



The Effectiveness of Zhu Scalp Acupuncture and Body Acupuncture Therapy Methods on Increasing Intellectual Quotients and Emotional Quotients in Pre-School Children

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Abstract

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BACKGROUND: Intellectual quotients (IQ) is the ability to act purposefully, think rationally, and deal effectively with the environment. Emotional quotients (EQ) include empathy, expressing and understanding, feeling, controlling anger, independence, adaptability, liking, interpersonal problem-solving ability, perseverance, solidarity, friendliness, and respect; important for a person's success.

AIM: This study was to determine the effectiveness of acupuncture therapy with Zhu Scalp acupuncture and body acupuncture methods on the IQ and EQ in Kindergarten Kanisius Mayang Gatak Sukoharjo.

METHODS: The research method is a quantitative pre and post-test design without a control group design. Analysis data to determine of difference with a paired t-test. The research sample was pre-school children in Sukoharjo district with a total of 54 respondents. The data collection instrument is a questionnaire for respondent characteristics, IQ test, and EQ measurement using Vineland Social Maturity Scale.

RESULTS: The results showed that there was a significant difference in the IQ and EQ levels of children before and after acupuncture therapy using the Zhu Scalp method and body acupuncture with a $p = 0.000$. The results of the N Gain test showed that there are differences in the effectiveness of the Zhu Scalp acupuncture and the body acupuncture method on increasing IQ and EQ in pre-school children.

CONCLUSION: The Zhu Scalp acupuncture method is more effective than the body acupuncture method to increase IQ and EQ of pre-school age children in Kindergarten Kanisius Mayang Gatak Sukoharjo.

Introduction

Children are the next generation of the nation and the future of a nation. The current state of health and quality of life of children will determine the future of the nation in the future. Childhood is a period that really determines the optimal growth and development of children. Early detection and stimulation need to be given during this period so that if deviations occur, they can be immediately identified and addressed so as not to interfere with the child's growth and development. Until now, intellectual intelligence has been a measure of children's success in the future [1]. UNICEF 2013 data states that the incidence of growth and development disorders in children under five is 1,375,000 children or 27%/5 million children experiencing motor development disorders. In addition, there are intelligence disorders or mental retardation in 34 children/1700 children. This is triggered by the lack of stimulation and early detection given to support the growth and development of children.

A person's intelligence is shaped and influenced by environmental factors, including family and school.

Intelligence is intelligence that concerns the ability to learn and use what has been learned in an effort to adapt to unfamiliar situations or to solve problems. The level of intelligence of a child is determined methodically by intelligence quotient (IQ) and plays an important role in the success of children in learning. IQ is still a benchmark for children's success in the future. IQ is intelligence that demands the empowerment of the brain, heart, body, and activation of humans to interact functionally with others. IQ only affects 20% of success while 80% is influenced by emotional intelligence and spiritual emotional intelligence. Intellectual intelligence (IQ) can influence ethical behavior, while emotional intelligence and spiritual intelligence do not affect ethical behavior [2]. Intellectual intelligence and emotional intelligence interact dynamically, both at the conceptual level and in the real world.

Acupuncture is a non-pharmacological treatment method based on complementary medicine and has been known in the ordinary health care system for its very wide use and application in everyday life [3]. One way to stimulate children's growth and development or improve children's intelligence is through acupuncture therapy. Several acupuncture

therapy methods that can be used to stimulate children's intelligence are the Zhu Scalp method, body acupuncture, Yamamoto New Scalp Acupuncture (YNSA), and hypnotherapy [4].

The Zhu Scalp method of acupuncture is a method of inserting acupuncture needles at certain specific points (8 areas) on the head and subcutaneously inserting it into the sub-aponeurotic layer of the scalp with manipulations including the Chou Qi sedation method and Jin Qi method of tonification. Body acupuncture method as acupuncture therapy by inserting small and fine needles at certain points on the body which can relieve pain and various other health benefits [5], [6]. YNSA is the development of Japanese Acupuncture scalp science and is known to be very good for stimulating children's intelligence [7]. Hypnosis is a method of thought therapy and healing using hypnosis principles to give positive suggestions or commands to the subconscious mind for healing a psychological disorder or changing thoughts, feelings, and behavior for the better [8].

