

Models' Therapy Activation and Relaxation based Culture of *Pencak silat* for Autism

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Abstract—Autism in Yogyakarta has increased 25% in the last 10 years. Current available therapy hasn't become an effective solution in decreasing this number. Indonesia as a multicultural country, doesn't have traditional therapy related to autism. Substantially, *pencak silat* is a part of four unity, *catur tunggal* as it's reflected in IPSI emblem, *trisula*. Where each of the three *trisula*'s edge symbolize arts, self defenses, and sports, and the handle symbolize mental spiritual elements. Culture of *pencak silat* based relaxation and activation therapy for autism has a characteristic which has been modified to the autism's condition. Balance system in the form of psychoneuroimmunology is a concept multivariable complementation that reflects in behavior, nervous system, hormones, and immune system. Purpose of this research are 1) to analyze activation therapy methods, and *pencak silat* culture-based relaxation and activation therapy models for autism, 2) to design *pencak silat* culture-based relaxation and activation therapy models for autism, 3) to develop *pencak silat* culture-based relaxation and activation therapy models for autism. Benefit of this research are improvement in quality of autism's life, could be used as literature in making a policy in education of school for autism, this research can be used as literature in another research. In this research, used a research and development method (RnD). Therapy effective for autism is *pencak silat* culture-based relaxation and activation, it is concept balance system in the form of psychoneuroimmunology.

Keywords—*autism, pencak silat, psychoneuroimmunology, therapy.*

I. INTRODUCTION

Sutadi in [1] defined autistic as severe neurobiology developmental disorder that affects someone in the way they communicate and make a relation with others. Someone with autism are unable to make a meaningful relationship, because his ability to make such relationship is disturbed that they unable to communicate and to understand other's feeling. Veague in [2] said, autism is a heterogeneous disorder, that they could see and react differently than others.

The same thing also said by Yuwono in [3] stated that autism is a very complex or severe neurobiology developmental disorder in a lifetime that includes disorder in social interaction, communication, language, behavior, emotions, sensory perception to motoric aspect. Hadis in [4] children with autism can also be classified as children with pervasive developmental disorder. Disorder group can be identified with the presence of abnormalities qualitatively in social interaction, communication pattern followed by interest, limited movement, stereotypic, and repeatedly.

Pervasive is a wide and severe disorder that affects individual function deeply and widely in every aspect

The autism must be diagnosed up to the age of 18 months. Early intervention is very important for better outcome. Projection of people with autism in Yogyakarta increased 3-4% each year and increased in the last decade was 25%.

Observation that has been done found out about some condition that might happen to people with autism. It's described in this Table I below.

TABLE I

No	Autism's condition	Aspect
1	<ul style="list-style-type: none"> • Poor sleep quality • Exhausted • Anxiety • Muscle spasm 	Psychological
2	Hyperactive People with autism have hyperactive characteristics, they tend to have repetitive active movement. Such as jumping on a trampoline continuously.	Behavior
3	Hypoactive People with autism have hypoactive characteristic, they tend to move less or passive. This kind of characteristic make them often just sit still, or just lay on their back. Sometimes with empty gaze or just observing their friend's activities.	
4	Children with autism have limited interest and bund to the same routines, like playing something repeatedly.	
5	Difficult in reading and understanding mind and feeling of others, they also difficult to understand their ability to influence and change surroundings. In the end, they seem to lose interest in making social interaction.	Social interaction
6	Children with autism have different communication ability, they hard to understand the social function of verbal communication. That's why they have expressive ability but lack of receptive ability. In some children also found language developmental delay.	Communication disorder

Limitation in the current therapies is that the current therapies only focus in one improvement, while each child with autism has their own different characteristics, some

children hyperactive, and the others have hypoactive characteristic

So far, author observed that nowadays needs a therapy that combine each characteristic that needed by those children. *Pencak silat* is one of Indonesian's culture. Substantially, *pencak silat* is one of four face, *catur tunggal* that reflected in trident in IPSI emblem, where each end symbolizes art, self-defense, and sport, and the handle symbolize mental spiritual.

The rest of this paper is organized as follow: Section II presents the theoretical background. Section III describes proposed research method. Section IV presents the obtained results and following by discussion in section V. Finally, Section VI concludes this work.

II. THEORETICAL BACKGROUND

Pencak silat related relaxation therapy and activation given to children with autism that lack of something. Balance system consist of Psycho neuro immunological balance. Psycho neuro immunological balance reflects complementation of multi-variable between behavior nervous system, hormonal, and immunological [5]

Pencak silat based on Maryono in [6] is attack and defense movement in dance and rhythmic in rules of certain customary courtesy, that usually shown in public. Silat is essence of pencak, knowledge to fight or self-defense to death that can't be shown in public.

