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The effect of environmental influence on learning yoga to improve attention and concentration in learning disabled children.

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Abstract

Environment influences the behaviour at different levels. These environments are included as social settings, built environments and informational environments. Learning Disability is a disorder in one or more of the fundamental psychological processes connected in comprehending the use of language, spoken and written. Apart from genetic factors, learning disability is influenced by various environmental factors. This study investigated the effect of environmental influence on learning yoga to improve attention and concentration in learning disabled children. This single blind randomized controlled trial was carried out among 55 children with learning abilities. The participants were divided into three groups, control group with 12 participants, experimental group I (without modified environment) with 24 participants and experimental group II (with modified environment) consisting of 19 participants. Intervention training program was given for three weeks, with 15 sessions. Letter cancellation test (1&2) and digit span test (Wechsler intelligence test) were used to measure the level of attention problem and to measure the level of concentration. There was a significant difference in attention and concentration for learning disabled children between pre and post scores in the experimental groups for both letter cancellation test and digit span test ($P<0.05$). The role of

yoga in a controlled environmental setting plays a significant role in nurturing the learning abilities in children. This can be justified by incorporating yoga as a part of the school curriculum.

Key words: Behavior, Environment, Intelligence, Learning disability, Yoga.

Introduction

Environment influences human behaviour at different levels. These environments are included as social settings, built environments and informational environments. The trait of an individual in a country is moulded by the environment in which he lived during his lifetime. Racial differences in personality can to a large extent be traced to the influence of different environments to which people of different races have been subjected for generations.[1] Among the three temperaments of a personality namely *Sattvik, Thamasik* and *Rajasik*, *Sattvik* temperament is ideal and is characterized by knowledge of the self and also knowledge of the effect of the surroundings on the self. This temperament is said to be holistic, intuitive and well balanced.[2] The environment also influences the manner in which the individuals react to every situation. It has a deep impact on the attitude, sentiments, emotions, general health issues and productivity.

Overall, an individual's well being is highly determined by his/her level of education. It has been therefore emphasized that every child has a right to education and the policy makers and public infrastructure strives to fulfill this right. However, any disorder characterized by learning disability impairs the individual with learning and deprives them of a holistic well being. Learning Disability is a disorder in one or more of the fundamental psychological processes connected in comprehending the use of language, both spoken and written, thereby resulting in a defect in listening, thinking speaking, reading, writing, spelling, or mathematical calculations. Learning disabilities are neurological disorders with impairment in the personal capacity to store, process or produce information, affecting an individual's performance. Singh (2003) reported 3 to 4 percent of children with special needs had access to education with or without support services and Mukhopadhyay & Mani (2002) deduced that only 1 percent of children with disabilities in the 5-15 age group had access to education.[3, 4]

Yoga is the science of right living and, as such, is intended to be incorporated in daily life. The word yoga means 'unity' or 'oneness' and is derived from the Sanskrit word 'yui' which means to direct and concentrate one's attention on, to use and apply. This unity or joining is described in Spiritual terms as the union of the individual consciousness with the universal consciousness. On a more practical level, yoga is a means of balancing and harmonising the body, mind and emotions.[5] Yoga as an art helps in enhancing the well being of individuals. Considering the immense benefits of yoga practice, the influence of yoga on the learning abilities in disabled children is worth exploring. A positive and desirable benefit in practicing yoga would go a long way in bring about affordable, non invasive and effective solutions to learning disabilities.

Objectives

This study was carried out

- To screen the attention deficit and concentration problems among children with learning disabilities.
- To evaluate the effect of yoga therapy to improve attention and concentration in modified environment.
- To evaluate the effect of yoga therapy to improve attention and concentration without changing the environment

Methodology

Study setting and study participants

This study was carried out as a quasi experimental study among school children with learning disability for a period of six months. Children between 12 and 14 years with learning disability were included in the study. Children with normal Intelligence Quotient (IQ) level and physical handicap were excluded from the study.

Sample size and sampling technique

The study was carried out in one special school for disabled children. All the children with attention and concentration difficulties were selected for the study. A total of 43 participants were selected and were assigned to two groups by purposive sampling given in Table 1:

Table-1: Participant allocation method:

S. No	Group	Description	Number of participants
1	Experimental	Yoga training was given in the normal	19

	group I	environment	
2	Experimental group II	Yoga training given in a modified environment	24

Ethical approval and informed consent

Approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Appropriate written permissions were obtained from the school authorities prior to the commencement of data collection. Each parent/ guardian was explained in detail about the study and informed consent was obtained from the parents and the participants prior to the data collection.