The effectiveness of the YNSA method and hypnotherapy was carried out by a research team in early 2020 and showed the YNSA method and hypnotherapy were able to increase IQ and EQ in preschool children. Meanwhile, research related to the effectiveness of acupuncture therapy using the Zhu Scalp method and body acupuncture on IQ and EQ in pre-school children has not been carried out. Therefore, the purpose of this study was to determine the effectiveness of acupuncture therapy using the Zhu Scalp method and body acupuncture on increasing IQ and EQ in pre-school children in Sukoharjo.

Materials and Methods

The population in this study was pre-school children in Sukoharjo Regency. The sample used is a total sample of 54 pre-school-age children who attend Kindergarten Kanisius Mayang Gatak Sukoharjo. The research time is from March to November 2021.

Participating acupuncturists

Acupuncture Therapists who have completed the Applied Acupuncture and Herbal Medicine Undergraduate Study Program, have STR Acupuncture, and have a Practice License (SIPAT: Acupuncture Therapist Permit) who work at the Prima Hati Acupuncture Independent Practice Surakarta. There are 4 Acupuncture Therapists with 3–4 years of work experience in the field of Health Acupuncture at various ages and Aesthetic Acupuncture.

The description of ethical approval of this research with letter number No. LB.02.02/1.1/9782.5/2021 have been approved by the Health Research Ethics Committee Poltekkes Kemenkes Surakarta Indonesia. The research method is a quantitative pre and post-test design without a control group design. Analysis data to determine of difference with a paired t-test. The research sample was pre-school children in Sukoharjo district with a total of 54 respondents. The data collection instrument is a questionnaire for respondent characteristics, IQ test, and EQ measurement using Vineland Social Maturity Scale (VSMS).

The independent variables are the Zhu scalp and body acupuncture methods. The dependent variable is the level of IQ and EQ in pre-school children in Sukoharjo. The inclusion criteria were:

- Pre-schoolers 3–5 years old
- Children and cooperative families are willing to be respondents
- Children with parents willing to intervene regularly
- Children and families are able to read, write and communicate verbally and non-verbally
- Children in good health can be oriented to place, time, and people.

The exclusion criteria were:

- Children and families who are not willing to be respondents
- There are contraindications to acupuncture in children.

The treatment intervention in this study is as shown in Table 1.

Table 1: The treatment intervention of Zhu scalp method and body acupuncture

S. No.	Subject	Location	Numbr of needles	Depth of puncture	Response	Needle stimulation	Retention time	Needle type	Number of sessions	Frequency
1.	Zhu scalp method: P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27	Head area is Eding zone (1 cun wide from Shenting (DU 24) to Baihui (DU 20), 0.5 cun to the left, right, anterior and posterior parallel to the tip of the nose	4 pcs	10 mm	deqi	Manual/without needle	30 min	Dongbang Diameter 0.2×15 mm	12×	2×1 week
2.	Body acupuncture method: K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21, K22, K23, K24, K25, K26, K27	GV.20 point Ex point. HN1 GV.17 point GB.13 Titik point PC point. 6 Point.ST.36	6 pcs	12 mm	deqi	Manual/without needle	30 min	Dongbang Diameter 0.2×15mm	12×	2×1 week

The research instrument used a questionnaire to determine the respondent's characteristics and an IQ measurement instrument with an IQ test; VSMS instrument to determine EQ. Measurement of IQ and EQ data was carried out pre and post-treatment intervention. Measurement of IQ and EQ tests is carried out by Psychologists from the Pranatama Applied Psychology Institute with the address. Jl. Cacak II/46 Sambeng Mangkubumen Surakarta. Psychologist Qualification: S1 Psychology graduate, practicing psychologist 4–5 years.

The instrument used is a psychological evaluation instrument. IQ test using an Evaluation Instrument to measure aspects of intellectual intelligence developed by the Institute of Applied Psychologists Pranatama Surakarta, including Intelligence Level/IQ score classification, aspects of intellectual intelligence consisting of understanding, memory, logic, creativity, communication, reasoning numbers, general knowledge. However, in this study, not all of these aspects were analyzed. The selected aspects are understanding, memory, logic, creativity, and general knowledge.

