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by Dwi Astuti Wahyu Nurhayati

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The Effect of Using Jo-Klimah Hardware and Back-Up Exercises on The Body Flexibility of Madrasah Ibtidaiyah Students

Adi Wijayanto
Universitas Islam Negeri Sayyid Ali Rahmatullah Tulungagung, Indonesia
wijayantoadi@yahoo.com

Muhamad Zaini
Universitas Islam Negeri Sayyid Ali Rahmatullah Tulungagung, Indonesia
mzaini.ishaq@gmail.com

Dwi Astuti Wahyu Nurhayati
Universitas Islam Negeri Sayyid Ali Rahmatullah Tulungagung, Indonesia
dwiastuti507@gmail.com

Abstract

The Physical Education, especially flexibility exercises still used manual training tools and had almost not been touched by computers or information technology, especially body flexibility. Researchers wanted to know about (1) Did exercise using Jo-Klimah hardware affect the flexibility of Madrasah Ibtidaiyah students' body? (2) Did back-up exercise affect the flexibility of Madrasah Ibtidaiyah students'?, (3) Was there a difference of body flexibility between exercises using Jo-Klimah hardware and back-up exercises for madrasah ibtidaiyah students?. This research used a quasi-experimental method with the Posttest-Only Control Group Design. The population in this study were Madrasah Ibtidaiyah students in Tulungagung with a range of 10-11 years, male gender, the sampling method used simple random sampling so that eight Madrasah Ibtidaiyah were obtained as samples. The first result of the research, it showed that training using the Jo-Klimah hardware had a significant effect on the body flexibility of primary school students with a sig value of 0.001 (<0.05). The Second, the back-up exercises also significantly affected the body flexibility of primary school students with a sig value of 0.492 (<0.05). The third, the anova analysis showed that there was a significant

difference in body flexibility between exercises using the Jo-Klimah hardware and back-up exercises for primary school students with the results of the anova test obtaining a value of 0.000668 <0.05. The Students who were doing exercises using the Jo-Klimah tool were very enthusiastic and motivated. Jo-Klimah physiologically caused muscles to stretch and increased the range of motion (ROM). The increase due to back-up training was not as high as the exercise using Jo-Klimah caused by the monotonous form of exercise so that students feel bored and there was no challenge.

Keywords: Exercise, Jo-Klimah Hardware, Back-Up Exercise, Body Flexibility

Abstrak

Bidang olahraga terutama latihan kelenturan tubuh selama ini masih menggunakan alat latihan yang manual dan hampir belum tersentuh perkembangan komputer ataupun teknologi informasi, terutama kelenturan tubuh. Peneliti ingin membuktikan (1) apakah latihan menggunakan hardware Jo-Klimah berpengaruh terhadap kelenturan tubuh siswa madrasah ibtidaiyah?, (2) apakah latihan back-up berpengaruh terhadap kelenturan tubuh siswa madrasah ibtidaiyah?, (3) apakah terdapat perbedaan kelenturan tubuh antara latihan menggunakan hardware Jo-Klimah dan latihan back-up pada siswa madrasah ibtidaiyah?. Penelitian ini menggunakan metode quasi eksperimen dengan rancangan Posttest-Only Control Group Design. Populasi dalam penelitian ini adalah siswa Madrasah Ibtidaiyah yang berada di Tulungagung dengan rentang 10-11 tahun berjenis kelamin laki-laki, menggunakan simple random sampling sehingga didapat 8 madrasah ibtidaiyah sebagai sampel. Hasil penelitian pertama menunjukkan bahwa latihan menggunakan hardware Jo-Klimah berpengaruh secara signifikan terhadap kelenturan tubuh siswa madrasah ibtidaiyah dengan nilai sig 0,001 (<0,05). Kedua, latihan back-up secara signifikan juga berpengaruh terhadap kelenturan tubuh siswa madrasah ibtidaiyah dengan nilai sig 0,492 (<0,05). Ketiga, dengan analisis anava, terdapat perbedaan kelenturan tubuh secara signifikan menggunakan antara latihan menggunakan hardware Jo-Klimah dan latihan back-up pada siswa madrasah ibtidaiyah denagn hasil uji anava diperoleh nilai sebesar 0,000668<0,05. Siswa dalam melakukan latihan menggunakan alat Jo-Klimah tersebut sangat antusias dan bersemangat. Penggunaan alat Jo-Klimah tersebut secara fisiologis menyebabkan otot semakin meregang dan peningkatan range of motion (ROM). Peningkatan akibat latihan back-up tidak setinggi latihan menggunakan Jo-Klimah diakibatkan oleh bentuk latihan yang monoton sehingga siswa merasa jenuh dan tidak ada tantangan.