Pencak silat based on Muhajir in [7] contains element of meaning as essence of *pencak silat* its selves. It contains four elements of *pencak silat*, sport, art, self-defense, and religion. So, we can conclude that *pencak silat* is Indonesian self-defense form of art in attack and defense movement in form of dance and rhythmic in rules of certain customary courtesy. Inside contains four elements of *pencak silat*, sport, art, self-defense, and religion.

Pencak silat is part art that in certain areas there is a typical percussion musical accompaniment. It is supported by Maryono [6] as the arts, martial arts are a manifestation of the culture in the form of rules of motion and rhythm, which are subject to the alignment, balance, and harmony between *wiraga*, *wirama*, and *wirasa*. Martial arts as shown, to strengthen the human instinct to defend themselves from various threats. To achieve this goal the techniques and tactics used by fighters prioritize effectiveness in ensuring physical security, if necessary, by giving precedence to his opponent's attacks [6].

Martial arts as a sport prioritize physical activity, in order to gain fitness, agility, and performance in sports. Physical exercise or sports in martial arts is done right and will give programmatic changes to the system of the body, be it a metabolic system, nervous system, muscles and hormonal. This is supported by Suharjana in [8].

Pencak silat more focused on the formation of attitudes and personality characteristics in accordance with the philosophy of noble character [6]. Martial arts teach self recognition as individuals who believe in a higher power is God Almighty. Therefore, it is no less important in martial arts in addition to the regularity of exercise, is to appreciate and practice the various demands of customs values and norms that contain decency as pugilistic public ethics [6].

The fourth function is the function of education, the function of physical education, health function, and the function of sport. Viewed from the goal, the sport has 5 five objectives. According to KDI-Sport (2002: 10-11) can be classified into the sport education, sport health, recreational sports and competitive sports rehabilitative exercise which will be described as follows. (1) sports education is a process of development that emphasizes mastery of skill and agility exercise. Values education through experience complete debriefing so that there is a process of socialization through and into the sport. (2) sports health, types of sports activities to achieve health and fitness objectives covered by the concept of well-being through sports activities. (3) a recreational sport is the kind of sport that emphasizes the achievement of objectives that are re- who are recreational or benefit from physical aspects and socio-psychological. (4) competitive sports are a type of exercise that focuses on performance and achievements show the maximum, which is typically managed by a formal sports organization, both nationally and internationally. (5) rehabilitative exercise is a type of exercise that emphasizes the objective nature of therapy or psychological and behavioral aspects.

In its development, the much-needed exercise rehabilitative. Rehabilitative exercise has a purpose that is therapeutic or psychological and behavioral aspects. Within the limitations conducted by researchers is the therapy for children with special needs and more specific therapies for people with autism. Genetic factors might contribute to pathogenesis should ultimately lead to important opportunities for discovering therapeutic targets that can be used to treat autism [9].

According Sutadi in [1] with autism are children who have severe developmental disorders, among others affects the way a person to communicate and relate to others. Zimmerman in [10] stated that autism is a biological disorder. Autism is a complex developmental disorder that involves communication of social interaction, impaired sensory, play patterns, behaviors, and emotions.

Sutadi in [1] explain that what is meant is autistic is a neuro developmental disorder that affects the way a heavy biological one to communicate and relate (relating to others). According Veague in [2] Autism is a heterogeneous disorder, which is that people with autism in view of a case and act very differently to others.

According to Levy in [11] stated that Autism is a neurodevelopmental disorder in the category of pervasive developmental disorder and is characterized by severe and pervasive impairment in communication and repetitive or unusual behavior. According to Levy autism is a neurodevelopmental disorder by category pervasive developmental disorders, and children with autism have a hard characteristic and have difficulties in communication and repetition habit.

From some of the above it can be concluded that persons with autism is a pervasive developmental disorder (Pervasive Development Disorder) in the form of interruption communication, social interaction, impaired sensory, play patterns, behaviors, emotions, interests, movement restricted, stereotyped, repetitive, and

developmental disorders neurobiological according to Hadis in [4] there are several theories that explain the factors that influence the occurrence of autism: (1) Biological Theory; (2) Prenatal, natal and post-natal; (3) Neuro Anatomy.

Impaired function in brain cells during gestation that may be due to the disruption of oxygenation bleeding or infection can trigger autism. In addition, neuropathology conditions could be expected to encourage the emergence of behavioral disorders in children with autism and some areas in the brain. The increase levels of serotonin in the blood makes the neurotransmitter dysfunction. Heavy neurobiological development that affects the way a person to communicate and relate (relating to others) [4].

