http://ijnms.net/index.php/ijnms
e- ISSN: 2686-2123
p- ISSN: 2686-0538
ORIGINAL RESEARCH

STRETCHING EFFECT ON STUDENT LEARNING CONCENTRATION

Siti Indatul Laili[1], Ariu Dewi Yanti[2]
Universitas Bina Sehat PPNI Mojokerto, Jawa Timur, Indonesia
Email: sitiindatul9@gmail.com, ariu914@gmail.com

ABSTRACT

Sitting long in the learning process in the classroom could limit blood and incoming oxygen to the brain so which affects concentration. The purpose of this research was to prove the stretching effect on student learning concentration. The design of this research used a *quasi-experimental* design. The population in this research were all students of class II D3 nursing STIKES Bina Sehat PPNI Mojokerto as 79 respondents in January 2022. The sample of this research were all students of class II D3 nursing STIKES Bina Sehat PPNI Mojokerto 39 respondents in the experimental group and 40 respondents in a control group, with a total sampling technique. The research instrument uses a questionnaire that has been tested for validity and reliability. Data analysis using Wilcoxon signed rank test and Mann Whitney test. Stretching effect on student learning concentration and there are differences in learning concentration in the control and experimental groups, in experimental groups 20 (51%) respondents had high learning concentration before stretching and 38 (97%) respondents after stretching. Stretching makes blood vessels vasodilate, so that blood and oxygen flow to the brain smoothly can increase learning concentration.

Keywords

Stretching, Student, Learning Concentration

INTRODUCTION

Learning is an activity carried out to gain knowledge, skills, thinking, understanding, attitudes, and various other abilities that can influence behavior. Student activities in the learning process in class sit more. Sitting position causes blood to collect under and soles of the feet. Thus, the hamstring muscles harden and the back and neck muscles become stiff and hard (Anderson & Anderson, 2008).

Sitting for too long can limit the blood and oxygen that enters the brain where the circulation of blood and oxygen to the brain runs slower so that it can weaken the brain, slow down brain function and affect concentration. Therefore it is necessary to move or stretch every hour or two. The brain needs to be stimulated and controlled so that

the energy of reasoning or thinking can take place in total, making it easier to capture the meaning and results of knowledge memory stored in the brain optimally (Surya, 2013a).

Stretching is brain stimulation that can help focus the mind so that students' memory can improve and be able to concentrate well. The concentration of learning is the concentration of thought and action on an object being studied by driving away or setting aside everything that has nothing to do with the object being studied. Based on the study of education experts, the cause of the low quality and achievement of a person's learning is largely due to the person's weak ability to be able to concentrate on learning (Surya, 2013b).

Research result (Indrawati, Tirtayasa, & Adiatmika, 2011) in Sanglah Denpasar hospital show before stretching the average score of the work concentration which cover: speed is 26.03, Accuracy 18.01, and constancy is 7.22. And after, the average of score the work concentration covers: speed 15.00, Accuracy 13.50, and constancy 6.23. According to that score could be known that the stretching training and active rest were the work concentration which cover: the speed at 80.06%, accurancy at 61.89%, and constancy at 40.08%. In statistics this study was significant.

Research result**s** (Nafi'ah, Susilo, & Setyoningrum, 2020) *in MTS Ma'arif Nyatnyono Ungaran* show the average learning concentration of adolescents who were given stretching exercises was 9.2308 with a standard deviation of 8.10508.

Stretching will improve blood circulation and relax areas that are tense from sitting too long (Anderson & Anderson, 2008). Stretching, because it relaxes your mind and tunes up your body, reduces muscle tension and makes the body feel more relaxed, helps loosen the mind's control of the body so that the body moves for "its own sake" rather than for competition or ego, feel good, should be part of your daily life (Anderson, 2010). When moving, more calories are burned so that the circulation of blood and oxygen to the brain is smoother. And the muscles will also move to pump blood and oxygen to the brain, thereby triggering the release of chemicals in the brain.

The concentration of learning must be created and made a habit of learning. If there is difficulty concentrating on learning it causes an inability to understand the teacher's explanation during the learning process so learning outcomes are not optimal.

Efforts that can be made to increase the effectiveness of training in increasing learning concentration are a healthy lifestyle that can be started from school. Teachers have the opportunity to teach their students to stretch properly, eat well, and make exercise a part of a healthy lifestyle.

The purpose of this research was to prove the stretching effect on student learning concentration.