EQ test with the VSMS instrument, namely the social maturity scale from Vineland, namely the VSMS. This measuring instrument can measure the social maturity of individuals aged 0 months–25 years and over. This measuring instrument consists of 8 indicators. In this study, the nine indicators by the Institute of Applied Psychology Pranatama Surakarta were described into nine aspects of emotional development including self-esteem, self-regulation, self-defense, social interaction, self-awareness, independence, competence, sensitivity, and dominance.

Data analysis techniques include univariate and bivariate analysis. Data were analyzed using SPSS 22. The method of analysis used the Mann-Whitney test and the paired t-test.

Results

The characteristics of respondents by gender as listed in Table 2.

The distribution of respondents as Table 2 shows that the largest number of respondents were 22 women (40.74%) and 32 men (59.26%). Measurement of children's IQ and EQ before and after acupuncture therapy with the Zhu Scalp method, body acupuncture method used the t-test as listed in Table 3.

Table 2: Distribution of respondents (n=54)

S. No.	Gender	n	%
1	Female	22	40.74
2	Male	32	59.26
Total		54	100

Based on Table 3 shows the results of measuring children's IQ levels from every aspect of understanding, memory, logic, creativity, and knowledge before and after acupuncture therapy using the Zhu Scalp method. There is a significant difference, namely, $p\text{-value } 0.000 < 0.05$. In results of measuring IQ levels from all aspects before and after acupuncture therapy using the Zhu Scalp method showed that there was a significant difference in $p < 0.05$.

The results of measuring the IQ level of children from every aspect of understanding and logic, before and after acupuncture therapy with the body acupuncture method there was a significant difference $p < 0.05$. Meanwhile, the result of measuring the child's IQ level from the memory aspect, $p = 0.460$; from the aspect of creativity, the $p = 0.424$ and from the aspect of knowledge, the $p = 0.235$, so there is no significant difference.

The results of measuring children's EQ levels from aspects of self-regulation, independence, competence, and sensitivity; before and after acupuncture therapy with the Zhu Scalp method there was a significant difference $p < 0.05$. In the results of measuring the level of children's EQ from the aspect of social interaction, there is no significant difference $p = 0.113$. From the results of measuring the level of EQ in all aspects before and after acupuncture therapy using the Zhu Scalp method, there was a significant difference with a $p < 0.05$.

The results of measuring children's EQ levels from the aspect of self-arrangement $p = 0.291$ and from the aspect of social interaction $p = 0.575$ so there is no significant difference. Meanwhile, the results of measuring children's EQ levels from the aspects of independence, competence, and sensitivity showed $p < 0.05$ so there was a significant difference. From the results of measuring the level of EQ in all aspects before and after acupuncture therapy with the body acupuncture method, there was a significant difference, $p < 0.05$.

The percent N-Gain test is used to determine the effectiveness of acupuncture therapy on increasing IQ and EQ using the Zhu Scalp method and the body acupuncture method. The N-Gain test was performed using the normalized Gain technique. Hake, Richard R., 1999. Based on Table 1 shows there is a significant difference in effectiveness between the Zhu Scalp method and the body acupuncture method on increasing IQ and EQ with a $p < 0.05$.

Based on Table 4, the N-Gain-Percent of the IQ measurement of the body acupuncture method is 24.0741% and the average N-Gain-Percent of the Zhu Scalp acupuncture method is 46.4198%, so it can be seen that $24.0741\% < 46.4198\%$. While the N-Gain-Percent of the EQ measurement of the body acupuncture method is 20.1459% and the average N-Gain-Percent of the Zhu Scalp acupuncture method is 31.2220%, so it can be seen that $20.1459\% < 31.2220\%$.

