



## Research Article

www.ijrap.net



### FEASIBILITY OF PARENT-BASED YOGA INTERVENTION FOR GROUP OF AUTISM SPECTRUM DISORDER CHILDREN IN SPECIAL SCHOOLS: A PILOT STUDY

Kumar Narasingharao <sup>1\*</sup>, Balaram Pradhan <sup>2</sup>, Janardhana Navaneetham <sup>3</sup>

<sup>1</sup>Ph.D (Yoga) Research Scholar, Department of Yoga and Humanities, S-VYASA Yoga University, Jigani, Bengaluru, India

<sup>2</sup>Assistant Professor, Department of Academic, S-VYASA Yoga University, Jigani, Bengaluru, India

<sup>3</sup>Associate Professor, Department of Psychiatric Social work, NIMHANS, Bengaluru, India

Received on: 20/02/17 Revised on: 20/03/17 Accepted on: 27/03/17

#### \*Corresponding author

E-mail: nknrao2007@gmail.com

DOI: 10.7897/2277-4343.08263

#### ABSTRACT

Autism Spectrum Disorder (ASD) is a debilitating developmental disorder. Apart from behavior problems like communication and interaction, attention deficit, social behavior, adhering to sameness and repeated behavior, sensory integration, motor problems ASD children also suffer from a sleep disorder, gastrointestinal problem. Yoga is a non-invasive and alternative therapy which brings positive changes at both physiological and psychological level. We conducted this pilot study to test the feasibility of parent based structured yoga intervention for a large group of ASD children in special schools to reduce the severity of sleep, gastrointestinal and behavior problems. This was a pre-test and post-test single group design. A group of 7 ASD children between 5 and 16 years' age group, comprising 4 males and 3 females were selected from ATG (Assessment, Training, and Guidance) center. A set of 61 questionnaires were used to collect data from parents' pre and post yoga intervention. Two weeks' yoga intervention was given for 75 minutes everyday evening along with parents. As per the feedback from parent's significant changes have been seen among children in sleep and gastrointestinal problems in early days. It was concluded that with a longer period of intervention significant changes can be found with structured yoga intervention for a large group of ASD children involving parents in special schools. As per the parent's suggestion, teachers' involvement in such intervention will help to discipline the children during the intervention.

**Keywords:** ASD, sleep, gastrointestinal, behavior, physiological, psychological.

#### INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder highly prevalent among the children, all over the world<sup>1</sup>. Recent studies have shown that apart from behavior problem ASD children also suffer from a sleep disorder, gastrointestinal problems<sup>2</sup>. ASD children suffer from social communication and interaction, restricted and repeated behavior, lack of eye to eye contact, attention deficit, sensory integration, motor problems and cognitive problems<sup>3,4</sup>. Anxiety and poor stress management are some of the common concerns of children with ASD<sup>5</sup>. The prevalence rate of autism is 1 in every 68 children in the USA according to Centre for Disease Control<sup>6</sup>. The prevalence rate in India is estimated to be 2.3 million<sup>7</sup>. Up to 80% of ASD children suffer from a sleep disorder<sup>8,9</sup>. The sleep problems exacerbate symptoms of autism if not detected early and given proper intervention by qualified professionals<sup>10,11</sup>. The gastrointestinal problem is the other medical condition requires immediate attention which leads to many digestion related problems<sup>12,13</sup>. GI problems and associated symptoms are very common among ASD children may be associated with compositional changes in intestinal bacteria<sup>14,15,16</sup>. Instead of relying on parents experts in this area need to understand the whole issue related to GID of ASD children adopt proper intervention method<sup>17</sup>. We hypothesize that parent based yoga intervention effectively helps in reducing the problems of sleep, gastrointestinal and behavior problems. Yoga improves sensory integration and control behavior problems among ASD children<sup>18,19</sup>. Yoga is a one of the alternative therapy without any side effects to treat ASD children. Recent studies have found yoga to be the most effective therapy for mental and neurological disorders<sup>20,21</sup>.