Data collection tools:

Intervention programme

The intervention programme consisted of yoga therapy. This therapy consisted of sectional breathing, *Suriya Namashkar, Asanas, Pranayama, Dhayana* and *Yoga Nidhra*. This training was provided in 15 sessions over three weeks. Each session lasted for an hour and thirty minutes consisting of yoga training, practice, relaxation and clarification of doubts related to the sessions.

Environmental modification

Evaluation of the outcome

Letter cancellation test (1&2) and digit span test (Wechsler intelligence test) were used to measure the level of attention problem and to measure the level of concentration. Each test was administered twice for each participant- once before the commencement of the study and after the entire duration of intervention was complete.

Data analysis

Data was entered and analyzed using SPSS version 20 software. The outcomes were expressed as mean scores. Paired sample t test was used to compare the outcomes between pre and post intervention. A P value <0.05 was considered statistically significant.

Results

This quasi experimental study was carried out among 55 children with learning disability. The gender wise comparison of the outcomes is given in table 1. There was no statistically significant difference between boys and girls with respect to the learning disability.

Table1 – Gender wise comparison of learning disabilities:

S. No	Test	Group	N	M.D	S.E	't'-value
1	Letter cancellation test 1	Boys Girls	39 16	1.03	1.41	0.732(N.S)
2	Letter cancellation test 2	Boys Girls	39 16	1.87	2.19	0.0850 (N.S)
3	Digit span test	Boys Girls	39 16	1.09	1.05	1.037(N.S)

NS- Not Significant

Our study compared the pre and post experimental scores of letter cancellation test and digit span test for the experimental group I using a paired t test. We observed a statistically significant difference between the mean scores of pre and post experimental values for all the tests ($p<0.05$). (Table 2)

Table 2 – Paired t test results for experimental group I:

S. No	Test	Group	N	M.D	S.E	't'-value	p value
1	Letter cancellation test 1	PRE POST	19 19	1.89	0.25	7.507**(0.01)	0.01
2	Letter cancellation test 2	PRE POST	19 19	2.37	1.11	2.13**(0.05)	0.05
3	Digit span test	PRE POST	19 19	2.11	0.45	4.68**(0.01)	0.01

**Significant 0.01 level, *Significant 0.05 level, **Significant 0.01 level

Our study compared the pre and post experimental scores of letter cancellation test and digit span test for the experimental group II using a paired t test. We observed a statistically significant difference between the mean scores of pre and post experimental values for all the tests ($P<0.05$).(Table 3)

Table 3: Comparison between pre and post test values for experimental group II

S. No	Test	Group	N	M.D	S.E	't'-value	P value
1	Letter cancellation test 1	PRE POST	19 19	1.89	0.25	7.507**(0.01)	0.01

2	Letter cancellation test 2	PRE POST	19 19	2.37	1.11	2.13** (0.05)	0.05
3	Digit span test	PRE POST	19 19	2.11	0.45	4.68** (0.01)	0.01

The Independent sample t test was done to compare the post test scores between experimental group I and II. We found statistically significant difference between the two groups for all the tests ($P<0.05$)

Table 4: Independent sample t test comparing both the experimental groups

S. No	Test	Mean difference	Standard Error	t value	p value
1	**Letter cancellation test 1**	**3.96**	**1.4**	**2.82**	**<0.05**
2	**Letter cancellation test 2**	**4.14**	**1.67**	**2.47**	**<0.05**
3	**Digit span test**	**2.36**	**0.89**	**2.65**	**<0.05**

Discussion

There is a significant influence of environment on the learning abilities for all individuals. In fact, the importance of the work environment is so obvious, modern workplace designers have been quite successful in manipulating many of the relevant dimensions, most of us expect to work in an environment that is well lit, not too warm, not too cold, and free from physically damaging noise levels. Noise, music, lighting, furniture and layout, classroom environments, density, word display, plays major role in the environments while practicing yoga.