Table 3: Measurement of children's IQ and EQ before and after acupuncture therapy with the Zhu Scalp and body acupuncture method

Group	Aspect	Mean difference	Std. error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Zhu Scalp	Understanding	-12.40741	1.28506	0.000	-14.9860	-9.82876
	Memories	-10.74074	1.38294	0.000	-13.5158	-7.96567
	Logic	-10.92593	1.23374	0.000	-13.4016	-8.45025
	Creativity	-11.14815	1.39748	0.000	-13.9523	-8.34391
	Knowlegde	-12.96296	1.32448	0.000	-15.6207	-10.30520
Body acupunture	IQ	-11.69088	0.86278	0.000	-13.4230	-9.95877
	Understanding	-7.03704	1.49301	0.000	-10.0329	-4.04109
	Memories	1.11111	1.49301	0.460*	-1.88483	4.10706
	Logic	-9.25926	1.40000	0.000	-12.0685	-6.44995
	Creativity	-1.11111	1.37816	0.424*	-3.87660	1.65438
Zhu Scalp	Knowlegde	-1.66667	1.38675	0.235*	-4.44939	1.11605
	IQ	-3.59259	0.78956	0.000	-5.17696	-2.00823
	Self-arrangement	-10.74074	1.82675	0.000	-14.4063	-7.07509
	Social interactions	-3.33333	2.18391	0.133*	-7.71566	1.04899
	Independence	-10.92593	1.23374	0.000	-13.4016	-8.45025
Body acupunture	Competence	-6.29630	1.82892	0.001	-9.96629	-2.62630
	Sensitivity	-15.18519	2.32887	0.000	-19.8584	-10.51196
	EQ	-9.33333	0.85679	0.000	-11.0526	-7.61405
	Self-arrangement	-2.03704	1.91143	0.291*	-5.87261	1.79854
	Social interactions	-0.92593	1.64115	0.575*	-4.21913	2.36728
N-Gain-Persen on increasing	Independence	-9.25926	1.68164	0.000	-12.6337	-5.88481
	Competence	-7.03704	1.47076	0.000	-9.98833	-4.08574
	Sensitivity	-10.00000	1.74325	0.000	-13.4981	-6.50190
	EQ	-5.85185	0.73106	0.000	-7.31884	-4.38487
	IQ	-22.34568	6.35802	0.001	-35.10399	-9.58737
	EQ	-11.07609	3.19842	0.001	-17.49419	-4.65799

*The mean difference is significant at the 0.05 level, IQ: Intelligence quotient, EQ: Emotional quotient.

Table 4: The results of the N-Gain test using the Zhu Scalp method and the body acupuncture method on increasing IQ and EQ

Method	Component	N Gain %	p-value
Zhu Scalp	IQ	46.4198	0.000
	EQ	31.2220	0.000
Body Acupuncture	IQ	24.0741	0.000
	EQ	20.1459	0.000

IQ: Intelligence quotient, EQ: Emotional quotient.

The results of the test of the effectiveness of acupuncture therapy using the Zhu Scalp method and the body acupuncture method on increasing IQ and EQ showed the $p < 0.05$, there is a significant difference in effectiveness between the Zhu Scalp method and the body acupuncture method on increasing IQ and EQ. Based on this, the Zhu Scalp method is more effective than the body acupuncture method.

Discussion

The differences of respondents based on Table 1 between men and women in physiological anatomy have implications in terms of the reproductive system related to physiological functions, biochemical and hormonal processes. The distribution of respondents is influenced by the geographical and demographic conditions of the area of a place. Everyone's developmental psychology is influenced by gender differences and genetic factors. Differences in sex or gender in individuals from the start can be considered as a biological basis that allows for differences in behavior between women and men [9].

Based on the results of data analysis from Table 2, shows the measurement of IQ levels from all aspects (understanding, memory, logic, creativity,

and knowledge) before and after acupuncture therapy with the Zhu Scalp method and body acupuncture shows that there is a significant difference $p < 0.05$. The measurement of the level of EQ from all aspects (self-regulation, social interaction, independence, competence, and sensitivity) before and after acupuncture therapy with the Zhu Scalp method and body acupuncture, showing a significant difference in $p < 0.05$.

There are many theories to explain that acupuncture therapy methods can affect the improvement of the physiological functions of the human body, one of which is intelligence. The oldest theory in the Chinese Meridian System suggests that acupuncture points can be electrically located and considered to be part of the body's electromagnetic energy field. Acupuncture therapy has the benefit of improving cognitive function due to an increase in cell proliferation in several brain regions. Acupuncture has shown positive benefits in cases of sleep disturbances, depression, cancer, and other chronic disease populations as well as being able to stimulate children's growth and development [10].