#### MATERIALS AND METHODS

This was a pilot study with pre-test and post-test single group design. A group of 7 children between 5-16 years of age of mean value 11.14 and standard deviation of 3.76 was selected from ATG Centre Bengaluru. We briefed parents and staff of ATG center about the intervention. The intervention was conducted during 2<sup>nd</sup> and 3<sup>rd</sup> week of January 2016. The session was held every evening between 5.45 pm to 7.00 pm for 75 minutes. This project was approved by Institutional Ethics Committee S-VYASA Yoga University, Bengaluru. ATG center records were verified to make sure that children are previously diagnosed as autistic under the International Classification for Diseases 10<sup>th</sup> edition (ICD-10)<sup>22</sup>. We included children whose parents were willing to participate with their children in the intervention. A structured yoga intervention module was prepared by the researcher based on the three problematic areas of ASD children as shown in Table-1. Set of 61 questionnaires developed by the researcher based on sleep, Gastrointestinal and behavior problems of ASD children was use by teachers to collect data pre and post yoga intervention.

**Yoga Intervention:** A Yoga instructor with post graduation in yoga with several years of teaching experience conducted an intervention. Most of the children were physically helped by their parents during the intervention. It was challenging to teach pranayama (regulated breathing) practices to the children. Parents were advised to make children sit in front of the mirror at home and practice breathing practices. After few days of practice, we understood that it was not possible to practice entire yoga module in 75 minutes. It was divided into two group

assigning number 1 and 2. According to the number indicated in the module, asanas(postures) were practiced on alternative days and some asanas(postures) marked both numbers indicating those to be practiced on every day. This was made easy for both

children and parents to practice yoga. We requested parents to practice at home in the mornings whichever asanas (postures) not practiced at the center with their children during the intervention period.

**Table 1: Yoga Program**

S.N	Item	Time
	Starting prayer	
1	Breathing Exercises	2 Min
2	Preparatory/Dynamic Practice	8 Min
3	Wind Releasing Practices (Pavana Mukthasana)	7 Min
4	Sun Salutation (Surya Namaskara)	6 Min
	Relaxation	1 Min
5	Standing asana (postures)	8 Min
6	Sitting asana (postures)	11 Min
7	Prone Posture	2 Min
8	Supine Posture	5 Min
9	Pranayama (Regulated Breathing Practices)	8 Min
	Relaxation	8 Min
10	Chanting Slokā (Mantras)	9 Min
	Ending Prayer	

**RESULT**

**Statistical analysis**

SPSS-21 software was used to find the statistical analysis of post-yoga intervention results. We made descriptive analysis to pre and post data after two weeks yoga intervention. Since the sample size was small and considering data not normally distributed, we conducted Wilcoxon test to find the significance.

We observed improvement in some areas of the problems of the children when compared post-test data with a pre-test. After analysis means value showing less in posttest data compared to pretest data in sleep questionnaires in Table 2. SQ-1, SQ-2, SQ-3, SQ-4, SQ-6, SQ-9, SQ-10, and SQ-12 are showing moderate significant indicating that problems related to these questionnaires are shown improvements. SQ-5, SQ-7, SQ-11, SQ-13, SQ-14 and SQ-15 are showing less significance.

**Table 2: Sleep Questionnaires**

Statement	Pre Values		Final Values		Z Score	Asymp. Sig (2-tailed)	95% Confidence Interval of the Difference	
	Mean	± Std. Deviation	Mean	±Std. Deviation			Lower	Upper
SQ-1	3.29	1.113	1.71	1.496	-1.823 <sup>b</sup>	.068	-.188	3.331
SQ-2	3.00	1.291	1.43	.787	-2.060 <sup>b</sup>	.039	.279	2.864
SQ-3	4.29	.951	3.29	1.254	-2.333 <sup>b</sup>	.020	.466	1.534
SQ-4	4.43	.535	3.43	1.272	-1.841 <sup>b</sup>	.066	-.068	2.068
SQ-5	4.86	.378	3.57	1.618	-1.625 <sup>b</sup>	.104	-.379	2.950
SQ-6	4.29	1.113	3.14	1.069	-2.060 <sup>b</sup>	.039	.154	2.132
SQ-7	3.71	1.254	2.71	1.890	-1.242 <sup>b</sup>	.214	-.771	2.771
SQ-8	2.86	1.345	3.57	1.813	-.750 <sup>c</sup>	.453	-2.962	1.533
SQ-9	2.71	1.604	1.00	0.000	-2.041 <sup>b</sup>	.041	.231	3.197
SQ-10	3.86	1.069	2.14	1.215	-1.903 <sup>b</sup>	.057	-.034	3.462
SQ-11	3.43	1.272	2.71	1.113	-1.186 <sup>b</sup>	.236	-.669	2.098
SQ-12	4.14	.900	2.29	1.604	-1.897 <sup>b</sup>	.058	.052	3.662
SQ-13	4.14	.690	3.43	1.397	-.962 <sup>b</sup>	.336	-.950	2.379
SQ-14	4.29	1.496	3.29	1.604	-1.518 <sup>b</sup>	.129	-.413	2.413
SQ-15	1.71	1.113	1.29	.488	.129	.257	-.474	1.331

