in the components of learning strategies including attitude ($t=3.75$, $p=0.003$), processing ($t=4.313$, $t=0.001$), study aid ($t=3.086$, $p=0.003$) and time management ($t=3.305$, $p=0.001$) were observed.

Table 1. The results of independent sample and paired sample t- test for review the changes of Learning Strategies

Learning Strategies scales	Group	Pre-test	Post-test	Paired sample t-test	Independent sample t-test
Anxiety	Control	2.58 ± 1.29	2.63 ± 1.42	$t=1.08$, $p=0.28$	$t=0.468$,
	Experimental	2.52 ± 1.21	2.76 ± 1.34	$t=0.28$, $p=0.77$	$p=0.63$
Attitude	Control	2.84 ± 1.94	2.60 ± 0.92	$t=1.49$, $p=0.14$	$t=3.75$,
	Experimental	2.40 ± 0.72	2.64 ± 1.18	$t=2.918$, $p=0.005$	$P=0.003$
Concentration	Control	2.33 ± 1.12	3.34 ± 0.98	$t=0.172$, $p=0.864$	$t=0.33$,
	Experimental	2.27 ± 0.95	3.58 ± 1.10	$t=0.947$, $p=0.348$	$P=0.499$
Information	Control	3.11 ± 1.48	3.56 ± 1.04	$t=3.019$, $p=0.08$	$t=4.31$,
Processing	Experimental	2.86 ± 0.85	3.70 ± 1.19	$t=3.058$, $p=0.004$	$P=0.001$
Motivation	Control	2.90 ± 1.21	3.59 ± 0.85	$t=2.674$, $p=0.06$	$t=0.14$,
	Experimental	3.19 ± 1.18	3.18 ± 1.17	$t=0.474$, $p=0.638$	$P=0.188$
Self-Test	Control	2.57 ± 1.61	3.44 ± 0.92	$t=2.158$, $p=0.36$	$t=0.812$,
	Experimental	2.51 ± 0.73	3.39 ± 1.41	$t=1.107$, $p=0.274$	$P=0.345$
Selecting	Control	2.98 ± 1.85	2.28 ± 0.98	$t=1.338$, $p=0.187$	$t=0.204$,
Main Idea	Experimental	2.50 ± 0.78	2.42 ± 1.07	$t=1.435$, $p=0.158$	$P=0.106$
Study Aid	Control	3.11 ± 1.09	3.80 ± 1.02	$t=0.897$, $p=0.001$	$t=3.086$,
	Experimental	2.87 ± 1.05	4.00 ± 0.82	$t=3.405$, $p=0.374$	$P=0.003$
Time	Control	2.98 ± 0.85	2.61 ± 1.30	$t=2.352$, $p=0.23$	$t=3.30$,
Management	Experimental	2.68 ± 1.78	2.84 ± 1.06	$t=2.373$, $p=0.022$	$p=0.001$
Test	Control	2.11 ± 1.89	2.12 ± 0.95	$t=0.523$, $p=0.603$	$t=0.56$,
Strategies	Experimental	2.14 ± 0.95	2.26 ± 1.13	$t=0.234$, $p=0.816$	$P=0.9$

Discussion

Based on the obtained result of current study, the selected sport stretching exercises

education had an impact on the learning strategies used by e-learning students. They were consistent with the results of the

Golparvar (2014) (19), Saliانه (2017) (18), Golding (2011) (20) and Wen (2011) (12), based on the effect of sport motions on self-regulatory learning strategies. This method focuses on the fatigue and concentration of each person more than the talent in the learning process. The findings of this study are consistent with the recent theories of sensory-motor, learning and advancement, which highlight the importance of movement in cognitive transformation. Mentally and intelligently, this is also noteworthy; the brain that does not get teaching, thinking and mobility, will be stagnant and loses the power of thought (11). Therefore, based on the results of this study, stretching exercise education could be used as an effective way to improve the usage of student learning strategies. Physical movements can directly affect the ability to learn, think and remember (22). According to Wen (2011), motor activity is possible through neural communication throughout the body, and the movement creates conditions that make the body a learning tool. Looking at the brain as a muscle is one of the best ways to maximize brain function through exercise and movement (12). Also, the results of this study showed that there was a significant difference between the mean of using of learning strategies with and without incorporating some selected stretching exercises education, so that the average score of post-test learning strategies significantly increased the pre-test scores. In confirmation of this finding, Caviola (2012) (21), Ozsoy (2009) (13) and Sungure (2007) (23) found that after participating in the physical exercise program, people's cognitive activity has increased, for example, in adults in the public information subscale Wechsler Adult Intelligence Scale Revised (WAIS-R), shows an increase in cognitive change. Stretching exercises can promote some of the aspects of cognitive functioning such as memory, reasoning, problem solving, and spatial perception and the application of learning strategies. By considering the worthy role of using strategies in the level of learning and by considering low level of its usage between students which necessarily reduce their learning level and educational decline, it is recommended that tensile training should be included in the student's curriculum and included as part of the curriculum content

designed in the e-learning system in order to improve the level of learning in students.

Conclusion

E-learning is a new industry in Iran that educational institutions, especially universities, are working to provide essential infrastructure and appropriate model for this type of education. Despite the advantages of e-learning, it is important to note that prolonged and uninterrupted hours in use of computer in this type of education have many problems with low mobility, reduction in the threshold of stimulation and increase fatigue. Based on Current study physical activity can promote mental health which result in improve some of the aspects of cognitive functioning such as memory, reasoning, problem solving, and spatial perception and the application of learning strategies. By Considering that it is recommended to embedded sport exercises educations between hours of learning subject in order to improve the level of learning.

Ethical issues

This study was approved by the South Tehran branch, Islamic Azad University. Before the distribution of the questionnaires, respondents were informed about the purpose of the study. Questionnaires were completed anonymously and confidentiality of the data was maintained.

Authors' contributions

All authors equally contributed to the writing and revision of this paper.

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