METHOD

The design of this research used a *quasi-experimental* design. Data collection is done by assessing the concentration of learning (pre-test) of all students of class II D3 nursing STIKES Bina Sehat PPNI Mojokerto after attending class for 100 minutes. Next, students stretch for 7-10 minutes. After stretching, it is continued by assessing learning concentration (post-test). This research was at STIKES Bina Sehat PPNI Mojokerto in January 2022. The independent variable in this study is stretching and the dependent variable is student learning concentration. The population in this research were all students of class II D3 nursing STIKES Bina Sehat PPNI Mojokerto as 79 respondents. The sample of this research were all students of class II D3 nursing STIKES Bina Sehat

PPNI Mojokerto 39 respondents in the experimental group and 40 respondents in a control group, with a total sampling technique. The instrument used is a questionnaire to student learning concentration with test results 100% valid and reliable with = 0.881. Data analysis using Wilcoxon signed rank test to judge the difference before and after stretching. Mann Whitney test for assessing differences in the learning concentration of the control group and experiment group with $\alpha = 0.05$.

RESULTS

Table 1. Frequency Distribution of Respondents by Gender at STIKES Bina Sehat PPNI Mojokerto in January 2022.

No	Gender	Frequency (F)	Percentage (%)
1	Male	11	14
2	Female	68	86
	Total	79	100

Based on table 1 it is known that the majority of 68 (86%) female respondents.

Table 1. Frequency Distribution of Student Learning Concentration at STIKES Bina Sehat PPNI Mojokerto in January 2022.

No	student learning concentration	Experimental Group				Control Group			
		Pretest		Posttest		Pretest		Posttest	
		F	%	F	%	F	%	F	%
1	Very low	0	0	0	0	0	0	0	0
2	low	5	1	0	0	0	0	3	7
3	Low	1	3	1	3	1	2	1	3
4	moderate	4	3	3	9	3	9	4	5
	High	2	6	3	7	9	8	2	5
		0	5	8				3	8
			1						
	Total	2	1	3	1	4	1	4	1
		0	0	9	0	0	0	0	0
			0		0		0		0
Wilcoxon signed-rank test		ρ=0.00				ρ=0.00			
Mann Whitney		ρ=0.00							

Based on table 2 it is known that in experimental groups 20 (51%) respondents had high learning concentration before stretching and 38 (97%) respondents after stretching. Statistical Wilcoxon sign rank test results ρ = 0.00 which means that there is a stretching effect on student learning concentration.

Based on table 2 it is known that the control group 39 (98%) respondents had high learning concentration on *the Pre-test* and 23 (58%) respondents on *Posttest*. Statistical Wilcoxon sign rank test results ρ = 0.00

Based on table 2 it is known that experiment group 38 (97%) respondents had high learning concentration and the control group 23 (58%) respondents. Statistical Mann-Whitney test results ρ = 0.00 means that there are differences in learning concentration in the control and experimental groups.

DISCUSSION

Based on table 2 it is known that in experimental groups 20 (51%) respondents had high learning concentration before stretching and 38 (97%) respondents after stretching. Statistical Wilcoxon sign rank test results ρ = 0.00 which means that there is a stretching effect on student learning concentration.

During the learning process in class, students are required to attend lectures carefully and be in a sitting position on a lecture bench. In addition, students must also have high concentration and a focused mind so that the material explained by the lecturer is easy to understand.

At STIKES Bina Sehat PPNI Mojokerto schedules lectures for 6 days. The duration of learning process lasts 100 minutes for each subject and can be more than one subject every day. Sitting for a long

time while participating in the learning process can force segments or body parts to be in a state of rest for a certain time and make the joints that support the body position relatively fixed. This condition can cause excessive muscle contractions, stuck muscles, contraction of blood vessels, and blood circulation is not smooth so that the body feels sore, numb, or tingling and can also affect body posture.

Based on table 2 it is known that the control group 39 (98%) respondents had high learning concentration on *the Pre-test* and 23 (58%) respondents on *Posttest*. Statistical Wilcoxon sign rank test results ρ = 0.00

If the muscles contract for a long time without relaxing, it will affect blood circulation and also oxygen transportation throughout the body. If blood is not distributed normally, especially to the brain, it will affect its performance, such as decreased concentration, ineffective communication, and also affect the limbs. Therefore, during the learning process, there needs to be relaxation. Relaxation can help smooth blood circulation, meaning that blood can flow properly to all parts of the body that need it.

Based on table 2 it is known that the experiment group 38 (97%) respondents had high learning concentration and the control group 23 (58%) respondents. Statistical Mann-Whitney test results ρ = 0.00 means that there are differences in learning concentration in the control and experimental groups.

Maintaining smooth blood circulation is something that needs to be done so that the body can function optimally. Efforts that can be made to maintain smooth blood circulation are to do stretching or exercises to stretch the muscles. Stretching is a simple movement that is following the anatomy of the human body so that the function and position of the limbs can return as they should. In this case, stretching focuses more on relaxing or reconditioning the body, just moving it can restore the body's condition after a long time of activity.

