



Effect of Training in Tabla on the Development of Skills related to Hand Functioning of children with Down syndrome in Primary Group

Behzad Maqbool

Research Scholar, Ramakrishna Mission Vivekananda University & Faculty of Disability Management and Special Education Coimbatore Tamil Nadu, India

Dr. S. Rajaguru

Associate Professor Ramakrishna Mission Vidyalyaya College of Education Coimbatore, India

Abstract

Children diagnosed with Down syndrome are increasingly being given therapeutic approach at least to cover the problems like, minimize stigma and isolation, to promote learning, to provide social competency and personal advocacy. The purpose of this cumulative study was to examine the effect of tabla training on the development of skills related to hand functioning of children with Down syndrome bearing with the age group 6-12 yrs. Seven children were selected with mild and moderate level of retardation from Down syndrome group. Due to non-availability of sample pre post experimental design was selected i.e. all the seven children were selected for intervention i.e. tabla training. The baseline performance level was checked by conducting pre- test with the help of checklist. After giving intervention within twenty sessions more than fifty percent achievement was obtained. Thus the findings revealed that tabla training has great impact on hand functioning skills.

Key words: *Tabla training, hand functioning skills, children with Down syndrome.*

Introduction

Intellectual disability previously called as mental retardation is a generalized disorder appearing before adulthood, characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors. As per the definition given by American Association on Intellectual and Developmental Disabilities (AAIDD) states intellectual disability is a disability characterized by significant limitations both in intellectual functioning and adaptive behavior which covers many every day social and practical skills. This disability originates before the age of 18. The definitions stresses upon intellectual functioning and adaptive behavior. However a better and constructive way to define intellectual disability is in terms of the support needs of the people. Adjusting the environment and the support to meet the person's needs can increase the person's capacity and reduce the effect of the disability.

Among children, the cause is unknown for one-third to one-half of cases Down syndrome, velocariofacial syndrome, and fetal alcohol syndrome are the three most common inborn causes. However, doctors have found many other causes like genetic conditions as Down syndrome, Klinefelter's syndrome, Fragile X syndrome, Neurofibromatosis, congenital hypothyroidism, Williams syndrome, Phenylketonuria (PKU), and Prader-willi syndrome etc. other common causes are pre conception e.g. marriage in relation, prenatal before pregnancy , natal during pregnancy, and post natal after pregnancy.

Down syndrome

Down syndrome is also called as Trisomy 21 the most common cause of mild to moderate mental retardation. The mental retardation physical, medical problems that often come with it .it was named after John Langdon-Down the physician to identify the syndrome (1887).

The cause occurs as the fertilized egg has normally 23 pairs of chromosomes however most of the people who have Down syndrome have an extra copy of chromosome 21 changes the body's and brains normal development.

In most cases Down syndrome is caused by a random error in cell division during formation of mothers eggs and father's sperm of this error when fertilization does take place the embryo has an additional third chromosome 21 or trisomy21. It is not believed that (DS) is result of the parent's behavior or environmental reasons. The risk factors are high in older mothers, marriage after 35 years most chances than younger mothers. The features of Down syndrome children are as follows: Folds on eye lids, Flattened face, Short neck, an upward slant to the eyes, abnormally shaped ears, white spots on the iris of eyes, deep single crease on the palm of hands etc.

Also a blood test can confirm whether the baby has (DS)-chromosomal karyotypes. Down syndrome can't be cured but early treatment can help them to live productive lives well into adulthood. Children with Down syndrome can often benefit from medical treatment, speech therapy, exceptional therapy exercise to help improve their motor skills. They might also be helped by special education with attention at school. Children with Down syndrome mostly face difficulty in (eye hand co-ordination) – they also face the grasping problems, because of the single crease on their palms, and due to their flattened hands they aren't able to hold, close and open their hands firmly. Due to this they remain backward in different areas of their day to day activities like they have low tendency to grasp an object e.g. hold pen pencil books etc. which automatically effect, in their writing, reading and we can say in gross motor and fine motor skills. This is why they show slow development on the other hand they are able to perform skills but in a delayed manner we have to note one point that children with (DS) aren't same they have different rate for growth and development generally the IQ of Down syndrome children lies in between 50-70.

