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RESEARCH ARTICLE

EFFECT OF YOGA ON ATTENTION LEVEL OF ORPHAN GIRLS WITH ADHD.

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Abstract

Mental health issues among children living in orphanages have been rising. These children often suffer from psychiatric disorders such as Attention Deficit Hyperactivity Disorder (ADHD). ADHD is characterized by inattention, hyperactivity and impulsivity. These symptoms are high among orphan children. Yoga is considered as a very effective method among complementary and alternative medicines which has a positive therapeutic impact on the neuropsychological problems.

Objective: This study is to assess the attention level of the orphan female children with ADHD, undergoing training of ADHD yoga module developed by NIMHANS, 1 hour daily for 8 weeks by a qualified yoga instructor.

Materials and Methods: A total of 38 female children aged between 6 to 10 years participated in this study with a single group pre-post test design. The raw data was collected by using NICHQ Vanderbilt assessment scale before and after the intervention. Statistical Package of Social Science version 20 was used for data analyses. The Shapiro Wilk test showed that the data was not normally distributed. The Wilcoxon's signed rank test was used to compare the means of the data.

Results: The data analyses showed significance improvement in the attention level at both Parent Assessment Scale (7.14 ± 4.14 vs. 3.66 ± 2.91) and Teacher Assessment Scale (7.46 ± 4.21 vs. 3.73 ± 2.61).

Conclusion: This pre-post single group study suggests that 8 weeks yoga practice gradually increases the attention level of the orphan female children. Additional well-designed study with larger samples and complex design are recommended for generalisation.

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Introduction:-

Children are the future citizens of our country. They need to be nurtured well to be a part of the society in the best possible way in future. Unfortunate are the ones who are orphans, who lack the love of the parents, have poor economical background and grow up in inconducive environment. Moreover, surroundings also make them feel that they are a burden to the society.

Children living in the orphanage face unsafe environment which impacts their overall development because of malnutrition, lack of adequate space and lack of parental love((Nikulina V, Widom et al, 2015) and also they have some neuropsychological difficulties which include inattention, hyperactivity and impulsivity(Vadalà R et al, 2011).

Neuropsychiatry is concerned with disorders of attention, cognition and behaviour that arise from overt disorder in cerebral function, or from indirect effects of extra cerebral disease(Pitkanen MLS *et al*,2010).

ADHD is a neuropsychiatric disorder characterized by inattention, hyperactivity and impulsivity either alone or combination(Krain AL *et al*, 2006) that commonly occurs among school-aged children, with approximately 5–8% of children being affected. Moreover, the symptoms of the disorder persist into adulthood in up to 60% of childhood cases, meaning that roughly 4% of adults suffer from ADHD(Froehlich TE *et al*, 2007) and it is also associated with functional impairments across multiple academic and social domains and is commonly accompanied by a range of externalizing and internalizing disorders(Vadalà R *et al*, 2011).

Yoga is a systematic body of knowledge concerned with the physiological and mental processes that change the physiology of the body through respiratory manipulation(breathing techniques), postures, and cognitive control(relaxation and meditation)(Jensen PS, *et al*, 2004). Yoga interventions aim to help an individual to develop self-regulatory behaviors and monitoring techniques in which he or she can become more aware of his or her physical sensations and impulses(Zipkin D *et al*, 1985).

ADHD is frequently co morbid with Oppositional Defiant Disorder, Conduct Disorder, anxiety disorders, and other behaviour disorders that contribute to its severity and persistence. Yogic practices have been found to improve emotional states and the symptoms of anxiety(Jensen PS *et al*, 2004).

Rauhala et al. (1990) and Telles et al.(1997) demonstrated that boys and girls suffering from social and emotional difficulties, anxiety, fear and aggressive behaviour benefited from practicing yoga(Jensen PS *et al*, 2004).Yoga has been shown to be a viable alternative to the traditional treatment methods for ADHD, particularly with regard to improving the attention and concentration levels of students(Petsche A *et al*, 2016).

However, the changes in the attention level of the orphan female children that characterise the efficacy of ADHD Yoga module have not been reported adequately. Hence, the present study was designed to assess the effect of yoga intervention on the attention level of the orphan female children. The main objective of the study was to assess the attention level of the orphan female children by using ADHD yoga module.

Materials and Methods:-

The subject for the study was obtained from Navajeevan and Rainbow home, Chamarejpet, Bengaluru.

Inclusion criteria:-

1. Children between the age group of 6-10years.
2. Children who were willing to participate in yoga training.
3. Children who were diagnosed with ADHD.
4. Children who could understand the instruction given in Kannada and English.

Exclusion criteria:-

1. Children who were not willing to participate yoga training.
2. Children who were not diagnosed with ADHD

Design of the study:-

A single group pre-post test research design was chosen for the study.

Informed consent:-

The informed consent was obtained from both the participants and head of the orphanage home before the commencement of the study. The study was approved by the Institutional Review Board (IRB) of S-VYASA University.