Based on the results of the analysis of the IQ level measurement of before and after acupuncture therapy Zhu Scalp method on all aspects showed a significant difference $p < 0.05$. This is due to the stimulation of the Zhu Scalp method of acupuncture therapy which is carried out routinely. The Zhu Scalp acupuncture method is one of the modern innovative therapies of acupuncture on the scalp area. Zhu Scalp acupuncture in the eding zone area can improve cognitive function and increase cerebral blood flow [11]. The area in Zhu Scalp acupuncture is known to be able to improve children's intellectual and emotional intelligence, namely in the eding zone area, which is 1 cun wide from Shenting (DU 24) to Baihui (DU 20)

with an area of 0.5 cun to the left, right, anterior and posterior, parallel to the tip of the nose [11]. The area of intervention is based on a system of somatotopic reflexes regulated on the surface of the scalp. The needles are inserted subcutaneously into various zones which are specific areas through which the central nervous system, endocrine system, and ducts are transported. This zone is associated with the cerebrum and cerebellum areas that are responsible for motor activity, sensory, sight, speech, hearing, and balance so it is very significant for the stimulation of children's intelligence [10]. Zhu Scalp acupuncture can also help strengthen the immune system and prevent disease. The results of the study showed that Zhu Scalp acupuncture worked in parallel and significantly improved cognitive function, activities of daily living, and quality of life in patients. Acupuncture stimulation can increase antioxidant activity, namely superoxide dismutase (SOD) and glutathione peroxidase in the hippocampus. With this antioxidant, there will be a decrease in lipid peroxidase (LPO) activity which can cause damage to cell structure and function. Acupuncture treatment can significantly increase the activity of SOD in the brain and reduce brain tissue damage caused by free radicals, indicating that the results in memory consolidation are closely correlated with changes in LPO and SOD in the brain [12]. In addition to this, the development of intelligence with acupuncture can be influenced through a routine and continuous stimulation process [10].

Based on the results of the analysis of the IQ and EQ level measurement on before and after acupuncture therapy body acupuncture method on all aspects showed a significant difference $p < 0.05$. This is because the intervention given to the body acupuncture method has a positive impact, namely being able to increase blood circulation, more oxygen is produced so that it can stimulate and nourish brain tissue properly and is able to stimulate the brain related to the level of intellectual intelligence. Acupuncture can improve learning ability which is a part of cognitive function by increasing the regulation of glycometabolic enzymes [13], [14]. Acupuncture points are actually located just below the surface of the skin, although there are many different points related to certain functions or body parts. Nerve pathways are physical structures that facilitate acupuncture therapy. Nerve endings throughout the body are connected via the spinal cord in the spinal cord to certain areas of the brain by a system of neural pathways. Stimulation of certain acupuncture points encourages the cerebral cortex, hypothalamus, and finally the pituitary gland to chemically reduce neurotransmitters and hormones [15]. Acupuncture therapy using needles inserted at acupuncture points can also be used to reduce symptoms of physiological disturbances felt by patients, including pain [16], [17].

Based on the average results of N-Gain-Persen or the effectiveness value of the measurement

of IQ and EQ of the Zhu Scalp method and the body acupuncture method in Table 3, the Zhu Scalp method is more effective than the body acupuncture method. This is because the Zhu Scalp acupuncture method works on the principle of reducing the level of lipid peroxidation in the brain, increasing the body's ability to scavenge reactive oxygen species, and oxidizing and preventing further damage, thereby contributing to patient recovery [18]. In Zhu Scalp the eding zone area is able to increase enthusiasm, eliminate fear, increase concentration and help the flow of qi and blood to the brain to be smooth so that the brain has sufficient nutrition to carry out its functions [12].