We can't cure the Down syndrome, but through early intervention we can control over it and will prepare the children with Down syndrome to live a happy life. By giving those different types of therapies of training these skills therapies of training will make them able to cope with the normal people. Music therapy is designed to impact the auditory, proprioceptive, and visual sensory systems and can also serve as a motivational tool (Brownell, 2002; Thaut, 1999). According to Griggs-Drane and Wheeler (1997), music therapists use functional behavior assessment procedures to identify individual needs and preferences to develop interventions. These interventions include Using music as a calming medium providing music as a reinforcer and implementing music therapy to teach and encourage communication, behavior, adaptive behavior, and social skills (Brownell, 2000).

American music therapy association in their yearly published journal, music therapy uses music to promote positive changes in the well-being of an individual. The positive change may be manifested in changes in physical, developmental, social, interpersonal, emotional and spiritual well-being or cognitive abilities. Research in neurological functioning supports the association between music and emotion, both of which are processed in the right hemisphere of the brain (Hodges, 1980; Joseph, 1990; Schore, 1994).

Tabla is a type of musical instrument which covers a diversity of areas including gait improvement hand grasp strength, rate of speech and verbal intelligibility, improves motor skills, gross and fine motor skill. As playing tabla requires the rapid movement of arms fingers and good listening etc. it entertains the children and indulges them in the process of learning. It also develops among the children self-esteem, cooperation and co- ordination they learn in play-way manner without stress or strain.

Research studies revealed that impact of music therapy was used in different areas like, to reduce psychological and neurological problems, music therapy for teaching and learning processes, to control intellectual disabilities, to reduce the degree of cerebral palsy among children with (C.P), music therapy for autistic children to enhance language and communication skills and so on. The reviewed literature does not include any such studies conducted before. It is quite known to us that children with Down syndrome love music and rhythm, thus the present study was taken to find out the effect of training in tabla on the Development of Skills related to hand functioning of children with Down syndrome in Primary Group.

Objectives

- To find out the existing level of hand functioning, in different skills of Children with Down-syndrome with the age group 6- 12yrs.
- To find out the effect of training in tabla on the development of skills related to hand functioning of children with Down syndrome 6- 12yrs.

Hypothesis

- There will be a significant difference between pre and post test scores of skills related to hand functioning of children with Down syndrome 6- 12yrs.

Tool

A hand functioning checklist consisting of 30 items was prepared. The items in the checklist were arranged in order consisting of simple to complex activities, related to hand functioning and were appropriate to the particular age group. The checklist was given to ten professionals working in the field of disability and special education, to take their opinion regarding the items for the purpose of validation. The items with 80% approval and above were retained and the remaining were deleted in the final version of the checklist. The performance of the subjects was assessed by rating them with various scores. For example: if the child is able to perform the activity independently, he is rated (+) with 5 points,

Verbal prompt (VP) =04,

Gestural prompt (GP) =03,

Modeling prompt (MP) =2,

Physical prompt (PP) =1.

Sample

The sample of the present study consisted of 7 Down-Syndrome children bearing with the age group of 6-12 years both male and female, selected from the Hyderabad Special School (AP).

Selection of the sample

It was decided to select 16 students for the present study, but due to unavailability of the sample the number was reduced to seven. There was even no school to have such a number of students of Down syndrome bearing this age group. At last seven children with Down syndrome bearing this age group were selected from Hyderabad Special School. Pre-test was conducted using the hand functioning checklist. After pre-test, intervention for 20 sessions was given to sample. The description of the selected sample is given in table below:

Table 1 Age, sex, and level of retardation of students in pre-post experimental group.

S..No.	Pre-post exp. Group	Age	Sex	Level of retardation.
01	S1	6 years	Female	Mild
02	S2	6years	Female	Mild
03	S3	8years	Male	Mild
04	S4	7years	Female	Mild
05	S5	7 years	Male	Moderate
06	S6	6 years	Female	Mild
07	S7	10 years	Female	Moderate

Procedure

The checklist consisting of 22 items was used for pre and post-test examination. The baseline/score of each of the subjects is to be noted in the score column of the checklist.

Design

A pre- post experimental group design was implemented.

Table 2 pre- post experimental group design

Group	Pre-test	Training	Post-Test
Experimental group	Validated Checklist of various motor skills.	Training in tabla for one month with 45 minutes of duration.	Checklist

A pre – post experimental, group design was implemented with no control group. For this pre post experimental group, validated checklist was used for assessment of pre- test scores. The group was given tabla training for the period of one month with 45 minutes of duration. After the completion of this intervention training post-test was conducted to evaluate the progress.