Parietal lobe abnormalities on according to the Handojo in [12] states on the autism disorder occurs due to disturbances in the brain, the anatomical abnormalities in the parietal lobe, cerebellum, and limbic system. The situation is causing a few things: (1) Abnormalities in the parietal lobe causes the child is not concerned with the environment; (2) Disorders in Small brain (cerebellum), especially on the lobes VI and VII cause sensory processes, memory, thinking, language learning and the attention (attention) is disturbed; (3) The number of cells in the cerebellum Purkinje very little causing serotonin and dopamine balance disorders, which cause disruption or chaos passing in the brain. Purkinje cells rich in the neurotransmitter serotonin, which serves to send messages from the cerebellum to the cerebral cortex area. Because cell Purkinje slightly, causing communication between the cerebrum and cerebral cortex is disconnected, resulting in cognitive deficits. The area of the limbic system called the hippocampus and amygdala were also found typical abnormalities that cause malfunctioning of control of aggression and emotion. This resulted in children is difficult to control his emotions (aggressive or very passive). 4) The amygdala is also responsible for a variety of sensory stimuli such as hearing, sight, smell, taste and fear (emotional response). 5) The hippocampus is responsible for learning and memory function so the difficulty in storing new information, repetitive behavior strange and hyperactive.

A. Psychosocial

Autism is considered as a result of a cold or not the relationship between mother and child is familiar. as well as those who have an emotional nurturing stiff. Obsessive who does not warm even the cold can lead his team into autism [4].

B. Immunology

immunology theory states that with the discovery of a decrease in the response of the immune system in some children with autism increases the likelihood of immunological basis in some cases of autism. The discovery of some maternal antibodies against leukocyte antigens their children with autism reinforce this notion because it turns leukocyte antigen is also found in the brain cells that maternal antibody can directly damage the fetal brain nerve tissue, causing autism. The viral infection is caused by congenital rubella, herpes simplex encephalitis, and cytomegalovirus.

From the explanation of some experts on autism can be concluded that there is no exact cause of the cause of autism, but from a variety of research can be diagnosed from a variety of symptoms caused by contained in children with autism with some theories supporting the cause of autism is a biological theory, psychosocial theory of immunology, the theory of genetic and neurobiological theories.

According to Wing and Gould in [13] classify autistic children into three groups, namely group aloof, passive group, and the group is active but odd. Described in the description below: a. Aloof group This group is characteristic of a classic and can be known by many people, and this is in accordance with the description of infantile autism classic [14]. This type of autistic children is very close to the environment b. Passive group

Children of this type do not interact spontaneously, but do not reject the business interaction from the other party, even sometimes show a sense of fun. This type of group of autistic children can be invited to play together but remain passive c. Active groups but Strange In this group of children with autism can approach others, try to say or ask but not for pleasure or for the purpose of reciprocal social interaction. The child's ability to approach others sometimes physical shape, very attached to others, even if the other person does not like it. Speaking ability is better if compared with other groups but remains characterized by slowness of speech. From these explanations can be simplified classification of autism is into two groups of active and passive this is based on the characteristics of persons with autism

III. PROPOSED METHOD

Population in this study is autistic in Yogyakarta with the sample are some people with autism at Autism Special Educational Development Anggita and the Special School N 1 Bantul. The sample used has different characteristics, the characteristics of the second one is passive is active characteristics. Test validation of this model is carried out by several experts in the field of medicine, martial arts expert and expert science educator with autism.

Activation and relaxation therapy based martial arts culture for people with autism. Therapeutic use a variety of equipment including the use of rubber balls, mats display. Activation and relaxation therapy model were developed based on the martial arts culture. This is because of the lack of a model of therapy that has the characteristics of Indonesian people, in addition to the various characters in the martial arts for therapy in accordance with autism.

Model of therapy given to people with autism that are tailored to the characteristics of each. Persons with autism who have given a passive characteristic activation therapy, namely in the form of a squeeze ball to squeeze the number increased each cycle. Persons with autism were active then passive therapy that has the distinction of therapy in motion with the hold time is always increased every cycle. With the model of activation and relaxation therapies given in accordance with the characteristics of people with autism the balance point or hope happens is that people with autism

balanced with passive characteristic will become more active, whereas active autistic more relaxed

IV. RESULTS

The results of the development model of activation and relaxation therapy based martial arts culture for people with autism are produced a model of therapy that consists of heating, and cooling the core.

