International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067; Impact Factor: RJIF 5.24
Received: 31-05-2019; Accepted: 02-07-2019
www.sportsjournal.in
Volume 4; Issue 5; September 2019; Page No. 07-10

Efficacy of yogic games on problem solving capacity of orphan children

Poornima Gupta[1], Vivek Maheshwari[2]
[1] Ph.D. Research Scholar, Department of Yoga and Science of Living, Jain Vishva Bharati Institute, Ladnun, Rajasthan, India
[2] Associate Professor, Department of Ashtang Yoga, Lakulish Yoga University, Ahmedabad, Gujarat, India

Abstract
Problem solving capacity is a plan of action used to find a solution and it is highly associated with brain functions. Orphan children are more intent to decline in problem solving capacity because they seriously suffer from physical, physiological and mental disorders. The purpose of this study was to evaluate the efficacy of yogic games on problem solving capacity of orphan children. 100 Orphan children of age ranging from 12-16, were selected from Surman Sansthan, Jaipur, Rajasthan, by accidental sampling and assigned into experimental and control group. Experimental group underwent three months of Yogic games program whereas the control group followed the routine activities. They were assessed by Problem solving ability test at the beginning and end of the program. After 3 months of yoga, result suggested that yogic games practice enhances problem solving capacity with coordination, processing speed, creative thinking, and reasoning ability.

Keywords: yogic games, problem solving capacity, orphan children

1. Introduction

Children are the great and strong pillars of the nation. They are capable of building a strong and wonderful future for the society. Every child is a new bud and if given the right direction, support, guidance, love, and friendly environment, they can surely bloom like a flower. Family and relatives play a great and unique role in developing child's physical, mental, and emotional wellbeing. In other words family is a powerful determinant of a child's holistic development because happiness, warmth, support, love, care, discipline, and guidance are the basic elements for the healthy growth of a child. But there are many children who are orphan due to various reasons such as – parents' death, chronic illness, divorce, broken family, poverty etc. A new study by an international children's charity has found that 4 per cent of India's child population of 20 million are orphans (Chauhan, 2011). A mentally unhealthy child suffers greatly from mental and emotional imbalance. Parental loss and raising in orphanages have negative impact on physical, psychological and social well-being in orphans. Many children find it difficult to adapt to the new changes. This stress may be shown in symptoms of confusion, anxiety, depression, and behavioral disorders such as disobedience. The same symptoms may cause learning problems. Children who are unsatisfied, awful, and miserable may fail to concentrate in class and therefore perform badly. Researchers have now affirmed that trauma does indeed change a person's cerebrum neurochemistry and seriously influences their mental health. These changes can cause a host of difficulties for the child's life (curry, 2015) [5]. Many of the orphans had disturbingly low levels of brain activity? "Instead of a 100-watt light bulb, it was a 40-watt light bulb (Hamilton, 2014) [11].

Form the above mentioned researches, it be safely concluded that there exists a noteworthy relationship between disregard and the anatomical integrity of white matter. Various such research have found a significant reduction in gray and white matter which play an essential role in the association between various parts of the brain and also discovered nervousness issue, potential issue, emotional issues, sadness, due to loss of connection and cells. In other words, their brains were quite smaller.

The problem solving is a procedure of overcoming complications that appear to interfere with the completion of a goal. This is the frame work or pattern within which creative thinking, reasoning, team-work, exploring skills, emotional intelligence and decision making takes place. It is the ability to think and reason on given levels of complexity. Every child can take advantage from having good problem solving skills as we all come across to the problems on a daily basis. Some of these problems are clearly more severe or complex than others. Simple problems can be solved by instinctive and habitual behaviors. This indicates that there are levels of problem solving capacity – ranging from average to the highest ability depending upon the difficulty level of the problem.