SQ=SLEEP QUESTIONNAIRE.  
a. Wilcoxon Signed Ranks Test  
b. Based on positive ranks.  
c. Based on negative ranks d. The sum of negative ranks equals the sum of positive ranks.

In food and digestion questions there are 16 questions as mentioned in Table 3. These are all mostly physiological problems and by practicing yoga we can see changes in post-intervention. Questions FQ-4, FQ-5, FQ-6, FQ-9, FQ-10 to FQ-15 showing some significance. Questions FQ-1, FQ-2, FQ-3, FQ-7, FQ-8, and FQ-16 less significance observed compared to

other questions. Changes have occurred even in a small period of intervention in these areas of problems. Mean values also less in post-intervention compared to pre values considering feedback from parents they have seen some changes in problems.

**Table 3: Food and Digestion Questionnaires**

Statement	Pre Values		Final Values		Z Score	Asymp. Sig (2-tailed)	95% Confidence Interval of the Difference	
	Mean	± Std. Deviation	Mean	±Std. Deviation			Lower	Upper
FQ-1	3.14	.900	2.43	1.512	-1.089 <sup>b</sup>	.276	-.769	2.197
FQ-2	3.14	1.215	2.43	1.512	-1.089 <sup>b</sup>	.276	-1.113	2.542
FQ-3	3.00	1.291	2.14	1.345	-1.196 <sup>b</sup>	.232	-1.100	2.814
FQ-4	4.57	.535	2.00	1.732	-2.070 <sup>b</sup>	.038	.895	4.248
FQ-5	4.57	.535	2.29	1.890	-2.041 <sup>b</sup>	.041	.709	3.862
FQ-6	4.43	1.512	1.43	1.134	-2.333 <sup>b</sup>	.020	1.398	4.602
FQ-7	3.86	.378	2.86	1.464	-1.473 <sup>b</sup>	.141	-.510	2.510
FQ-8	2.43	1.134	2.29	1.254	-.276 <sup>b</sup>	.783	-1.101	1.387
FQ-9	4.86	.378	3.57	1.272	-2.060 <sup>b</sup>	.039	.009	2.562
FQ-10	3.57	1.272	2.43	1.618	-1.841 <sup>b</sup>	.066	.019	2.267
FQ-11	3.29	1.254	2.43	1.512	-1.656 <sup>b</sup>	.098	-.267	1.981
FQ-12	3.43	1.272	1.71	1.113	-2.070 <sup>b</sup>	.038	.555	2.874
FQ-13	2.86	1.773	1.29	.488	-2.032 <sup>b</sup>	.042	.173	2.970
FQ-14	3.00	1.414	1.43	1.134	-2.232 <sup>b</sup>	.026	.523	2.620
FQ-15	2.86	1.069	1.29	.488	-2.121 <sup>b</sup>	.034	.523	2.620
FQ-16	3.00	1.915	2.00	1.732	-1.342 <sup>b</sup>	.180	-.602	2.602

SQ=SLEEP QUESTIONNAIRE.  
a. Wilcoxon Signed Ranks Test  
b. Based on positive ranks.  
c. Based on negative ranks  
d. The sum of negative ranks equals the sum of positive ranks.