Post-test

Time series was followed and evaluation was done for the every 5th session of intervention using validated checklist. The data obtained was analyzed using matched pair t-test and graphical representations.

Analysis of data:

The data analysis was done using the statistical package for social sciences (spss).The data analysis was done for the achievement scores obtained for hand functioning skills given in the checklist to subjects of pre- post experimental group. The matched pair t- test was done to find whether the difference between pre and post test scores was statically significant or not. The analysis of data is given below in tables and graphs respectively:

Table 3

Table 3 Pre and post- test scores

Group pre-post experimental group.	Test Pre-test.	N 07	Mean 37.4286	SD. 3.99404
Group Pre-post experimental group.	Test Post-test	N 07	Mean 82.8571	SD. 6.41427

From the above table it is seen that the mean achievement score in pre- test of the pre post experimental group is 37.4286 and the standard deviation of this group is 3.99404. The number of sample (N) is seven. It is clear that the mean achievement score in post-test of the pre post experimental group is 82.8571 and the standard deviation of this group is 6.41427. The (N) indicates the number of subjects which is given as seven (7).

Graph showing the average performance of pre -test and post- test scores.

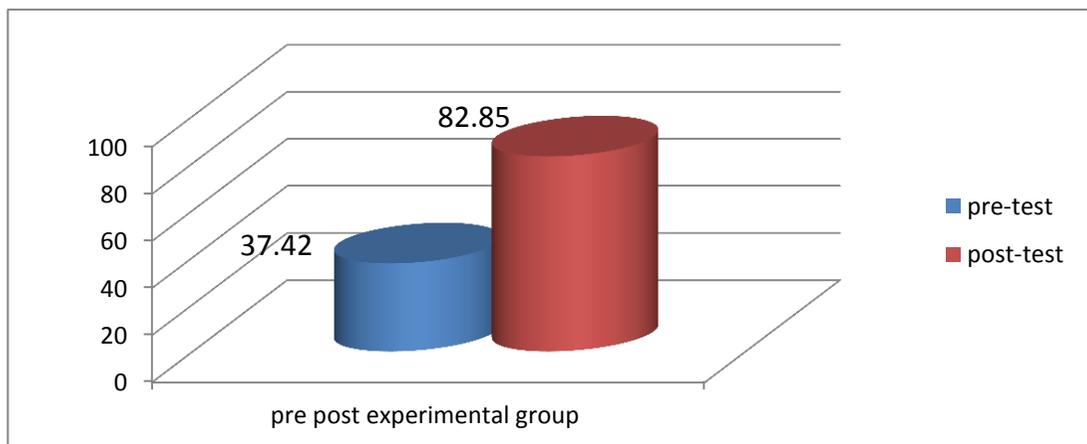


Fig.1 Average performance in pre and post- test scores

The above graph shows the mean achievement scores of pre-test and post-test, here 37.42 represents average score in pre- test and 82.85 represents average score in the post-test. It is evident from the scores that there has been an increase in the post test

scores and this increase is nearly 50%. Therefore it is evident from the scores that the intervention had a remarkable impact on hand functioning.

Table 4 T-test

Mean achievement score and t- value in paired sample test of pre post experimental group.

		Paired differences.					
Paired sample test	N	Mean	S.D.	Std.error Mean.	Int. differences		T value
					Lower	Upper	
Pre-scores and post-scores.	07	-45.4286	8.42332	3.1837	-53.21	-37.63	-14.269 d.f=6 P< .000, HS.

The above table resembles the mean achieved score of pre and post mean scores obtained through paired differences which is given as -42.4286. The standard deviation as 8.42332 and standard error mean as 3.1837 respectively. The interval difference, -53.21 is the lower and -37.63 as upper values respectively. Applying paired t- test to find out significance of the differences between pre and post- test scores. The t-value which is given as -14.269 is highly significant at .000 levels. P<.000(HS) this shows that the training in tabla has a positive effect on the hand functioning skills of the Down syndrome children.

Time series was followed during the intervention and the performance of each subject in every session is shown graphically below.