Kata kunci: *Latihan, Hardware Jo-Klimah, Latihan Back-Up, Kelenturan Tubuh.*

INTRODUCTION

The development of digital technology and information technology in the era of society 5.0 is very rapid in all fields. This development is almost in all realms, at all levels and in all places. These developments are used in helping humans to help overcome and solve problems that arise in life with a very effective and fast time in solving a problem for decision making. One of these developments is the development of computers. A computer is a machine that has been designed to perform several numerical and mathematical operations (Kaur, 2017). Students from basic education to higher education need to be equipped with 4Cs skills including critical thinking skills, creative thinking skills, communication skills and collaboration skills in order to be able to face challenges and solve all problems (Wahyuningsih & Susanti, 2020).

Physical education and sport, especially flexibility exercises, so far, they still use manual training tools and have almost not been touched by the development of computers or information technology, especially body flexibility or togok. A trainer in doing exercises is often less objective due to inaccurate and inaccurate calculations in determining the amount of flexibility training, the less objective assessment makes the training results not optimal. Another problem is when the number of students is very large and the trainers are not comparable or even lacking, so it takes time to carry out a very long training program.

Madrasah is a training ground for students of Madrasah Ibtidaiyah in taking religious, behavioral, and cognitive and psychomotor sciences with the aim of producing the next generation of the nation who has the skills and reliability as well as excellence in various fields. The level of formal Islamic education at Madrasah Ibitidaiyah (MI) is an important part in shaping children's character (Alnashr, 2019). The formation of character and excellence is also found in sports, but flexibility training to support fitness and achievement for madrasah children is almost untouched by technology, especially sports technology. A small number of madrasahs use flexibility exercises, but still use the conventional method. Therefore, in the era of society 5.0, it is necessary to have tools for effective and efficient body flexibility exercises using software and hardware.

Based on the problems above, the researchers wanted to prove (1) Does exercise using Jo-Klimah hardware affects the flexibility of Madrasah Ibtidaiyah students' body?, (2) Does back-up exercise affect the flexibility of the body of

Madrasah Ibtidaiyah students?, (3) Is there any the difference in body flexibility between exercises using the Jo-Klimah hardware and back-up exercises for madrasah ibtidaiyah students?. The researchers hope that this research can improve the development of sports science and use technology to help the development of sports, especially children's body flexibility, as well as provide input that flexibility in Madrasah Ibtidaiyah students must be maintained. The purpose of this study was to determine the effect of training using Jo-Klimah hardware on body flexibility of Madrasah Ibtidaiyah students, knowing the effect of back-up training on body flexibility of Madrasah Ibtidaiyah students, to know how big the difference in body flexibility between exercises using Jo-Klimah hardware and back-up training up to madrasah ibtidaiyah students.

METHODS

This research used a quasi-experimental method with Posttest-Only Control Group Design. The population in this study were Madrasah Ibtidaiyah students in Tulungagung with an age range of 10-11 years, male sex with a weight range of 30 to 40 kilograms and a height between 135 centimeters to 145 centimeters, while the sampling method used simple random sampling, therefore there were eight Ibtidaiyah madrasahs as treatment sampling (three Ibtidaiyah madrasahs as an exercise group using the Jo-Klimah hardware, 3 Ibtidaiyah madrasahs as a back-up training group, and 2 Ibtidaiyah madrasahs as a control group). The sample size was based on calculations using the Higgins & Klinbaum formula obtained at least 32 students in each group. There were 70 students in the treatment group and 35 students in the control group.