**Table 4: Behaviour Questionnaires**

Statement	Pre Values		Final Values		Z Score	Asymp. Sig (2-tailed)	95% Confidence Interval of the Difference	
	Mean	± Std. Deviation	Mean	±Std. Deviation			Lower	Upper
BQ-1	4.71	.488	3.14	1.574	-2.032 <sup>b</sup>	.042	.173	2.970
BQ-2	4.29	1.496	2.43	1.512	-1.706 <sup>b</sup>	.088	-.496	4.211
BQ-3	4.43	.535	2.71	1.604	-2.058 <sup>b</sup>	.040	.331	3.098
BQ-4	3.71	1.380	3.71	1.496	.000 <sup>c</sup>	1.000	-1.308	1.308
BQ-5	4.29	.756	3.14	1.345	-1.994 <sup>b</sup>	.046	.154	2.132
BQ-6	4.14	.690	3.29	1.254	-1.511 <sup>b</sup>	.131	-.387	2.101
BQ-7	4.71	.488	3.86	.900	-1.890 <sup>b</sup>	.059	-.132	1.846
BQ-8	4.29	.951	4.14	.378	-.333 <sup>b</sup>	.739	-.981	1.267
BQ-9	3.86	.690	3.29	1.254	-1.242 <sup>b</sup>	.214	-.721	1.864
BQ-10	4.29	1.496	2.57	1.718	-1.807 <sup>b</sup>	.071	-.113	3.542
BQ-11	2.86	1.464	1.29	.488	-2.041 <sup>b</sup>	.041	.395	2.748
BQ-12	4.14	.378	3.57	1.272	-1.342 <sup>b</sup>	.180	-.477	1.620
BQ-13	3.14	1.574	2.14	1.069	-1.838 <sup>b</sup>	.066	-.194	2.194
BQ-14	3.71	.756	3.14	1.464	-.649 <sup>b</sup>	.516	-1.105	2.248
BQ-15	4.57	.787	3.86	1.069	-1.186 <sup>b</sup>	.236	-.669	2.098
BQ-16	4.29	1.496	3.29	1.704	-1.633 <sup>b</sup>	.102	-.194	2.194
BQ-17	4.29	.488	4.00	0.000	-1.414 <sup>b</sup>	.157	-.166	.737
BQ-18	4.00	.577	3.57	.787	-.816 <sup>b</sup>	.414	-.748	1.605
BQ-19	3.14	1.345	3.00	1.000	-.447 <sup>b</sup>	.655	-.689	.975
BQ-20	3.43	1.272	2.71	1.380	-1.633 <sup>b</sup>	.102	-.315	1.743
BQ-21	4.43	1.512	3.00	1.414	-2.264 <sup>b</sup>	.024	.252	2.605
BQ-22	4.43	.787	2.86	1.464	-2.232 <sup>b</sup>	.026	.395	2.748
BQ-23	4.00	.816	2.86	.690	-2.000 <sup>b</sup>	.046	.154	2.132
BQ-24	4.57	.787	3.57	.976	-1.552 <sup>b</sup>	.121	-.413	2.413
BQ-25	3.14	1.773	3.43	1.272	-.318 <sup>d</sup>	.750	-2.596	2.024
BQ-26	2.29	1.890	3.00	1.915	-.531 <sup>d</sup>	.595	-3.525	2.097
BQ-27	5.00	0.000	3.29	1.496	-2.032 <sup>b</sup>	.042	.331	3.098
BQ-28	3.86	1.464	2.00	.577	-2.242 <sup>b</sup>	.025	.613	3.101
BQ-29	1.43	1.134	1.57	1.512	-.447 <sup>d</sup>	.655	-2.025	1.740
BQ-30	4.57	.535	3.71	.951	-2.121 <sup>b</sup>	.034	.219	1.495

BQ=BEHAVIOUR QUESTIONNAIRE  
a. Wilcoxon Signed Ranks Test  
b. Based on positive ranks.  
c. Based on negative ranks  
d. The sum of negative ranks equals the sum of positive ranks.

In Table 3 related to behavior problems numbering 30 are shown. In behavior questionnaires BQ-1, BQ-2, BQ-3, BQ-5, BQ-7, BQ-10, BQ-11, BQ-13, BQ-21, BQ-22, BQ-23, BQ-27, BQ-28, and BQ-31 have shown more significance compared to other behavior problems which have shown significance. We can see mean values reduced in post data indication improvements.