Although the Zhu Scalp acupuncture method is more effective than the body acupuncture method; the results of data analysis showed that there was a significant change, namely an increase in IQ and EQ in the body acupuncture therapy method. In this method, the selected acupuncture points are GV.20 Baihui, Sishenchong (EX-HN1), Naohu (GV 17), Fengchi (GB 20), Benshen (GB 13), Neiguan PC.6, Zusanli ST.36. This point was chosen because according to its function, one of which is to launch the flow of qi and blood to the brain, it has an important effect on intelligence. In acupuncture, the brain is a sea containing marrow distributed up to the skull. Acupuncture therapy to increase intelligence is done by selecting acupuncture points in the head area, namely points located on the vertex, Sishenchong (EX-HN1) and Baihui (GV 20) which are used to induce resuscitation, launch qi and blood meridians to the brain, strengthen the marrow and increase intelligence. Baihui (GV 20) and Naohu (GV 17) are skewered to benefit the brain and strengthen the marrow. Regarding the gallbladder meridians, Fengchi (GB 20) and Benshen (GB 13) are used to promote the flow of qi to the brain, to improve brain function. As the connecting point of the pericardial Luo meridian, Neiguan (PC 6) is used to calm the mind to relieve mental stress and regulate the functional activity of the triple energizer vital energy, which is the basis for maintaining normal mental and spiritual activities. The important thing is that the Zusanli function (ST36) can be used to compensate for congenital deficiencies by strengthening the necessary conditions [19], [20].

Ideally, a person can master cognitive skills as well as social-emotional skills. The most basic difference between IQ and EQ is that EQ is not influenced by heredity, thus opening up opportunities for parents and educators to continue what nature has provided so that children have a greater chance of success. Emotions play a very important role in a child's development. Emotions are feelings or affections that arise when a person is in a situation or an interaction that is considered important by him, especially his own well-being. The pattern of emotional development is influenced by hereditary factors, the environment, and the child's health

condition. The emotional pattern of childhood shows a tendency to persist into adulthood, unless the child experiences radical changes in the situation, both in the environment (personal-social relationships) and physical health [21], [22].

The level of emotional intelligence is not related to genetic factors but can be developed and stimulated in childhood. Unlike IQ, which changes only slightly after passing through adolescence, EQ is mostly obtained through learning from one's own experience so that skills can continue to grow. If suggestions are plugged into the child's subconscious in prime condition, the results will be more optimal. Likewise, suggestions about sensitivity, competition, independence, self-awareness, and good social interaction given continuously will be able to change the child's character as desired. The results show that EQ has a much more significant role than IQ. IQ is only a minimum requirement in achieving success, but the real and proven EQ leads a person to the peak of achievement [23], [24]. In several studies conducted on the effect of acupuncture on cognitive decline disorders due to surgical disorders or chronic diseases, it turned out to show significant results because it was able to improve cognitive functions including learning abilities and memory [25], [26]. In research on the effect of acupuncture on acetyl-cholinesterase function in the brain, especially the hippocampus, it was found that acupuncture can increase the function of acetylcholinesterase in the hippocampal CA1 and CA3 which stimulates and improves intelligence, memory, and concentration [27], [28]. Intelligence is an ability that is acquired through heredity, an ability that is inherited and possessed from birth and is not too much influenced by the environment. To a certain extent, the environment plays a role in the formation of children's intelligence abilities.

The limitation of the research is that research activities were carried out during the Covid-19 pandemic, this affected environmental conditions on children's behavior. Factors that influence and are difficult to control in this study are social and non-social environmental factors. The social environment includes family and interactions in society, while the non-social environment includes the surrounding natural conditions, namely physical, chemical and biological. The environment is a very decisive factor in achieving or not achieving a child's genetic potential. Children's social behavior and attitudes reflect the treatment they receive at home. During the pandemic, children study at home so that interaction between children and friends and other individuals is limited. However, the contribution of the research results shows that the Zhu Scalp acupuncture method and the body acupuncture method can increase IQ and EQ so that they can be applied to the management of acupuncture therapy, especially to improve child growth and development.

Conclusion

Zhu Scalp's acupuncture method and body acupuncture method are effective for increasing IQ aspects: understanding, memory, logic, creativity, and knowledge and improving EQ aspects: Self-regulation, social interaction, independence, competence, and sensitivity; in pre-school children at Kanisius Kindergarten, Mayang, Gatak Sukoharjo. The Zhu Scalp acupuncture method is more effective than the body acupuncture method in increasing IQ and EQ.

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