Movement to start therapy is greeting consists of four movements. I regards movement is a perfect standing position (standing with feet together, arms beside the body, eyes looking forward). Salam II raised both arms to the sides at shoulder level hold three seconds. Salam III raised both arms above his head, clasped hands (take a breath. Regards IV lowered his arms, clasped his hands in front of chest (exhale).

Heating aims to prepare physically and psychologically in addition to avoid being injured. Circulation as well as the optimization of temperature is also achieved through heating. heating good body should reach a temperature of 38° while heart rate reached 50-60% of maximum heart rate. Older heating is carried out between 5-10 minutes. the movement starts with a light intensity then increasingly severe and of simple movement to the complex. The heating in the form of the movement mimics the movement of trees so-called tree. the first movement is, trees bend to the right. the second movement is a tree bend to the left, the third movement is a tree bend backward, the fourth movement of trees bend forward and move fifth winding down. the distinguishing characteristic of autism group active and passive is contained in a squeeze ball movement to grub passive, whereas for active grub is to restrain the movement with enhanced intensity between one and the next meeting. Core movement, developing of movements in martial arts. The first point is the movement of the horses Eagles ahead. Easel leg muscle strength training. Eagle consists of forward movement eagle wings, eagle wings upward, eagle wings 90°, 180° eagle wings eagle wings straight right. The second core of the movement develops dragon. Horses with foot and toe. This is to train leg muscle strength whereas, in addition to training arm strength. Movement dragon dragon consists of movements right, left dragon, dragon tiptoe, dragon dragon lift your right leg and lift the left leg.

The third core adalalah develop from the movement of tigers, tiger movement using the horses and also to train the arms and hands. Tiger tiger movement consists of the right, left tiger, tiger stalking a tiger lurking right and left.

The fourth is to develop the core of the movement of the eagle. Movement eagle leg muscle strength training, muscular arms. Garuda eagle movement consists of the right, left eagle, eagle wings open, open eagle wings lift the right foot, blisters eagle wing eagle lift the left leg and wing lid. The fifth is to develop a core of basic movements in martial arts that single moment. Developed a series of motion of the ball. Ball one, ball two, three and four-ball ball. The fifth core movement is a movement Memorization Movement (MG2). This movement memorize any movement on the mat that has been given media motion picture that should be emulated by the intensity of squeezing the ball in accordance with the number and duration

withstand movement during the existing numbers on the mat.

Movement of the cooling in the form of movement with the aim to lower body temperature. In the cooling does not squeeze the ball, simply hold motions. Development carried out consisting of the first movement is the heron opened wings 1, the heron opened wings 2, and the heron close the wing.

V. DISCUSSION

Activation and relaxation therapy martial arts-based culture development model based on the knowledge of psychoneuroimmunology is the science of psychology, nervous, and immune. Initial movement in the form of greeting with breathing. According Siswantoyo in [5] revealed that the breathing exercise can improve physical fitness and boost immunity. Breathing exercise aimed to develop mitigation efforts stressor well to maintain and restore homeostasis. Spending ACTH and cortisol hormones that existed at certain levels stimulate the immune system to produce immunoglobulins which play a role in the body's defenses [5].

Psychological disorders in people with autism due to disturbance developments in the limbic system which has an important role in regulating human emotion. The limbic system is experiencing dysfunction causing disturbances in emotional processes. In this therapy using the accompaniment of music it is supported by the opinion of Tomatis in [16] that the foundation of therapy theory in a creative and healing power by sound and music. Improved overview of music therapy in vestibular or the ability to balance and regulate internal muscles. Which is accompanied by music therapy is one of the rehabilitation programs for the development of skills performed on a person as a musical force in building autism is supported by the opinion Rose in [15] music gives many positive sides. Music therapy is used as the person who suffered brain damage, developmental disorders, especially disorders of the ASD. Music have an impact on brain plasticity, cognition, emotion and health.

According to Chamidah, *et al.* in [17] there are some neuro-related dysfunction in autism, is a) macrocephaly discovered at the age of 2-3 years at 20 children with autism disorders, b) the rapid brain development at age 12 months, c) progress on the substance of the brain's white great and the pattern of development abnormal of the frontal lobe, temporal, and system limbic such as the amygdala (associated with the development of communication and motor) d) abnormalities in cell structure Purkinje, e) functional MRI difference in activation of neurons, f) disorders neurotransmitters (serotonin, dopamine, choline, glutamine).

Sport associated with the immune system and is influenced by the functioning of glutamine by glutamine metabolism which serves as a link. Increased production of glutamine will be followed by an increase in the proliferation of lymphocytes including T and B lymphocytes B lymphocytes will then secrete IgA. Sports with heavy and prolonged intensity will decrease the concentration of

glutamine which will result in decreased secretion of IgA. In addition, a decrease secretion of IgA can be caused by the secretion of the hormone cortisol and oxidative stress occurs [18].