Intervention:-

Yoga intervention was given for 8weeks, 1hour daily for 5days/week and one day of Krida yoga as a motivational factor. Yoga was taught by an expert yoga instructor.

Procedure:-**ADHD Yoga Module:-**

ADHD Yoga module developed by NIMHANS was used as yoga intervention(Hariprasad VR *et al*, 2013). It includes-

Shithilikarana_Vyayama (Loosening exercise)-Loosening exercise, Jogging, Spinal twist, backward and forward bending cycling (forward and backward).

Asana(Yogic Posture)-Tadasana(palm tree posture),Ardha chakrasana(half wheel posture),Padahastasana(hand feet posture), Ardhakati chakrasana(half waist posture),Vajrasana(diamond posture),Suptavajrasana(supine thunderbolt pose),Marjrisana(cat pose),Paschimottasana(seated farward bend),Shasankasana((rabit pose),Ustrasana(camel pose),Bhujangasana(cobra pose),Pavanamuktasana(wind-relieving pose),Sarvangasana(shoulder stand pose), Shavasana etc.,

Pranayama (Yogic breathing)-Kapalbhati Kriya, Surya Anuloma Viloma(right nostril breathing), Chandra Anuloma Viloma(left nostril breathing),Nadishuddhi pranayama(alternate nostril breathing), Bhramari pranayama(humming sound while exhalation) and Ujjayi. Meditation (Dharana-Dhyana)-Nadhanusandhana A-U-M.

Data Assessment:-

The symptoms of ADHD were assessed at the baseline and after 8weeks yoga intervention using NICHQ Vanderbilt Assessment Scale.

The Vanderbilt ADHD Rating Scale was developed by Mark Wolraich and were placed in the public domain(Wolraich ML *et al*, 2013).

National Institute of Children Health Quality Vanderbilt Assessment Scale is a self report measure with 55 items developed for Parent Assessment and 43 items developed for Teacher Assessment for individuals with ADHD(Guest W, Me R.2013).

It is a validated and reliable tool to diagnose the symptoms of ADHD(Bard DE, Wolraich *et al*,2013).

The initial assessment scales, parent and teacher, have two components: Symptoms assessment and Impairment in performance. On both parent and teacher initial scales, the symptoms assessment screens for symptoms that meet criteria for inattentive (item1-9) and hyperactive (item10-18) ADHD. Impairment in performance screens meet the criteria for Oppositional-Defiant Disorder (item19-26), Conduct Disorder(item 27-40) and Performance questions(item 48-54) for Parent assessment scale. In Teacher assessment scale Impairment in performance screens meet the criteria for Oppositional-Defiant/Conduct Disorder (item 19-28), Anxiety/Depression (item29-35) and performance questions (item36-43).

It follows closely the criteria set forth in DSM-IV (Diagnostic and Statistical Manual – IV).

The estimates of coefficient alpha ranged from 0.91 to 0.94(Bard DE *et al*, 2013)

Data analysis:-

Statistical analysis of the data was performed by using SPSS version 20.0. The Shapiro Wilk test showed that the data was not normally distributed. Wilcoxon signed rank test was used to compare the means of the data before and after the yoga intervention.

Result:-**Parent Assessment Scale Results:-**

Table-1:-Effect of yoga on Predominant Inattentive Subtype (PIS)

Variable	N	Mean		SD		% change	P
Predominant	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	46.21↓	.000*

Inattentive Subtype		9.24	4.97	4.58	3.53		
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*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on PIS was highly significant.

Table-2:-Effect of Yoga on Predominantly Hyperactive/Inattentive Subtype (PH/IS)

Variable	N	Mean		SD		% change	P
Predominantly Hyperactive/Inattentive subtype	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	46.30↓	.000*
		7.45	4.00	4.42	2.92		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on PH/IS was highly significant.

Table-3:-Effect of Yoga on ADHD Combined Inattention/Hyperactivity (ADHD Combd.)

Variable	N	Mean		SD		% change	P
ADHD Combined Inattention /Hyperactivity	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	53.89↓	.000*
		9.24	4.26	4.97	3.85		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on ADHD Combined was highly significant.

Table-4:-Effect of Yoga on Oppositional-Defiant Disorder Screen (ODDS)

Variable	N	Mean		SD		% change	P
Oppositional-Defiant Disorder Screen	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	46.71↓	.000*
		6.08	3.24	3.85	2.58		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on ODDS was highly significant.

Table-5:-Effect of Yoga on Conduct Disorder Screen (CDS)

Variable	N	Mean		SD		% change	P
Conduct Disorder Screen	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	44.84↓	.000*
		5.24	2.89	3.75	2.48		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on CDS was highly significant.

Table-6:-Effect of Yoga on Anxiety/Depression Screen (A/DS)

Variable	N	Mean		SD		% change	P
Anxiety/Depression Screen	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	53.28↓	.000*
		5.63	2.63	3.24	2.11		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on A/DS was highly significant.