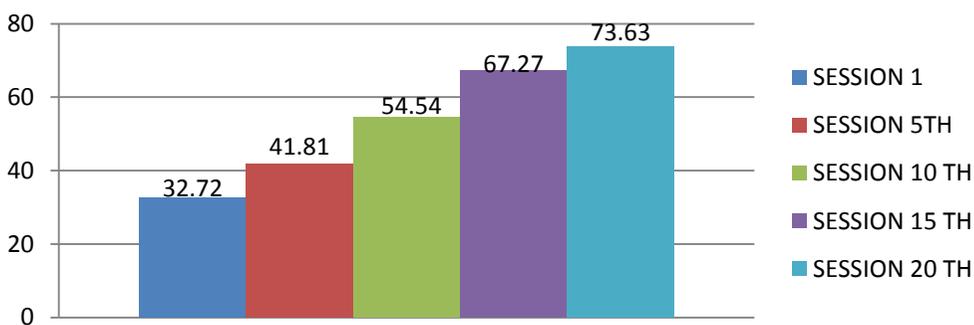


Fig. 2 graph showing time series intervention score of S1.

The above graphical chart shows the session wise performance of scores of the subject S1, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 32.72% age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2= 41.81, S3=54.54, S4=67.27and S5=73.63 respectively. This is evident from the chart that after every session there is a

remarkable change in scores which shows the impact of training on hand functioning in every session.

Subject 2

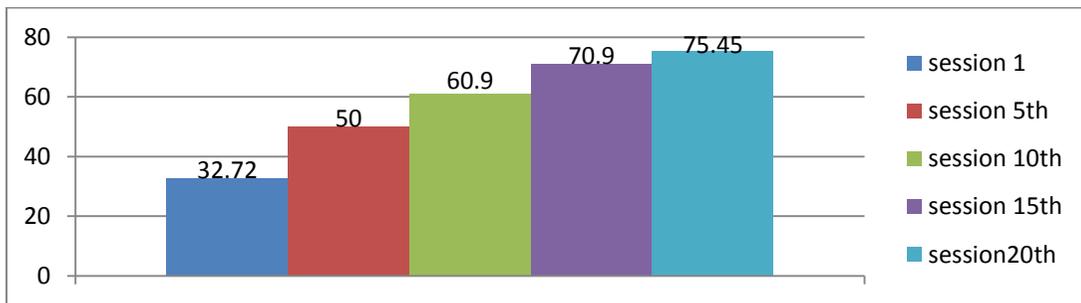


Fig.3 graph showing time series intervention scores of S2.

The above graphical chart shows the session wise performance of scores of the subject S2, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 32.72% age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2= 50.0, S3=60.90, S4=70.90 and S5=75.45 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

Subject 3

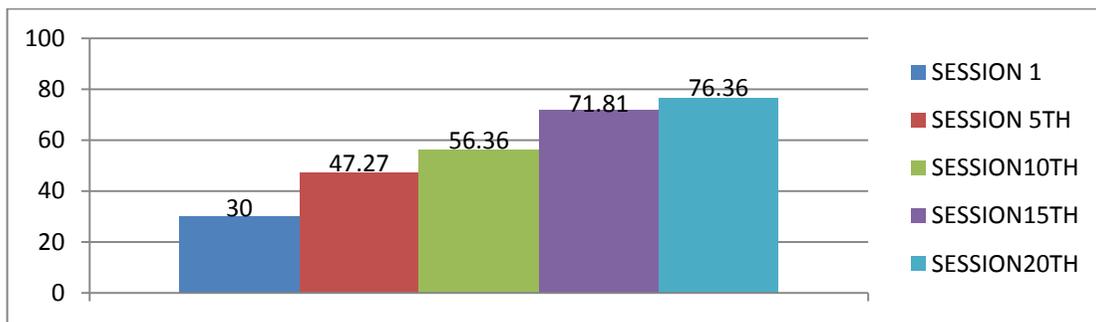


Fig. 4graph showing time series intervention scores of S3.