The exercises using the Jo-Klimah hardware in this study were flexibility exercises with digital aids using ultrasonic sensors with a microcontroller base, the usefulness of Jo-Klimah as a body flexibility exercise device for children being trained, the value listed directly during the exercise with a digital display. The back-up exercise was a flexibility exercise that was done by pulling the stick back with the initial position on the stomach and both arms behind the head, the exercise was done conventionally and without any assistance.

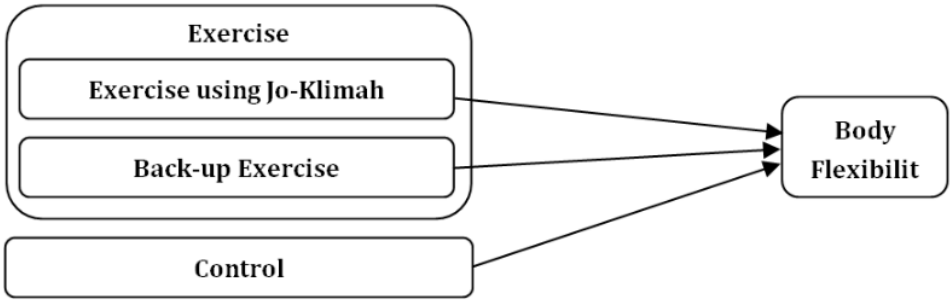

Figure 1. The Research Steps

The frequency of exercise using Jo-Klimah hardware and back-up exercises was 3 times a week with the principle of overloading each set, the number of sets in the exercise was 5 sets of exercises, each set the number of repetitions increases starting with 3 repetitions and at the final meeting were 11 repetitions, where every two training meetings, it increased by one repetition, while the duration in each repetition was 60 seconds. The total number of exercises was 16 exercises. The rest was between reps for 90 seconds or 1.5 times the exercise time in reps.

The data analysis technique used in this study was the Anova Test and the Advanced Test using the Tukey HSD with a confidence level of = 0.05. Prior to the Anova test, a normality test was conducted to determine if the data in the study were normally distributed and also a homogeneity test was conducted to determine if the data was homogeneous. The data processing was carried out with the help of a computer with the IBM SPSS Statistics Data Editor version 21.

RESULTS AND DISCUSSION

The tabulated data was processed using the help of a computer, the data was analyzed descriptively at the beginning and obtained as follows for each group.

Table 1. Descriptive of Data

Group	Mean	SD	Max	Min
Exercise using Jo-Klimah Hardware	42.74	4.138	48.2	34.1
Back-up Exercise	40.27	5.386	48.6	31.7
Control	39.10	5.582	48.6	32.1

The average value of flexibility in the exercise group using the Jo-Klimah hardware was 42.74 cm with the highest value in the group being 48.2 cm and the lowest value in the group being 34.1 cm. In the conventional back-up exercise group, the average value of flexibility was 40.27 cm with the largest value of 48.6 cm and the smallest value of 31.7 cm. While in the control group the average flexibility was 39.10 cm with the highest value of 48.6 cm and the lowest value of 32.1 cm. Thus, by descriptive calculation between the three groups, there was a difference in the average value of flexibility.

The next test was the Anova test with a confidence level of = 0.05. There were two prerequisites before testing ANOVA, namely that the data must be normal and homogeneous first. To find out if the data was normal, it was necessary to first calculate normality using kolmogorov-smrinov.

Table 2. Normality

Group	Statistic	df	Sig.
Exercise using Jo-Klimah Hardware	0.094	70	0.200
Back-up Exercise	0.102	70	0.067
Control	0.146	35	0.058

The Data was said to be normally distributed if the data spread from the right and left ends (so the data spreads from the center of the trend) along the data distribution line. There were many techniques used in the normality test, one of which is the Kolmogorov Smirnov technique. This technique was chosen because the data collected from each of the variables studied was in the form of ratio data which could be transformed into an ordinal scale. Based on the data in the normality table

above, it could be seen that the data in the three groups were normally distributed because the value of Sig.> 0.05.