The person exercises his greatest effort and uses all his abilities such as intelligence, thinking, imagination, observation etc. to overcome the state of tension which is created in his mind when he faces a problem. Because problem solving ability depends on how the brain functions, some individuals are able to solve the problems sooner than others. Our brain is divided into different areas each of which is responsible for performing different functions. The Frontal lobe is concerned with purposeful acts such as creativity, judgment, problem solving, planning, abstract reasoning and logical thinking. (Nkonki, 2018) [17].

Therefore, it is necessary that we try to develop intelligence and problem solving capacity and work on brain conditioning and development through proper education and training of our children.

"Each soul is potentially divine", proclaims the great Swami Vivekananda who says the goal of life is to manifest this divinity within. This statement of his is in tune with the Upanishad proclamation, "*Sarve - Amrtasya Putrah"* (Nagendra *et al*., 2013) [16]. Playing games properly can

achieve the divine goal. But few people are aware of the real importance of games, their scope and depth and the way they affect personality. Real personality and character of a person is revealed during his participation in a game and his reaction to the failure and success, to the fair and foul play etc. "We can discover more about a person in an hour of play than in a year of conversation" says Pluto, the great philosopher (Pol, 2015) [18].

Games not only reveal one's character, they form it. One who appreciate games in true spirit, regardless of achievement and failure, ups and downs, learns to enjoy life like Sri Krishna. We call Lord Krishna Yogeshawra, the Great master of yoga because he challenged all the problems and difficulties of life, from his very childhood, in a lively and playful way. That is why it is called Leela, the play.

Psychologist agree that games allow us to give free vent to repressed feelings and in this way, release a lot of stress. They help us control our excitements and culture our emotions. Group games generate a field of energy, breaking the obstacles of Tamas, transforming Rajasic energy into Satvic (Pol, 2015) [18]. Games cover not only the elements of all physical exercise viz., stamina, strength, body-building, flexibility, quick reflexes, and agility, adventurous and initiative but also develop mental abilities like I.Q., memory, concentration, and creativity, reasoning skills. Games develop the most needed spiritual quality in person – awareness, alertness or wakefulness.

A game is a process of all round personality development – physical, mental, emotional and spiritual. It plays an important part in this process. Games turn into yoga, if we keep continuous alertness while playing, which in turn brings affection, harmony, peace and happiness. So, understanding the impact of Yogic games on holistic development of orphans may be essential in providing possibilities for helping the problem solving capacity to overcome various tragedies in their upcoming life. Very few studies have looked at the effect of Yogic Games on orphan children with problem solving capacity. In this context, there is a pressing need to test the effect of Yogic Games for orphan, with the objective of helping them enhance their problem solving capacity as well as improving mathematical ability, creativity, and abstract reasoning ability. In sum, the present study was intended to evaluate the efficacy of Yogic games on problem solving capacity of orphan children.

Material and method

Participants

The study was conducted at an orphanage in Jaipur. 100 subjects were chosen by accidental sampling and they were divided equally into experimental group and control group. The study was based on the inclusion and exclusion criteria. Orphans of any gender between the ages of 12-16 were included on the basis of inclusion criteria and orphans with no chronic diseases and not being physically or mentally challenged were included on the basis of exclusion criteria.

Design

Pre-post multi experimental-control group research design was adapted in this study.

Experimental protocol

All the assessment was conducted in the orphanage after familiarizing the participants as well as the concerned authorities with the testing procedure and the study protocol. The problem solving capacity was recorded at the beginning and at the end of the study period i.e. three months.

Intervention

The experimental Group followed a combined approach of Yogic games for 30 min, daily, for 3-months. The details of the intervention (Yogic games) are as follows:

Table 1

Yogic Game	Days	Timing
Model Quiz	Monday, Wednesday, Friday	10 minute
Memory game	Tuesday, Thursday, Saturday	10 minute
Let us eat	Monday, Wednesday, Friday	10 minute
Counting no.	Tuesday, Thursday, Saturday	10 minute
Finding out	Monday, Wednesday, Friday	10 minute
Post man	Tuesday, Thursday, Saturday	10 minute