The above graphical chart shows the session wise performance of scores of the subject S3, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 30.0% age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2= 47.27, S3=56.36, S4=71.81 and S5=76.36 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

Subject 4

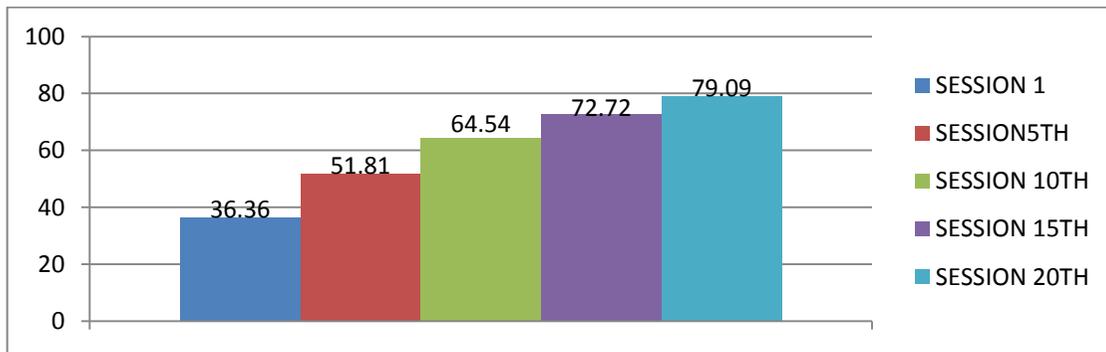


Fig.5 graph shows time series intervention scores of S4.

The above graphical chart shows the session wise performance of scores of the subject S4, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 36.36%age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2 = 51.81, S3 = 64.54, S4 = 72.72 and S5 = 79.09 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

Subject 5

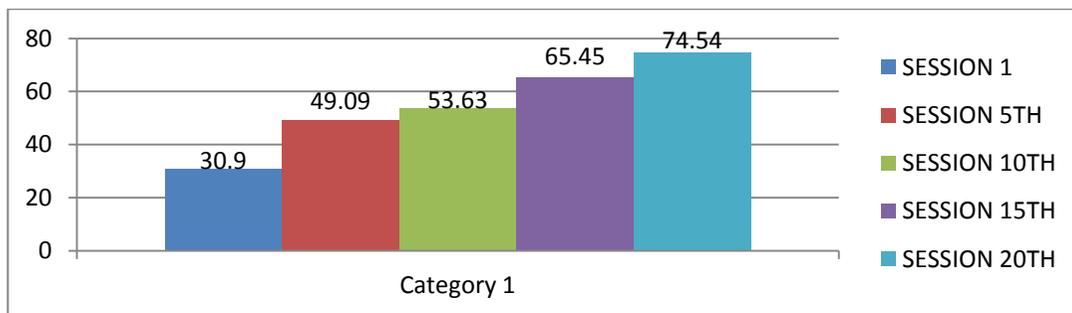


Fig.6 graph shows time series intervention scores of S5.

The above graphical chart shows the session wise performance of scores of the subject S5, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 30.90%age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2=49.09, S3=53.63, S4=65.45 and S5=74.54 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

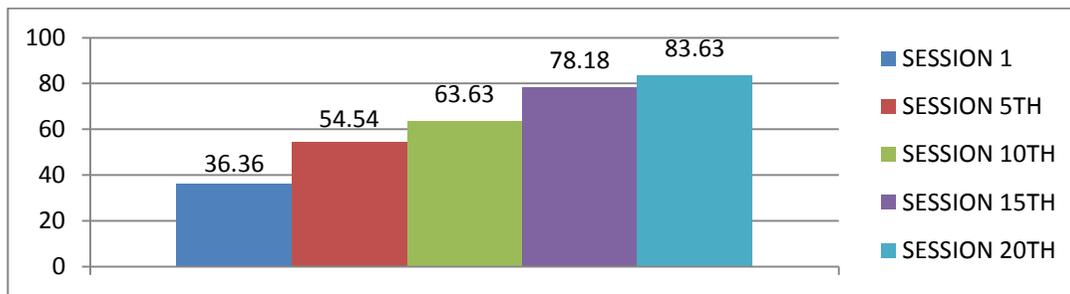
Subject 6

Fig.7 graph shows time series intervention scores of S6.