Similar opinion is done in a sustainable exercise the right dosage to lower the secretion of HPA Axis, hypercortisol low, proinflammatory cytokines IL-6 active, stimulates the secretion of growth hormone (GH), prolactin and can improve the body's immune stimulated Th2 cells to maintain homeostasis.

Changes Due Beta-endorphin Levels Breathing Sports. Exercise done in a sustainable manner with proper dosage to lower the secretion of HPA Axis, hypercortisolism low, cytokine, stimulates the growth hormone (GH), prolactin, and can boost the immune system. It is also supported by the opinion Siswantoyo in [5] an increase in hormonal secretion due to physical exercise (physical exercise) pretty much, the most prominent is catecholamine, cortisol, growth hormone and β endorphin.

To be a therapy program can be run in accordance with the purpose, the therapy must be programmed in accordance with the rules. The rules are made is based on the rules of proper training is FITT (Frequency, Intensity, Time and Type). FITT be described below according to Suharjana in [8], namely: (1) The frequency is (frequency) frequency is demonstrated in the number of workouts per week; (2) Intensity (Intensity)

VI. CONCLUSION

This paper has presented therapy activation models and relaxation-based culture of *pencak silat* for autism. It is concluded that, the intensity of the workout is heavy or light load or physical and psychological pressure that must be resolved during exercise. Intensity is measured according to the type of exercise. For relaxation therapy pulse rate can be used to measure the intensity of the workout; (3) The exercise duration (Time) The duration and intensity of exercise are related. Length can mean time, distance, or calories. Show a long duration of time spent on the exercise; (4) Type of exercise is a form for sport models are used for training. An exercise will be successful if the exercise is chosen for the appropriate type. Type of exercise selected to suit the purpose of the exercise, the availability of tools and facilities, as well as individual differences trainees.

REFERENCES

- [1] Sutadi, R. (2002). *Autisme & Appied Behavior Analysis (ABA) atau Metode Lovaas, Klinik Intervensi Dini Autisme*. Jakarta: Medical Center.
- [2] Veague, H.B. (2007). Schizophrenia. New York: Chelsea House Psychological Disorder: *Schizophrenia*, 1, 75-85.
- [3] Yuwono, J. (2009). *Memahami Anak Autistik Dampak Kehadiran Anak Autistik dalam Keluarga*.
- [4] Hadis, A. (2006). *Pendidikan Anak Berkebutuhan Khusus Autistik*. Bandung: Alfabeta
- [5] Siswantoyo. (2010). Perubahan Kadar Beta Endorphin Akibat Latihan Olahraga Pernafasan (Sebuah Kajian Psikoneuroimunologi Pada Aktivitas Fisik). *Jurnal Fakultas Ilmu Keolahragaan UNY*.
- [6] Maryono, O. (2008). *Pencak silat Merentang Waktu*. Yogyakarta: Benang Merah.
- [7] Muhajir. (2008). *Pendidikan Jasmani Teori dan Praktik*. Jakarta: Erlangga.
- [8] Suharjana. (2013). *Kebugaran Jasmani*. Yogyakarta: Jogja Global Media.
- [9] Ramos et al. (2012). *Immune Function Genes CD99L2, JARID2 and TPO*. Show Association with Autism Spectrum Disorder. USA
- [10] Zimmerman, B.J. (2008). Interesting self-regulation and motivation: historical background, methodological development, and future prospect. *American Educational Research Journal*, 45 (1).
- [11] Levy, S.E., David, S.M., & Robert, T.S. (2009). Autism. *National Institute of Health*, 374, 1627-1638.
- [12] Handojo. (2008). *Autisma*. Jakarta: PT Bhuana Ilmu Populer.
- [13] Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*, 9(1), 11-29.
- [14] Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous child*, 2(3), 217-250.
- [15] Rose, F. C. (2010). *Neurology of music*. World Scientific.
- [16] Tomatis, A. (1991). *The conscious ear: My life of transformation through listening*. Station Hill Pr.
- [17] Chamidah, A.N., Purwandari., & Aini Mahabbati. (2015). Pengembangan Panduan Layanan Kesehatan Mental Berbasis Sekolah Bagi Anak Berkebutuhan Khusus. *Jurnal Penelitian Ilmu Pendidikan*, 8(2).
- [18] Pangemanan, D. H., Engka, J. N., & Sapulete, I. M. (2012). Pengaruh pajanan bising terhadap pendengaran dan tekanan darah pada pekerja game center di kota Manado. *Jurnal Biomedik*, 4(3).