



EFFECTIVENESS OF TRANSDISCIPLINARY APPROACH IN THE INTERVENTION OF CHILDREN WITH AUTISM A CASE STUDY

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ABSTRACT

The aim of present study is to find out the effectiveness of trans-disciplinary approach in management of children with autism. Trans-disciplinary approach is an approach where in all related professionals along with case manager, child and family is involved in the process of assessment and intervention.. The comprehensive intervention programme is implemented by the case manger with the support of parents and under the guidance of professionals. This trans-disciplinary approach helps the family to understand the intervention process more precisely. In the current study, the index child has been provided a 3 months intervention under trans-disciplinary approach. Analysis of pre and post scores in selected assessment tools reported significant improvement in developmental domains of the child. This approach has also been

contributing for enhanced involvement of parents in planning and implementation of intervention process. The current study concludes that trans-disciplinary approach, is effective for children with autism especially in Indian conditions.

Key words :- Trans-disciplinary , intervention , autism spectrum disorder.

INTRODUCTION

Autism spectrum disorder (ASD) is a major developmental disability which can cause wide range of challenges in social interaction, communication, and behavior. As per The *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)* ASD is characterized by persistent impairments in social interaction and restricted, repetitive patterns of behaviors, interests, or activities. The term Autism, or autism spectrum disorder (ASD), the name adopted in 2013, replaces the earlier terms such as autistic disorder, Asperger's syndrome and other conditions envisioned on the continuum of autism. It is estimated that worldwide about one in 100 children has autism.. India which is a populous country of nearly 1.3 billion people with children ≤ 15 years constituting nearly one-third of the population, has been estimated that more than 2 million people might be affected with ASD in India. Boys are likely to be diagnosed with autism, four times more than girls. Symptoms of autism can appear as early as 2 years of age and they can diagnosed reliably by age 2, in some cases even earlier by 18 months of age. One of the most commonest condition that co occurs with Autism is intellectual disability with 31% of children with ASD having intelligence quotient [IQ] < 70 , 25% in the borderline range IQ 71–85, and 44% have IQ scores in the average to above average range IQ > 85 .. Research shows that intervention right from the early years of life leads to positive outcomes later in life for people with autism.

APPROACHES IN INTERVENTIONS

In the early beginnings of 1950s, intervention for children with ASD was predominantly based on psychodynamic theories. Ever since there has been a paradigm shift in the intervention approaches for autism. Till 1980s, most children with Autism Spectrum Disorder didn't attend school, rather they were simply rejected or institutionalized. Later on, specialized curriculum known as Individualized Education Program (IEP) had been developed for these children by the Special Needs Education Program. This IEP is a model that has been initiated in United States, in accordance with the Individuals with Disabilities Education Act (IDEA), a law from 2004 which is intended to protect children with disabilities and ensure them an equal and effective education (IDEA, 2004) and has been presently practiced in all countries worldwide, with the required variations.

According to the mode of delivery, intervention programs for autism has been classified as Center-based, Home-based and School-based programs and as per the age of the target children, it has been divided as Early Intervention programs (until 3-4 years, depending on the country)- School age programs. and Adult age programs. Each model focuses on some or all of the aspects related to ASD and attempts to improve social skills, communication skills and decrease maladaptive behaviors. Irrespective of the type, most of Interventions for children in autism are commonly delivered using Inter disciplinary, Trans disciplinary & Multi-disciplinary approaches with each having its own advantages and disadvantages.

THE MULTIDISCIPLINARY APPROACH-

Multidisciplinary approach involves a MDT team, comprising of individuals from various disciplines, who use their unique professional expertise to develop an intervention plan for those with complex care needs. These professionals utilize their knowledge and skills and make a combined effort in planning, managing, and coordinating of interventions, with the focus mainly on providing a foundation for independence and inclusion. They work proactively to provide intervention services at home or in the community, thereby avoiding or minimizing unnecessary hospital services.

INTERDISCIPLINARY APPROACH

Interdisciplinary approach is a process wherein professionals from different but related disciplines work together to assess and manage the challenges by proactive participation and mutual decision making. Team members share information within themselves but independently implement their section of the plan.

TRANSDISCIPLINARY APPROACH- In the transdisciplinary approach, each professional provides a management plan to the case manager in consultation with the other team members. One of the members may be elected as a case manager who will deal with the child. The case manager will be a trained rehabilitation professional.