The second requirement was the homogeneity test to find out whether the three data were homogeneous or not. The homogeneity testing served to determine the variance of the data was homogeneous or heterogeneous based on certain factors. The selection of the homogeneity test using the Levene test was selected because the data tested by the Levene test didn't not have to be normally distributed, but must continue. Homogeneity test using Levene's test obtained the following data.

Table 3. Homogenity

Variable	N	Subset for alpha =0.05	
		1	2
Exercise using Jo-Klimah Hardware	35	39.10	
Back-up Exercise	70	40.27	
Control	70		42.744
Sig.		0.451	1.00

The data obtained based on calculations to determine homogeneity obtained a Sig value of 0.451, thus it could be concluded that the data was very homogeneous because Sig.> 0.05, so the Anova test could be carried out because both conditions had been met.

Table 4. Anova

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	376.51	2	188.257286	7.630482	0.000668
Within Groups	4243.53	172	24.671743		
Total	4620.05	174			

The ANOVA test was conducted to determine whether there was an effect of exercise using Jo-Klimah hardware and back-up exercises on the flexibility of the body of Madrasah Ibtidaiyah students. hardware Jo-Klimah, the group that was trained on flexibility with back-up and the control group on the flexibility results of madrasah ibtidaiyah students with nilap sig.<0.05. With the significance of the flexibility resulted significantly, a post hoc test with the Tukey HSD test must be carried out to find out how big the difference or influence was between the three groups.

The Tukey HSD test that was carried out could describe the magnitude of the difference in flexibility of the students of Madrasah Ibtidaiyah with the results listed in the following table.

Table 5. Tukeys

(I) Kelompok	(J) Kelompok	Sig.
Exercise using Jo-Klimah Hardware	Back-up Exercise	0.010
	Control	0.001
Back-up Exercise	Exercise using Jo-Klimah Hardware	0.010
	Control	0.492
Control	Exercise using Jo-Klimah Hardware	0.001
	Back-up Exercise	0.492

Based on the Tukey HSD table, it could be seen that the value between the group trained in flexibility using the Jo-Klimah hardware and the group trained in flexibility with back-up there was a very significant difference significantly with a value of 0.010 (Sig. <0.05). In the group that was trained in flexibility using the Jo-Klimah hardware and the control group there was a very significant difference significantly with a value of 0.001 (Sig. <0.05). There was no significant difference in the back-up flexibility training group and the control group, this could be seen from the value of 0.492 (Sig.> 0.05).

Flexibility was one of the components of fitness which was defined as the ability of muscles, bones, tendons and joints that are bound together to be used

in the widest possible range of motion without injury and with a comfortable and painless feeling in maximum range of motion. Human movement was strongly influenced by muscles, bones, tendons and joints. The more flexible the joints, the better the movement of the person. Humans live in a world characterized by motion, and for their survival, humans would never be separated from the need for motion. Thus it could be said that motion had the highest position in human life. The quality of human life was also very much determined by the quality of motion that was owned and able to be applied. Natural motion was a potential that every human being had, but to develop the potential for motion into better quality motion, it must go through proper learning or training. Movement control involved the study of the neural, behavioral, environmental, and synergistic mechanisms responsible for human movement and stability. All motor skills, regardless of the skill level with which they were executed and expressions of the motor control system (Jumesam & Hariadi, 2020). The ultimate target of this system was the muscles and joints that were responsible for performing the action. Control was very important for control of movement and control of stability or posture.