- **Model Quiz:** first of all divide the players into groups then select a quiz format such as audio, visual, model that the entire group will involve in the session.
- **Memory game:** In this game the beginner of the game will tell his/her name to the second person and the second player will repeat the first person's name and tells his name. The game goes on like this. If a person fails to repeat the names, is out. In place of individual names, name of saints, gods, eatable etc., can be used.
- **Let us eat:** Players sit in a circle and the conductor saying some eatable name, all players should raise their hands and say loudly Eat. If the conductor say other name except an eatable and any player found raising his hand is out.
- **Counting numbers:** The instructor stands in the center and asks the players sitting in a circle to call numbers progressively in the ascending order, alternatively in different two or three languages, that is, if the first person says "one" in English, the next should say "do" in Hindi, 3rd person "three" in English and so on. Those who don't follow the order correctly are out.
- **Finding Out:** A circle is formed and one player "X" goes out, others who sit in a circle choose any name of animal, flower, fruit, or leader. When X returns back, he has to find out the name which they have chosen by asking questions about the nature of the above mentioned. Questions are restricted to 5 to 10. The answers given by the participants to the questions asked will be only yes or no.
- **Post Man:** It is a type of awareness, memory, or concentration game. All participants sitting in a circle. Each one will call name of a city or a country. Everybody should remember the names uttered by the players. Now umpire asks any one of the player say X to deliver a letter to say 'Delhi'. X has to go to that player who is called Delhi. If X goes to wrong player, that particular person gives a good punch on X's back indicating the wrong delivery of letters and hence is redirected by putting that post office's seal (punch).

Assessment

Problem Solving Ability test constructed by L.N. Dubey and C.P. Mathur was used. This test is highly correlated with intelligence, reasoning ability and mathematical ability. PSAT had 20 items which were highly distinguishing. Each of the 20 items had four alternative answers, and the correct answer is awarded 1 score. The reliability of the test was

calculated by split-half method (0.78) and by Kuder-Richardson (0.76) formula. Validity was tested by way of correlation it's score on a parralel from or test, and it was tested against two test, viz., R.K. Tendon's group intelligence test (0.68), and Test of reasoning ability (0.85).

Procedure

The problem solving ability test was administered on children of both the groups (experimental and control) at the beginning and at the end of the intervention (yogic games program). The experimental group underwent 3 months of yogic games activities, whereas the control group was asked to continue with their normal routine. After 3 months of intervention, all children were asked to complete the same test. The researcher explained about the study and gave stipulated instructions of the manuals to children for better understanding. Children were not given feedback as to their performance on designing experiments or any of the measures.

Statistical analysis

Analyses of pre and post intervention data within group was done by paired sample t-test by using SPSS version 22, for statistical analysis. The directional hypothesis was set at 0.05 level.

Result

Table-1 shows the paired t-test values (of before and after intervention) for the experimental group and the control group. It is revealed that the problem solving capacity with all the dimensions (creativity, decision making, mathematical ability, and reasoning ability) was significantly improved in the subjects of experimental group. From the data collected experimental group mean obtained for problem solving ability in the pre-test is 6.64, SD is 3.35 and for the post test mean is 8.20 and SD is 2.83, df 49, t-value obtained is 9.78 that is significant at 0.01 level. In contrast there were no significant changes in the control group.

Hence the directional hypothesis is accepted. So we can say that there is a significant difference between yogic games and problem solving ability.

Table 1: Comparison of before and after intervention values within group

Group	Assessment	Mean	S.D.	R	t-value	Level of significance
Experimental group (N=50)	Pre	6.64	3.35	.97	9.78	0.01 level
	Post	8.20	2.83			
Control group (N=50)	Pre	6.24	2.97	.97	1.18	Non-significant
	post	6.36	2.94			

Graphical representation of Mean values of experimental and control groups after three months, when compared to their respective pre condition