The above graphical chart shows the session wise performance of scores of the subject S6, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 36.36%age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2=54.54, S3=63.63, S4=78.18 and S5=83.63 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

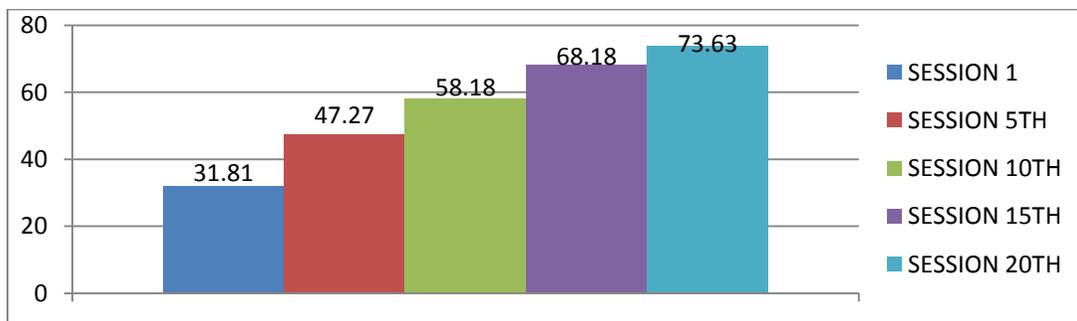
Subject 7

Fig.8 graph showing time series intervention scores of S7

The above graphical chart shows the session wise performance of scores of the subject S7, which is showing increase in the performance in each session. The first session S1 is the pre-test session with 31.81%age. The 5th 10th 15th 20th sessions are the post sessions. Which shows the increase in scores as S2=47.27, S3=58.18, S4=68.18 and S5=73.63 respectively. This is evident from the chart that after every session there is a remarkable change in scores which shows the impact of training on hand functioning in every session.

Discussion

In this present study an attempt was made to find out the effect of training in tabla on the hand functioning and the resulted skill development upon the children with Down syndrome. Children with Down syndrome were selected for this study because they are very keen to music and also they face difficulty in eye hand coordination because of their poor grasp. Seven children having Down syndrome with mild and moderate level

of retardation six to twelve years aged were selected for this study. First of all pre- test was conducted to check the baseline performance of children using checklist. The average pre- test score obtained was 37.42. Intervention was given, and was divided into twenty sessions followed by time series. After completion of the Intervention obtained results indicated a remarkable improvement in hand functioning of the subjects. The average score obtained from post- test was 82.85. Hence there was nearly 50% improvement in the post- test. This improvement was evidenced by checking their performance in different skills given in the checklist. The progress among the subjects achieved was different because of individual difference; however an amazing result was seen in subject S3. The subject was not using his hands because of some fear in the starting sessions. After he was reinforced with video shooting and this reinforcement showed a remarkable success. The overall impact of the training was quite remarkable on hand functioning. The findings are supported by the findings of confrenceco, (1985) described three single case studies. This examined the effects of playing instrument on hand grasp strength and functional task performance. All three cases had left hemiplegia and were right handed. The results showed improvement in left effected hand. So the playing musical instrument has an impact on hand grasp, hand strength, and task performance. Another study by Deutsch and clowell (1999) in a hand book of research on music teaching and learning, described that playing an instrument enhances great attention, learning, gross and fine muscle movements preceding the right motor activity. American music therapy association in their yearly published journal, music therapy uses music to promote positive changes in the well-being of an individual. The positive change may be manifested in changes in physical, developmental, social, interpersonal, emotional and spiritual well-being or cognitive abilities. So there is the great impact of playing musical instrument on motor functioning not merely motor but as well as neurological functioning is enhanced. As revealed by P. webster (2004) striking a drum, clapping, effects on visual, auditory, and kinesthetic movement. Thus in this study the assumed result was obtained with a remarkable improvement which is evidenced by pre and post-test scores. Hence the hypothesis framed was accepted.

Summary and conclusion

The motive of the present study was to investigate the effect of training in tabla on the development of hand functioning skills, which were given in the checklist appropriate to age of the subjects, for children with Down syndrome. In this study pre post experimental design was used. This design was used because the sample size was less due to the shortage of this age group in Down syndrome. Therefore the total numbers of subjects were seven. The subjects were selected in Hyderabad special school in (A.P). All the seven subjects were selected for the training these subjects belonging with the degree of mild and moderate, Down syndrome.

All the seven subjects were assessed under pre-test and then post sessions were started. The subjects were given total number of twenty sessions. The assessment in pre- test was done on the basis of checklist consisting of twenty two items of hand functioning

skills which were appropriate to age and level of the subjects. There was difference in scores among the subjects during the pre- test session.