Influential factors in producing the level of flexibility included connective tissue, all connective tissue in the body had the same elemental structure. Fibrocytes synthesize proteoglycans and extracellular fibers that form connective tissue, tissue response, joint flexibility and muscle flexibility in a movement, but could be maintained as long as body parts move normally. Connective tissue would maintain its integrity and strength, and remain able to properly withstand the stresses received. Mechanical and Physical Properties of Collagen also affected flexibility, collagen would show its mechanical and physical properties if a change in shape occurs. This property provided an opportunity for collagen to respond to the load received and changes in shape appropriately, and would give the tissue the ability to survive and to strong strain. The mechanical properties were elasticity, viscoelasticity and plasticity.

Muscles, joints, ligaments, fascia and aponeurosis were all composed of collagen, which was thought to be a type of resistance to limited joint range of motion. Tendons, as separate parts of the muscles, were considered a passive inhibiting factor. Only muscles that had an active component could limit the flexibility of the joints to move and the flexibility of the muscles. These components

were referred to as contractile elements, namely myosin and actin. Aging was a process that occurs normally and would continue to affect flexibility. Joint flexibility could decrease with age, which had the potential to affect normal daily function (Stathokostas *et al.,* 2012). During the aging process there would be an increase in the overall content of the tendons, capsules, and muscles along the cross-sectional area of the collagen fibers.

When performing movements involving both dynamic flexibility and dynamic flexibility, or moving the limbs to produce desired skills, the motion control system was responsible for coordinating the activities of more than 600 muscles in the body. How were the muscular commands to perform these movements planned, orchestrated, and executed? Of course, the answer involved the integration of various body systems, including the brain and central nervous system, the muscular system, and the perceptual system but motor control also occurred in certain contexts, including the physical environment, both of which contribute to and inhibit movement activities. In addition, the requirements and nature of the skills being executed further affected the way movement must be controlled. Thus, both the nature of the skill being performed and the context in which it is performed must be taken into account when describing the underlying mechanisms responsible for controlling movement skills.

The kinesthetic sense organs were proprioceptors which include specialized sensory receptors in muscles, tendons, joints and the vestibular apparatus (ie part of the auditory center/labyrinth). Kinesthetic or proprioceptor sense was often referred to as muscle sense because the tension receptors in the muscles were the main source responsible for kinesthetic. The degree of success in performance was often highly dependent on how effectively the performer detects, perceives, and uses relevant sensory information. Often the match winner was the one who was the quickest to detect a pattern of action on the opponent. Sources of information obtained from several basic sources, namely information that come from outside (eksteroceptive) and information from inside (proprioceptive), exteroceptor information come from two things, namely sight and hearing. Another source of information was proprioceptive. It was information from body movements, proprio shows information from within the body, such as joint position, muscle strength, orientation in space for example in an inverted state and so on.

The effect of exercise using Jo-Klimah hardware on flexibility

The Jo-Klimah hardware used in flexibility training uses ultrasonic sensors. Ultrasonic sensors were sensors that use ultrasonic waves or sound waves (physical), these waves could not be detected by our senses, both hearing and sight. These waves were at a very high frequency, which was approximately 20,000 Hz to 40,000 Hz (Bhatt & Trivedi, 2018). The ultrasonic wave system worked the same as the working principle of radar, which was to emit waves with a certain frequency and would be received back by the wave receiver if it hit an object. Ultrasound sensors were very versatile in distance measurement. They also provided the cheapest solution. Ultrasonic waves could be used to be channeled in air or in water, ultrasonic sensors propagate quite quickly (Shrivastava *et al.,* 2009). Detection of the existence of the distance was obtained from the speed of the wave with the time used when sending the wave until the time when the reflected wave propagated back by the sensor at a speed of about 340 meters per second.

Figure 2. Jo-Klimah Microcontroller Display

The ultrasonic sensor often used in electronic components was the HC-SR04 Sensor. The sensor was a sensor using 3 PINs with the trigger pin installation and the output was placed separately. The range of the HC-SR04 sensor was between 400 to 500 cm with a maximum emission and detection angle of about 15 degrees, the voltage used on the sensor was a low voltage of 5V DC and could be connected directly to the foot of the microcontroller.