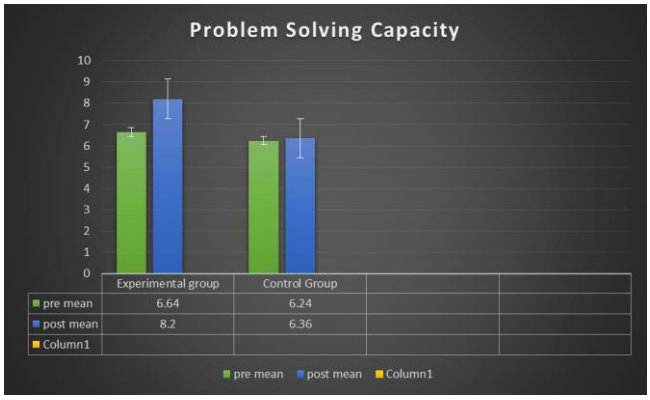

Fig 1

Discussion

The present study showed a significant improvement in the mean score of the problem solving ability test in the experimental group, following three months of Yogic Games program which had a positive impact on different sub-element of problem solving ability such as creative thinking, decision making, intelligence, reasoning, and mathematical ability etc. Some cognitive psychologists think of problem solving as the essence of cognition. They feel that cognition refers to the ways in which we gather and use information in pursuit of solution to the problems (Houston, 1981) [12]. Cognitive abilities are brain-based skills we need to carry out any task from the simplest to the most complex. Mental activity is like a software and the brain itself is like a hardware. We are constantly using our brain functions - It's impossible to do almost anything without engaging at least some of the cognitive functions. The cerebral cortex of the brain is responsible for higher thought processes. It consists of gray matter arranged in folds that cover the cerebrum and is located in the front part of the brain. The cerebral cortex is highly developed in humans and is also involved in higher cognitive, sensory, emotional and motor functions (Kurzweil, 2017) [14]. Research has shown that mindfulness exercises, fun activities, traditional martial art and computer based learnings have a direct effect on executive functioning and bring neurological changes in the structure of the brain and may affect specific cognitive functions such as perception, thinking, attention, reasoning ability etc. (Diamond A, 2012; Slagter, 2007) [6, 23]. (Erickson *et al*., 2015; Sibley & Etnier 2003) [7, 21] have found that more physically active and fit preadolescent children shows greater hippocampal and basal ganglia volume, greater white matter integrity, elevated and more efficient patterns of brain activity, and superior cognitive performance and scholastic achievement.

Current advances in gaming research support that cognitively demanding digital games as well as non-digital board and card games improved cognitive abilities (Cheng *et al*., 2013; Fissler *et al*., 2013; Powers *et al*., 2013) [4, 9, 28]. These

gaming-induced benefits comprised short-term and working memory (Basak *et al*., 2008; Anguera *et al*., 2013; Cheng *et al*., 2013) [2, 1, 4], Executive control (Fissler *et al*., 2013), reasoning, and spatial abilities, problem solving ability (Feng *et al*., 2007; Shute *et al*., 2015) [8, 20]. (Gray, 2015) [10] found that gaming improved executive function such as memory, efficient problem solving or decision making, and spatial attention.

Conclusion

In sum, on the basis of above researches and the findings of this study results revealed that regular practice of Yogic games, helps in bringing a qualitative change in problem solving capacity, abstract reasoning, thinking, perception, mathematical ability and brain functions. It is concluded that there is a significant positive relationship between Yogic Games and Problem Solving capacity in orphan children.