Teacher Assessment Scale Results:-

Table-1:-Effect of Yoga on Predominantly Inattentive Subtype (PIS)

Variable	N	Mean		SD		% change	P
Predominantly Inattentive subtype	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	48.32↓	.000*
		9.58	4.95	4.94	3.15		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on PIS was highly significant.

Table-2:-Effect of Yoga on Predominantly Hyperactive/Impulsive subtype (PH/IS)

Variable	N	Mean		SD		% change	P
Predominantly Hyperactive/Impulsive Subtype	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	49.47↓	.000*
		7.66	3.87	4.62	2.60		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on PH/IS was highly significant.

Table-3:-Effect of Yoga on ADHD Combined Inattention/Hyperactivity (ADHD Combd.)

Variable	N	Mean		SD		% change	P
ADHDCombined Inattention/Hyperactivity	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	53.24↓	.000*
		8.79	4.11	4.68	3.02		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on ADHD Combined was highly significant.

Table-4:-Effect of Yoga on Oppositional-Defiant/Conduct Disorder Screen (OD/CDS)

Variable	N	Mean		SD		% change	P
Oppositional- Defiant/Conduct Disorder Screen	38	Pre-yoga	Post-yoga	Pre-yoga	Post-yoga	48.63↓	.000*
		5.84	3.00	3.88	2.37		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on OD/CDS was highly significant.

Table-5:-Effect of Yoga on Anxiety/Depression Screen (A/DS)

Variable	N	Mean		SD		% change	P
Anxiety/Depression Screen	38	Pre-Yoga	Post-yoga	Pre-yoga	Post-yoga	49.44↓	.000*
		5.42	2.74	2.93	1.93		

*(p>0.05)

*Wilcoxon signed rank test showed effect of yoga on A/DS was highly significant.

Effect of yoga intervention after 8 weeks (n=38)

SCALE	MEAN ± SD		% change	P Value
	Before	After		
Parent Assessment Scale	7.14 ± 4.14	3.66 ± 2.91	48.73↓	<0.00*
Teacher Assessment Scale	7.46 ± 4.21	3.73 ± 2.61	50.00↓	<0.00*

*Wilcoxon signed rank test

SD: Standard Deviation

The result showed a significant improvement in both Parent Assessment Scale and Teacher Assessment Scale.

Discussion:-

Yoga includes practices such as physical postures, regulated breathing, and meditation among other techniques. Krida yoga is also one of the techniques introducing in the schools which helps the kids in improving their concentration and attention level.

The practice of yoga is as beneficial as in itself, leading to improved health, emotional well-being, mental clarity, and joy in living (Hinduwebsite.com).

Yoga, as an ancient system of exercise, has a great potential to teach children to be mindful of factors that impact their health and improve their total well-being(Chen & Pauwels, 2014).

Previous researches conducted have proved yoga as a complementary therapy in children with moderate to severe ADHD. Yoga showed significant improvements in the symptoms of ADHD which were assessed by using their particular scales(Hariprasad, Arasappa, Varambally, Srinath, & Gangadhar, 2013) and also, yoga can be a alternative therapy and a complementary to sustained attention and discrimination function in children with ADHD(Chou & Huang, 2017).

Other studies also have found a similar increase in the attention level due to yoga technique as an intervention among subjects under consideration(Abadi, Madgaonkar, & Venkatesan, 2008).

Yoga requires long periods of concentration and is therefore supposed to reduce attention deficit.

So, yoga practice has been understood in improving the attention level among ADHD and their school performance(Tucha et al., 2014). Further, Yoga has been proven the positive impact on the Executive Function (EF) of orphan adolescents(Purohit & Pradhan, 2017).

The above studies depict that various unconventional intervention like Yoga has a great potential to teach children to be mindful of all the factors and result in improved their overall well being.

In the present study, yoga was used as an intervention to increase the attention level of the ADHD female children in orphanage. The major findings of this study are that yoga for eight week time period did result in a statistically significant improvement in Attention level.

The NICHQ Vanderbilt Assessment Scale was used to assess the attention level, which has proven that yoga is helpful in improving the attention level along with the Oppositional-Defiant Disorder, Conduct Disorder and Anxiety/Depression among the female orphan children.

The intervention for this study was carried out on a group of 38 female children from the orphanage. Result depicts significant improvement in the attention level of the study group along with all the dependent variables. This could be attributed to the fact that the government school in general, has yoga in its curriculum which is conducted weekly once. The children of this age need much care for the overall wellbeing and for the society. Further research need to be carried out to understand the same.

Conclusion:-

The present study suggests that Yoga enhances the attention level among the orphan female children along with other variables, thus paving the way for their development of overall wellbeing. Additional well designed studies need to be conducted to develop awareness about the efficacy of yoga.

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