The microcontroller-based Jo-Klimah hardware had advantages, including: making it easier for students to do flexibility exercises according to the given load, the hardware accelerated the detection of flexibility, because Jo-Klimah was equipped with a seven segment monitor that display results in the form of digital numbers that were displayed directly and up to date. , as well as providing more objective and accurate results because Jo-Klimah was more durable/ tireless and able to work consistently, this tool provided more transparent results because the results display monitor could be seen by students, trainers, and observers in a timely manner .

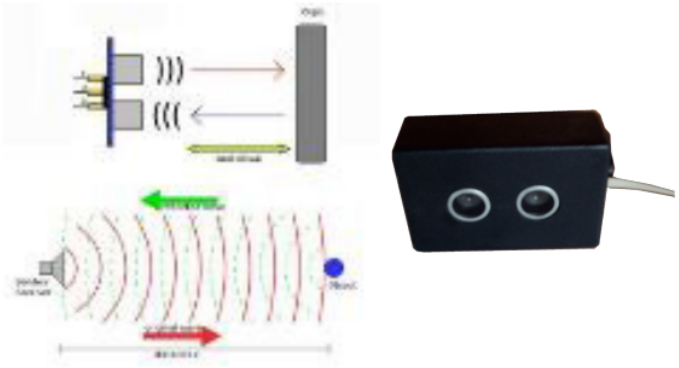

Figure 2. Jo-Klimah Ultrasonic Sensor

Hardware was a physical component that could be touched and arranged into a series of input (input), a series of processes and a series of outputs (output) forming a computer so that the system in the computer could be operated. Each hardware device had a special function and it was mutually integrated between one hardware and another with the same goal of supporting computer performance. Digital Automation Network Hardware for Individual Flexibility of Madrasah Ibtidaiyah (Jo-Klimah) children had a function as a device for detecting the value of body flexibility exercises in children obtained by children who were trained and these values would be displayed directly during the exercise, so that all students, trainers and stakeholders involved could find out directly on the Jo-Klimah monitor board that had been installed. Jo-Klimah hardware was a device that could replace the role of the trainer in determining the flexibility of the human body.