References

1. Anguera JA, Boccanfuso J, Rintoul JL, Al-Hashimi O, Faraji F, Janowich J, *et al*. Video game training enhances cognitive control in older adults. Nature. 2013; 501:97-101. doi: 10.1038/nature12486
2. Basak C, Boot WR, Voss MW, Kramer AF. Can training in a real-time strategy video game attenuate cognitive decline in older adults? Psychol. Aging. 2008; 23:765-777. doi: 10.1037/a0013494
3. Chauhan Chetan. 20 million young orphans: India's abandoned children, 2011, Hindustan Times. Retrieved from www.hindustantimes.com./Delhi-news/about-20m-kids-in-india-orphans-study/story.
4. Cheng ST, Chow PK, Song YQ, Yu E, Chan A, Lee T. Mental and physical activities delay cognitive decline in older persons with dementia. Am. J. Geriatr. Psychiatry. 2013; 10:1-13. doi: 10.1016/j.jagp. 2013.01.060
5. Curry Elizabeth. Things You Should Know about How Orphanage Life Affects Children. Retrieved from, 2015, https://adoption.com/5-things-know-about-how-orphanage-life-affects-children/
6. Diamond A. Activities and programs that improve children's executive functions. Curr Dir Psychol Sci. 2012; 21(5):335-341. doi: 10.1177/0963721412453722
7. Erickson Kirk I, Charles H Hillman, Arthur Kramer F. Physical activity, brain and cognition. Behavioral science. 2015; 4:27-32.
8. Feng J, Spence I, Pratt J. playing an action video game reduces gender differences in spatial cognition. Psychol. Sci., 18, 850–855. doi: 10.1111/j.1467-9280.2007.01990.x
9. Fissler P, Küster O, Schlee W, Kolassa IT. Novelty interventions to enhance broad cognitive abilities and prevent dementia: synergistic approaches for the facilitation of positive plastic change. Progress in Brain Research. 2013; 207:403-434. Doi: 10.1016/B978-0-444-63327-9.00017-5.
10. Gray Peter. Cognitive benefits of playing video games. Psychology today. Retrieved from, 2015, https://www.psychologytoday.com/us/blog/freedom-learn/201502/cognitive-benefits-playing-video-games.
11. Hamilton Jon. Orphans' Lonely Beginnings Reveal How Parents Shape A Child's Bria. Retrieved from, 2014, https://www.npr.org. Retrieved on 2/9/18.
12. Houston John P. Fundamental of learning and memory. (2nd Ed., 1981, 436-439). https://doi.org/10.1016/C2013-0-10869-0
13. Kinship United. The devastating effect of trauma on orphans. Retrieved from, 2016, https://kinshipunited.org/the-devastating-effects-of-trauma-on-orphans/
14. Kurzweil Morton. What parts of your brain is responsible for logic or complex thinking? Retrieved from, 2017, https://www.quora.com/What-part-of-your-brain-is-responsible-for-logic-or-complex-thinking
15. Dubey LN, Mathur CP. (n.d.). Problem Solving Ability Test. National Psychological Corporation, Agra.
16. Nagendra HR. Sudheer Deshpande, Manjula. Krida yoga- Physical stamina. Bengaluru: Vivekananda Kendra prakashan trust, 2013.
17. Nkonki Siphiwo. Brain areas and their functions. Health, 2018, retrieved from https://www.health24.com/Mental-Health/Brain/Anatomy-of-the-brain/Brain-areas-and-their-functions
18. Pol Dattaram. Krida yoga. (8th Ed.). Kanyakumari: Vivekananda Kendra prakashan trust, 2015.
19. Powers K, Brooks P, Aldrich N, Palladino M, Alfieri L. Effects of video-game play on information processing: a meta-analytic investigation. Psychon. Bull.Rev. 2013; 20:1055-1079. doi: 10.3758/s13423-013-0418-z
20. Shute VJ, Ventura M, Ke F. The power of play: the effects of Portal 2 and Lumosity on cognitive and no cognitive skills. Comput. Educ. 2015; 80:58-67. doi: 10.1016/j.compedu.2014.08.013
21. Sibley Benjamin A, Jennifer Etnier L. the Relationship between Physical Activity and Cognition in Children: A Meta-Analysis. Human kinetics journal. 2003; 15(3):243-256. https://doi.org/10.1123/pes.15.3.243
22. Skills You Need. (n.d.). Problem solving. Retrieved from https://www.skillsyouneed.com/ips/problem-solving.html
23. Slagter HA, Lutz A, Greischar LL, Francis AD, Nieuwenhuis S, Davis JM, Davidson RJ. Mental training affects distribution of limited brain resources. PLOS Biology. 2007; 5(6):138. https://doi.org/10.1371/journal.pbio.0050138