## DISCUSSION

Earlier studies have shown improvements in eye to eye, sitting tolerance, communication skills, body posture and awareness, receptive skills and self-stimulatory behavior etc. of ASD children after a longer period of intervention<sup>23</sup>. In this study, due to a short period, not many changes were seen in behavior problems though the severities changed from higher level of problem to lower level. In one of the studies involving yoga as integrated movement therapy encouraging results have found in physical stimulation, social interaction, language stimulation, self-calming etc.<sup>24</sup>

In this study, according to parent's feedback children have calmed down and trying to say words during sloka chanting and little improvement in observing things and responding when called by name, imitating actions by others etc. Yoga improves functioning among ASD children with yoga interventions controlling anxiety and depression, aggression attention problems, withdrawal symptoms and repletion behaviors as per the previous pilot study<sup>25</sup>.

Sun salutations increase the ability to focusing on tasks and mind-body coordination also reduces anxiety and calm down mind. After intervention parents are happy that children are calm and restlessness has come down compared to pre-intervention. Shavasana (relaxation in dead body posture) also gives meditative effect on the mind of ASD children. Initially, it was difficult to make children go to this asana. Parents have to hold children physically in the position and kept handkerchief to keep the eyes closed. After 4-5 days' it was nice to see children adopting Shavasana (relaxation in dead body posture) on their own. Yoga also improves sensory integration ability and motor movements, mind-body coordination and cognitive ability. But this study held for short period we have not seen any significant about these symptoms. After the intervention of two weeks we saw more changes in physiological problems but changes at the mental level it requires a longer period of intervention as.

With this pilot study, we collected some useful inputs for our main study planned for a large group of ASD children. It was concluded that parental based yoga intervention can be conducted for a large group of ASD children. Teacher's involvement in such studies will have discipline children during the intervention. We need to conduct yoga intervention for a longer period to see significant changes.

This was a single group study with small sample size without a control group. For data collection, we have to totally depend on parents and teachers. The study conducted for short period hence not many changes seen in behavior problems.

## ACKNOWLEDGMENTS

Authors are grateful to ATG center of ASHA Charitable trust and its staff. We are grateful to Mrs. Jayashree Ramesh, for extending full support for this study. Our sincere thanks for children and parents who volunteered to participate in this study.

## REFERENCES

1. Karande S. Practitioner section autism: A review for family physicians. *Indian J Med Sci.* 2006;60(5). Downloaded from <http://www.indianjmedsci.org> on Tuesday, November 24, 2015, IP: 101.222.171.244] 20
2. Kumar N, Pradhan Balam, Janardhan N. Sleep Disorder, Gastrointestinal Problems and Behaviour Problems Seen in Autism Spectrum Disorder Children and Yoga as Therapy: A Descriptive Review. *J Clin Diagn Res.* 2016;13-15.
3. American Psychological Association. Diagnostic and statistical Manual of mental disorders-DSM-IV. May-1994, p-1-875
4. Samy KL, Osman DM, Selim MH, Mohamed RA. Communication skills, sensory integration functions, and auditory brainstem response: findings in a group of Egyptian children with autistic features. *Egyptian Journal Otolaryngol.* 2012;28,117-26.
5. Susan E. Levy, Susan L. Hyman. Complementary and Alternative Medicine Treatments for Children with Autism Spectrum Disorders; *Child Adolesc Psychiatr Clin N Am.* 2008;17.4.1-15
6. A Christensen DL, Baio J, Van Naarden Braun K, et al. CDC 2012. Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years; 2016; 65(No. SS-3): 1 -23. [www.cdc.gov/mmwr](http://www.cdc.gov/mmwr)
7. Monica Juneja, Sharmila Banerjee Mukherjee, Suvasini Sharma, Rahul Jain, Biswajit Das, Philomena Sabu; Evaluation of a parent-based behavioral intervention program for children with autism in a low-resource setting; *Journal of Pediatric Neurosciences;* 2012;7:24-26.
8. Simonne Cohen1\*, Russell Conduit2, Steven W Lockley1,3,4, Shantha MW Rajaratnam1,3,4 and Kim M Cornish. The relationship between sleep and behavior in autism spectrum disorder ( ASD ): a review. *J Neurodev Disord.* 2014;
9. Beth A. Malow, Mary L. Marzec Susan G. McGrew, Lily Wang, Lynnette M. Henderson, Wendy L. Stone. Characterizing Sleep in Children with Autism Spectrum Disorders: A Multidimensional Approach. *Sleep;* 2006;29;12; 1563-1571
10. Schreck KA, Mulick JA, Smith AF. Sleep problems as possible predictors of intensified symptoms of autism \$. *Res Dev Disabil.* 2004;25:57-66.
11. Brown J, Herrick SE, Luskin B, Cardwell E, Brown H, Brown J, et al. Autism Spectrum Disorder and Sleep-Related Disturbances: A General Overview. *Behavioral Health.* 2013;3.1-11.
12. Mouridsen SE, Rich B. Diseases of the gastrointestinal tract in individuals diagnosed as children with atypical autism : A Danish register study based on hospital diagnoses. *Autism.* 2012;17(1):55-63.
13. Phillip Gorrindo, Kent C. Williams, Evon B. Lee, C, Lynn S. Walker, Susan G. McGrew, Pat Levitt Gastrointestinal Dysfunction in Autism: Parental Report, Clinical Evaluation, & Associated Factors. *AUTISM Res.* 2013;5(2):101-108.
14. Brent L. Williams, Mady Hornig, Tanmay Parekh, and W. Ian Lipkin Center. Application of Novel PCR-Based Methods for Detection, Quantitation, and Phylogenetic Characterization of Sutterella Species in Intestinal Biopsy Samples from Children with Autism and Gastrointestinal Disturbances. *mBio.* 2012;3(1):1-11
15. Buie Timothy, Campbell Daniel B, George J Fuchs, GlennT Furuta, Joseph Levy, Judy Van de Water et.al. Evaluation, Diagnosis, and Treatment of Gastrointestinal Disorders in Individuals With ASDs: A Consensus Report. *Pediatrics.* 2010;125. S1-S8
16. Barbara O McElhanon, Courtney McCracken, Saul Karpen,