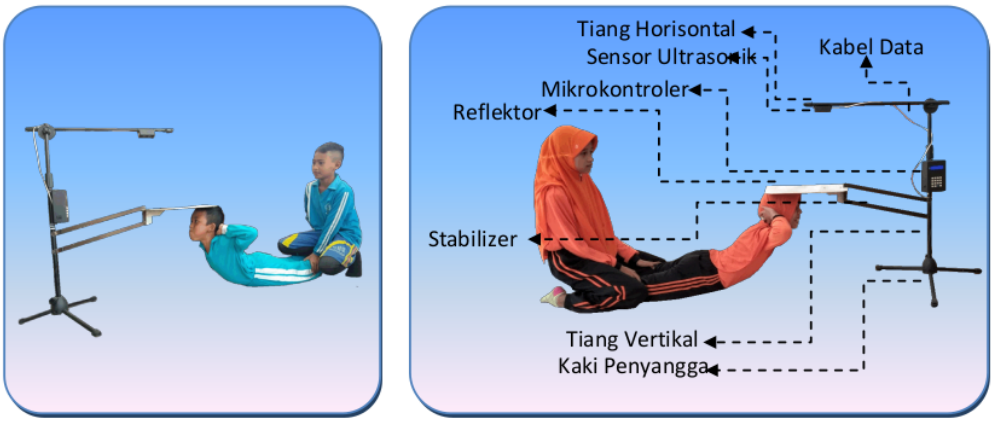

Figure 3. Flexibility Exercises Using Jo-Klimah

Students in doing flexibility exercises using the Jo-Klimah tool were very enthusiastic and motivated because they could directly see the results of flexibility on the display, so students were excited to be encouraged to produce higher or more flexible, in this case our emotions affect flexibility. Motivation was a process in which students' internal energy or needs were directed at various goal objects in their environment, in other words, motivation was a condition that increases the desire to do better (Fatih Kucukibis & Gul, 2019; Zeng *et al.,* 2017). Motivation in physical activity refers to dispositions, social variables, and cognitions that come into play when a person performs a task in which he was evaluated, or enters into competition with others, or attempts to compete to achieve a standard of excellence (Robert, 2014: 49). The advantage in this case was the value of flexibility where everyone would be able to know the results directly, both the results of themselves and the results of other students, so that they competed to get maximum results. Variations in training and the choice of forms of exercise caused sports actors to increase their studies with new methods with the same goal of improving performance (Cahyono *et al.,* 2018; Pratiwi *et al.,* 2018). A more suitable motive was intrinsic motivation for involvement in increasing the level of student flexibility.

Students in doing flexibility exercises using Jo-Klimah hardware caused an appetite for circumstances that cause someone to be personally responsible because

they without being supervised by a trainer will be able to know the exercise program from the tool. In addition, the desire to get clear feedback on the performance made by students can be immediately captured in the memory of the device and displayed on the screen display, so that performance can be immediately known and evaluated both by students personally and by the trainer concerned.

The use of the Jo-Klimah tool physiologically caused the muscles to stretch even more. Stretching could induce elastic changes of the musculotendinous system. The elastic change was defined as the elongation (incorporation of amino acids-amino acids) tissue when the tension had been removed (relaxation), so with the Jo-Klimah device there was a temporary increase in range of motion (ROM) or often called the angle of motion. Plastic changed involve musculotendinous elongation in which the deformation (change in shape) of the tissue remains even after the tension has decreased (Behm, 2018) . So training with the Jo-Klimah apparatus was considered a semi-permanent change in flexibility.

The increase in flexibility caused by muscle contraction at soft tissue temperature could decrease the viscosity of intracellular and extracellular fluids, thereby providing less resistance to movement. The increase in muscle temperature increases due to muscle contractions associated with these dynamic muscle movements. Nerve neuromobilization was also subjected to prolonged stress, so ROM was increased to produce more flexible muscles. The increase in ROM could be attributed to psycho-physiological effects, the increase in flexibility was mostly associated with the increase in stretch tolerance that occurs. Physical exercise was basically a stressor for the body, therefore the recommended exercise was that the body was able to adapt to the stress of the exercise (Wijayanto, 2018). These persistent flexibility adaptations might be partially ascribed to neural and muscular adaptations such as intrinsic disaffiliation of the spindle.

The benefits that would be obtained in the Digital Automation Network Hardware for Individual Flexibility of Madrasah Ibtidaiyah (Jo-Klimah) children were: (1) the results of the exercises carried out on flexibility were made easier because they provided accurate results and were displayed in displays that everyone knew, thereby reducing the impact of cheating. occurs, (2) for the trainer, could minimize the use of paper and data in real time and could be accessed quickly on the microcontroller device, (3) for students, it could reduce motion errors that occur

because they focused on movement and reduce outside influences, and could also minimize cheating because they did exercises with sportsmanship because the tools could not be deceived or manipulated, especially manipulation of movements and data results, (4) for coaches, could immediately get flexibility training data results quickly in a short time with accurate data very high, so the data could not be used to evaluate the student's weakness or the test

The effect of back-up exercises on flexibility

Back-up exercise was an exercise method for the flexibility of the spinal joints and also the strength of the muscles that work on the spine. The back-up exercise was done by first sleeping on your stomach and your feet together while your hands were behind your head and your elbows were close to your chin. The next step was to lift the front of the body up so that the chest did not touch the floor, then returned to the chest against the floor and so on repeatedly.

Flexibility was important in fitness because it allowed for better performance during games or sports, and in daily activities for flexibility such as walking, and lifting to make it easier. Human life was shaped by skillful motor skills (movement/ movement). Without basic movement skills, we could not protect ourselves from environmental hazards, build shelter, provide food, move from one place to another, or work. Motion was the first and foremost need, especially for human life and generally for other living things. Without motion, humans would never exist on earth. Motion had the biggest role in the process of creating human embryos to become fully human (starting from the process of conception, while in the womb, until humans were born and continue to live on earth).