In this issue of The Journal of Physiology, Biscontiet al. (2020) provide evidence that, like intense aerobic exercise, passive stretching may be used to improve vascular health. In the study, young healthy subjects performed leg stretches (20 min per leg) five times a week for 12 weeks. Multiple indices of vascular health in the stretched limbs and unstretched regions (e.g. arms) were measured before and after the stretch training. In addition to the anticipated increase in flexibility, subjects exhibited enhanced vascular function in the stretched legs (Gifford, 2020).

At the time of stretching, there is a muscular contraction due to physical activity or body movement to produce energy (Pristianto & Rahman, 2018). During dynamic exercise, the blood vessels in the muscles experience vasodilation, this makes blood flow smoother so that gas exchange also runs better. Blood circulation to the normal muscles of 1-4 cc/100 grams of muscle during exercise increases to 30 cc/100 grams of muscle.

Various physical exercises that increase heart rate can improve blood circulation. Blood functions to deliver oxygen and various useful substances to maintain the function of the body's organs including the brain. Oxygen has an important role in the body including, cells in the brain. Complex nerves in the brain play an important role in controlling cognitive function and memory function.

When the body lacks oxygen or hypoxia, the body will not be able to carry out its functions normally. In this condition, various symptoms will appear, for example in the central nervous system you can experience headaches, confusion, and decreased consciousness, decreased

concentration. Disturbances in a small part of the brain will result in disturbances in cognitive function or memory including concentration.

Research results (Tomoto et al., 2021) show that aerobic exercise training has an impact on cerebrovascular function in patients with amnestic MCI which may contribute to improvements in cognition.
Stretching can also relax or loosen areas that are tense from sitting for too long. Sitting can cause blood to collect in the lower legs and soles of the feet so that the hamstring muscles harden, and the back and neck muscles become stiff and hard.

Research results (Hotta et al., 2018) show during treadmill exercise, blood flow to the soleus, plantaris, flexor hallucis longus, and flexor digitorum longus muscles were significantly higher in the stretched limb compared to the non-stretched contra-lateral limb ($P < 0.05$, respectively).

CONCLUSIONS

In the experimental groups 20 (51%) respondents had high learning concentration before stretching and 38 (97%) respondents after stretching. Statistical Wilcoxon sign rank test results $\rho =$ 0.00 which means that there is a stretching effect on student learning concentration. In that experiment group, 38 (97%) respondents had high learning concentration, and control group 23 (58%) respondents. Statistical Mann-Whitney test results $\rho =$ 0.00 means that there are differences in learning concentration in the control and experimental groups.

REFERENCES

Anderson, B. (2010). *Stretching*. Shelter Publications, Inc.

Anderson, B., & Anderson, J. (2008). *Stretching (Peregangan)*. Penerbit Serambi.

Gifford, J. R. (2020). Stretching-based vascular rehabilitation? it's not a stretch. *Journal of Physiology*, *598*(17), 3537–3538. https://doi.org/10.1113/JP280278

Hotta, K., Behnke, B. J., Arjmandi, B., Ghosh, P., Chen, B., Brooks, R., … Muller-Delp, J. M. (2018). Daily muscle stretching enhances blood flow, endothelial function, capillarity, vascular volume, and connectivity in aged skeletal muscle. *Journal of Physiology*, *596*(10), 1903–1917. https://doi.org/10.1113/JP275459

Indrawati, E. P., Tirtayasa, I. K., & Adiatmika, I. P. G. (2011). Pelatihan Peregangan dan Istirahat Aktif Menurunkan Keluhan Muskuloskeletal, Kelelahan Mata dan Meningkatkan Konsentrasi Kerja Karyawan Rekam Medis Rumah Sakit Sanglah Denpasar. *Jurnal Ergonomi Indonesia (The Indonesian Journal of Ergonomic)*, *1*(1).

Nafi'ah, H., Susilo, E., & Setyoningrum, U. (2020). Perbedaan Efektivitas Senam Otak Dan Senam Peregangan Terhadap Tingkat Konsentrasi Belajar Pada Remaja Di Mts Ma'arif Nyatnyono Ungaran. Universitas Ngudi Walyo.

Pristianto, A., & Rahman, F. (2018). *Terapi Latihan Dasar*. Muhammadiyah University Press.

Surya, H. (2013a). *Cara belajar orang genius*. Elex Media Komputindo.

Surya, H. (2013b). *Strategi jitu mencapai kesuksesan belajar*. Elex Media Komputindo.

Tomoto, T., Tarumi, T., Chen, J. N., Hynan, L. S., Munro Cullum, C., & Zhang, R. (2021). One-year aerobic exercise altered cerebral vasomotor reactivity in mild cognitive impairment. *Journal of Applied Physiology*, *131*(1), 119–130. https://doi.org/10.1152/japplphysiol.00158.2021