- William G Sharp. Gastrointestinal Symptoms in Autism Spectrum Disorder: A Meta-analysis. *Pediatrics*. 2014; 133:5
17. Phillip Gorrindo, BSA, Kent C. Williams, MDB, Evon B. Lee, PhD, C, Lynn S. Walker P, Susan G. McGrew, MDB, and Pat Levitt P. Gastrointestinal Dysfunction in Autism: Parental Report, Clinical Evaluation, & Associated Factors. *AUTISM Res*. 2013;5(2):101–108.
  18. Studnitzer A, Studnitzer A, Ed D, Miller A, Ed D. Yoga : Therapy for Children on the Autism Spectrum. *Acad Exch Q*. 2014;18(2).
  19. Porter J. Yoga as an Effective Behavioral Intervention for Children Diagnosed with an Autism Spectrum Disorder. *Grad Annu*. 2013;1.
  20. M. S. Keshavan, N. P. Rao, Rao T. S; Yoga and mental health : the Promising road ahead, but proceed with caution. *Indian J Psychiatry*. 2013;55:329-331
  21. Satishchandra P. Yoga and Neurobehavioral Sciences : Indian Perspective. *Indian J Psychiatry*. 2015;55:332–333.
  22. World Health Organization. The ICD-10 Classification of Mental and Behavioural Disorders Diagnostic criteria for research. WHO. 1993;
  23. Shantha Radhakrishna, Raghuram Nagarathna, H. R. Nagendra. Integrated approach to yoga therapy and autism spectrum disorders. *J Ayurveda Integr Med*. 2010;1(2):120–4.
  24. Kenny M. Integrated Movement Therapy TM : Yoga-Based Therapy as a Viable and Effective Intervention for Autism Spectrum and Related Disorders. *International journal of yoga therapy*; 2002;12(12):71–9.
  25. Rosenblatt Lucy E, Gorantla Sasikanth, Torres Jodi A, Yarmush Rubin S, Rao Surita Park Elyse R et al. Relaxation Response–Based Yoga Improves Functioning in Young Children with Autism: A Pilot Study: *The journal of alternative and complementary medicine*;2011;17(11):1029–1035.

**Cite this article as:**

Kumar Narasingharao *et al*. Feasibility of parent-based yoga intervention for group of autism spectrum disorder children in special schools: A pilot study. *Int. J. Res. Ayurveda Pharm*. 2017;8(2):56-60 <http://dx.doi.org/10.7897/2277-4343.08263>

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: IJRAP is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJRAP cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of IJRAP editor or editorial board members.