Training was given three times a week with a gap between one and two days, the training schedule was given on Monday, Wednesday and Friday. Selection of the frequency of 3 times per week was based on the adaptation of the given exercise. All cells had the ability to adapt to what happens in the body, this general adaptation took place in the body all the time. The adaptation went through several stages, namely after the stimulation in this case was exercise, the first thing that occurs was fatigue, so that the body condition was below normal, the beginning of the exercise would cause its normal biological state to be disturbed, because after training

students wiould experience fatigue, both physical fatigue as well as mental fatigue in the central nervous system because the concentration of lactic acid in the blood becomes high, under normal circumstances the fatigue would disappear within 24 hours due to passive rest.

The muscle responded that occurs for the first time due to a stimulus / stimulation in doing flexibility exercises was a response, where the response was a direct response of the body during a temporary training process such as an increase in body temperature or an increased heart rate. The progressive increased in exercise sets of flexibility given during exercise means that it put stress on the leg muscle groups. To face / fight these challenged the body needs large muscles, if the body got repeated stress it means there was an increase in the muscles being trained, this had an impact on increasing muscle strength / muscle explosive power. As a result of the muscles being trained, the central and peripheral nervous mechanisms increase (Bartolomei *et al.,* 2018). This was a result of neural adaptations in motor units that were not directly involved in flexibility training.

The increase due to back-up training was not as high as training using Jo-Klimah hardware, this was caused by several factors. The main factor was the monotonous form of exercise so that students feel bored and there was no challenge. By experiencing saturation, students would not get maximum results in obtaining flexibility scores. The boredom or boredom was caused by the form of exercise that had no variation and students feel unable to see the value obtained immediately after doing the exercise. The application of the drill method in basic technical skills training was one effective way to improve ball mastery or basic techniques, but with a note, and what must be considered in the application of this method was to minimize the saturation that sometimes occurs in the process.

Saturation in the field when doing back-up exercises due to drills from the trainer's instructions repeated by students, thus reducing their motivation. The conceptualization of boredom was determined by various situational and individual factors. Boredom itself could be described as a negative state of mind or an inner conflict between expected and perceived experiences. Boredom as a state of lack of stimulation, lack of arousal, and lack of psychological involvement associated with dissatisfaction, in which individuals attempt to overcome boredom by seeking additional stimulation"(Wegmann *et al.,* 2018).

When doing back-up exercises, intrinsic motivation was lower when compared to exercises using Jo-Klimah hardware where students were very enthusiastic and self-motivated. Second, the back-up exercises were very monotonous in terms of the training program. Meanwhile, exercises using the Jo-Klimah hardware setting could be randomized with progressive repetition for each exercise, thus creating a separate challenge for students. Third, with back-up drills, students easily experienced boredom so there was no sense of enthusiasm as a driving force that comes from within the individual, while the various forms and models of training make Jo-Klimah hardware attractive to students. In the end, training using the Jo-Klimah hardware increased students' enthusiasm which resulted in an increase in joint muscle abilities that were more optimal compared to the back-up drill exercise.

CONCLUSION

There was a significant effect between training using the Jo-Klimah hardware on the body flexibility of primary school students, this was due to the level of intrinsic motivation of the Madrasah Ibtidaiyah students' because the tools provided a variety of different training models, so that hormonally it increased the joints, physiologically it caused the muscles to stretch more and increases the range of motion (ROM). Back-up exercises also had a significant effect on the flexibility of the madrasah ibtidaiyah students' bodies, this was because routine back-up exercises could make the joints maintain their flexibility, muscle stiffness and body joints could be prevented by flexibility exercises. There were differences in body flexibility between exercises using Jo-Klimah hardware and back-up exercises for primary school students, but on average they were still below exercises using Jo-Klimah hardware, this was because back-up exercises gave the impression to students' monotonous exercises, so that their intrinsic motivation was not well developed.

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