Some of the key aspects of environment which influence yoga include music, lighting, furniture layout and classroom environment. Pleasant music will make trainees cheerful and the environment enjoyable. In yoga center, music may facilitate vigilance tasks, although it can be distracting for some. At any rate, trainees often report that music helps provide a pleasant atmosphere, which may ensure that it will always be found in some settings. At very basic level, lighting affects performance by making it harder or easier to see what we are doing. At one extreme, the absence of light makes it impossible to do yoga because we cannot know that we are doing, the other hand, we may not feel comfortable to perform yoga, if there is too much light. Pleasant lighting will help to create the mood to perform the yoga practice.

Decorated spaces makes people feel more comfortable than to undecorated spaces and that good moods associated with pleasant environments seem to increases people's willingness to help each other. Changes in classroom environments have been made more or less continuously since we abandoned the one room schoolhouse. However, as we shall see, we are not longer bound to traditional design for physical reasons, and that changes in classroom design can result in more positive student attitudes and greater participation in class. Climatic conditions also play a key influence in the learning abilities. Studies have shown that the existence of a systematic seasonal variation with more stress hormones in summer than in winter. The children situated in the one classroom lacking both natural daylight and fluorescent daylight tubes demonstrated a marked deviation from this pattern. High levels of morning cortisol were associated with sociability, while moderate or low levels seemed to promote individual concentration. Annual body growth was smallest for the children with the highest levels of morning cortisol. Possibly, the production of cortisol had some influence on sick leave. It may be concluded, that windowless classrooms should be avoided for permanent use.[6]

Whether the classroom is open or closed, windowless or windowed, or complex or simple, educators, parents, and students are concerned about the number of students in the class, or in the term more familiar to environmental psychologists, the density in the classroom. In general high density has minimal effects on learning of simple concepts appropriate to a lecture format, but interferes with activities that require students to interact. Photographs, if possible should be taken of students performing the asana. This should be displayed at the center, the joy and pride of seeing the displayed photographs act as reinforcement. Closed atmosphere will help to avoid the external distraction and its helps to improve the concentration by focusing our mind. Above all,

if the number of teachers is more, the students get more individual attention and its helps to avoid certain behavior like touching, pushing, kicking and etc.

Yoga for learning disabled children

Yoga in general means:

- Bringing two things together, to meet, to unite
- Causing the movements of the mind to come together
- Enabling one achieve his fullest capacities.

Yoga when applied:

- To arrive certain level where the activities of the mind and body work as one.
- To avoid distraction and to help one focus all his attention on the activity in which he/she is presently involved.
- To advance towards achieving higher levels of performance, those presently exist only as capabilities within the individual, which have not yet come out.

Yoga for learning disabled children:

- Should help co-ordination the activities of the mind and body.
- Should tend to reduce the distracted state of mind, helping the mind concentrate on the present activity.
- Should help improve his activities of daily living to a degree, which could not be achieved before.

Michael Linden, Thomas Habib and Vesna Radojevic et al (2001) contact the research with ADD/ADHD and LD of 18 children with the age group of 5 to 15 were randomly assigned. The duration of the experiment was six months and practice of 40 45-minute sessions of training in augmenting beta activity and decreasing theta activity. Received no EEG bio-feed back. No other psychological treatment or medication was given to any subjects.the subjects were monitored at pre and post treatment on an IQ test and parent behavior rating scales for inattention, hyperactivity, and aggressive/defiant behaviors. The significant improvements in intellectual functioning and attentive behaviors might be explained as a result of the attention enhancement affected by EEG biofeedback training. **[7]**

Kari Kassir, M.D. and et al (Jan 2008) conducted the research with Autistic Spectrum children and he found the practice of Asana (posture), Pranayama and Meditation, is used with children on the autistic spectrum. Although no evidence-based studies have been published, yoga

has been utilized successfully in a number of venues to facilitate relaxation and bring about improvement in symptoms. **[8]**

Conclusion:

The following conclusion were drawn

1. There is a no significant difference between boys and girls on letter cancellation test (1), (2) and digit span test.
2. There is a significant difference between pre and post experimental group (I) on letter cancellation test (1), (2) and digit span test.
3. There is a significant difference between pre and post experimental group (II) on letter cancellation test (1), (2) and digit span test.
4. There is a no significant difference between pre and post control group on letter cancellation test (1), (2) and digit span test.

Limitation: The studies find very difficult to select the sample, because the study is only for learning disabled children.

Implication: Studies can be conducted in concentrating any one topic (like relaxation, meditation or pranayama) and to identify, which is very effective for improve the attention for learning disabled children.

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