After the pre- test session, post-test sessions were started on the basis of same checklist. This training was divided into total twenty sessions. After each and every five sessions the evaluation was done. Appropriate material was used in intervention/ training. It was found after each session there was a great improvement in hand functioning and perfection in skills given in the checklist, evidenced by the results in every session. Thus therefore the final results revealed that training in tabla can be effective for children with Down syndrome. It merely not only improved their hand functioning skills but also the academic, social, personal, vocational, domestic skills. The major findings after training were:

- There is a significant difference between pre and post test scores with respect to hand functioning of the sample/ subjects. These findings show that the performance of the students can be improved remarkably by involving them in training musical instruments.
- It was also found, that training in tabla can become an effective strategy in developing hand functioning skills.
- It was also found that tabla training not merely improves only hand functioning but it lays good impact on neurological functioning too which helps the children in acquiring perfection in different domains.
- The results of the present study showed that after each session a great improvement was seen in the hand functioning of the subjects.

References

- 1) American Music Therapy Association (2006). Autism spectrum disorders: *Music therapy research and evidence based practice support*. Retrieved November 1, 2008, from http://www.musictherapy.org/factsheets/bib_autism.
- 2) Bhatara, A. K., Quintin, E. Heaton, P., Fombonne, & Levitin, D. J. (2008). The effect of music on social attribution in adolescents with autism spectrum disorders. *Child Neuropsychology*, 15, 375-396.
- 3) Brownell, M. D. (2002). Music adapted social stories to modify behaviors in students with autism: Four case studies. *Journal of Music Therapy*, 39, 117-124.
- 4) Buday, E. M. (1995). The effects of signed and spoken words taught with music on sign and speech imitation by children with autism. *Journal of Music Therapy*, 32, 189-202.
- 5) Carnahan, C., Musti-Rao, S., & Bailey, J. (2009). Promoting active engagement in small group learning experiences for students with autism and significant learning needs. *Education and Treatment of Children*, 32(1), 37-61.
- 6) Edgerton, C. L. (1994). The effect of improvisational music therapy on the communicative behaviors of autistic children. *Journal of Music Therapy*, 31, 31-62.

- 7) Griggs-Drane, E. R., & Wheeler, J. J. (1997). The use of functional assessment procedures and individualized schedules in the treatment of autism: Recommendations for music therapists. *Music Therapy Perspectives*, 13, 87-93.
- 8) Gunter, P. L., Fox, J. J., McEvoy, M. A., Shores, R. E., & Denny, R. K. (1993). A case study of the reduction of aberrant, repetitive responses of an adolescent with autism. *Education and Treatment of Children*, 16, 187-197.
- 9) Hoffman, J. (1995) Rhythmic medicine: Music with a purpose. Leawood, KS: Jamillan Press.
- 10) Kanner, L. (1943a). Autistic disturbances of affective contact. *Nervous Child*, 2, 217-250.
- 11) Kanner, L. (1943b). Early infantile autism. *Journal of Pediatrics*, 25, 211-217.
- 12) Kern, P., & Alridge, D. (2006). Using embedded music therapy interventions to support outdoor play of young children with autism in an inclusive community-based child care program. *Journal of Music Therapy*, 43(4), 270-292.
- 13) Kim, J., Wigram, T., & Gold, C. (2008). The effects of improvisational music therapy on joint attention behaviors in autistic children: A randomized controlled study. *Journal of Autism and Developmental Disorders*, 28, 1758-1766.
- 14) Orr, T. J., Myles, B. S., & Carlson, J. K. (1998). The impact of rhythmic entrainment on a person with autism. *Focus on Autism and Other Developmental Disabilities*, 13(3), 163-166.
- 15) Simpson, K. & Keen, D. (2010). Teaching young children with autism graphic symbols embedded within an interactive song. *Journal of Developmental Physical Disabilities*, 22, 165-177.
- 16) Stephens, C. E. (2008). Spontaneous imitation by children with autism during a repetitive musical play routine. , 12, 6 *Journal of Autism and Developmental Disorders* 45-675.

Further readings

- 1) Gottlieb, Robert S. 1993. *Solo Tabla Drumming of North India: Its Repertoire, Styles, and Performance Practices*. Delhi: Motilal Banarsidass.
- 2) Kippen, James. 1988. *The Tabla of Lucknow: A Cultural Analysis of a Musical Tradition*. Cambridge: Cambridge University Press.