A Transdisciplinary model of practice provides family-centered, integrated and well synchronized services to meet the complex needs of children with disabilities and their families (Carpenter, 2005). The transdisciplinary approach (TA) has been recognized as one of the best practice for early intervention (Bruder, 2000; Guralnick, 2001), and many early intervention programs adopt some or other forms of transdisciplinary approach (Berman, Miller, Rosen, & Bicchieri, 2000). In contrast to other service delivery approaches, transdisciplinary approach is considered to minimize service fragmentation, decrease the likelihood of conflicting and confusing reports and communications with as well as within families, and enhance service coordination (Carpenter, 2005; Davies, 2007). Transdisciplinary service comprises of role sharing among varied disciplines so as to maximize communication, interaction, and cooperation among team members (Davies, 2007; Johnson et al., 1994). The transdisciplinary team is characterized by the commitment of its members to share expertise, learn from each other, and work together to implement synchronized services (Fewell, 1983; Peterson, 1987; United Cerebral Palsy National Collaborative Infant Project, 1976). A key outcome of transdisciplinary approach is the development of a mutual vision or “shared meaning” among the team (Davies, 2007; McGonigel, Woodruff, & Roszmann-Millican, 1994), with the family being the significant member of the team.

Team Around the Child” (Davies, 2007), a family-centered, transdisciplinary model of early intervention service delivery, which was based on the works by Limbrick (2005) in the United Kingdom outlines 10 model components, including philosophy, family role, key worker role, team interaction, lines of communication, staff

development, and the assessment process. Such descriptions of practice models contribute a lot in translating the rhetoric of TA into reality.

Transdisciplinary teams work together, sharing teams' skills and goals which are formulated for better short and long-term positive outcomes. The benefits include team members around the Children use strategies and approaches from all different disciplines. Team members develop greater awareness and understanding of different disciplines through sharing of information and best practice and even learn theories and methods from different disciplines. The human and material resources for successful implementation of transdisciplinary model may be of higher end, but the potential payoffs for children, their, families, and professionals as well as development of their expertise are worth investing. (King et al. 2009)

NEED OF THE STUDY

Review of literature revealed that interventions for autism have a multifaceted approach ranging from home based to multidisciplinary. Since autism is a neurodevelopmental disorder and early diagnosis is possible as early as 18 months, comprehensive early interventions involving occupational therapist, psychologist, speech pathologist, special educator, pediatric and neuro psychiatrist can be very effective. However the service delivery models varies from multidisciplinary to interdisciplinary to transdisciplinary approach with each having its own pros and cons. Most of the researches have reported that intervention for autism spectrum disorder is implemented predominantly in multidisciplinary model. However it was felt that in the given situation, especially in a country like India, where there is still acute scarcity for resources, more so on the rural belts, the trans disciplinary service delivery model can be an effective alternate. . This approach is holistic in nature and an integrated one where the case manager acts as connecting link among the child, its parents and the field experts. Making the intervention easily comprehensible and following up with a case manager might help to track the progress of the child in a better way. It also reduces the burden from the parents shoulder to search for different professions to cater to their child's need. All is under one roof and is single handed by a case manger. Much has been written about the conceptual basis of TA, including its premises and elements, but information is limited about transdisciplinary service delivery especially for children with autism from a practitioner's perspective in Indian conditions.

The current paper, through a single-subject case study, presents and discusses how a comprehensive transdisciplinary approach has guided assessment and formulation of a comprehensive and individualized intervention plan for an autistic child, which has been implemented consistently over a period of 3 months in a rehabilitation setting. The effects on the improvement levels, its success rate, experiences gained and the lesson learnt are presented and discussed which will have contributive value to future research and evidence-based practices.

METHODS

Background of the index child :

The initials of the young person at the centre of this study have been changed to maintain confidentiality. HS is a 4 year 7 month male child diagnosed as Mild Autism with Low Average Intellectual Functioning who is presently living with his parent in nuclear family system. His mother tongue is Bengali with his mother being an house wife with graduation and father a business man with H.Sc Qualification. They are currently residing at a rural village at west Bengal. His presenting complaints were Self taking, laughs irrelevantly,, poor eye contact, hyperactive and restlessness,

Pre Natal-history revealed that the child was conceived by the mother at the age of 21. Antenatal check-ups were done regularly. Natal history indicated post term normal delivery at hospital after 7 days of due date with a birth weight of 3.62 kg . The birth cry was immediate and birth colour was normal. Post Natal history revealed seizure at the age of 4days and neonatal jaundice for which the child was incubated for .. days. Regular Immunization was done and no other significant medial history been reported. No other mental illness, neurodevelopmental disorders or epilepsy or any other disability reported in the family.

Motor milestones of Mr HS are achieved more or less within time and his language milestones were mildly delayed. His first words were by 10 months and sentences around 4 years. His ADL milestones were achieved within normal ranges. He is presently in both special as well as regular school system and has been reported with the behavioural issues of pushing and spitting on others, fear of height and noise, inadequate social relationships and not able to maintain personal boundaries. He can follow only simple instructions.

Academically HS is capable of reciting rhymes, alphabets from a-z and numericals from 1-10. He can read numbers from 1-30, scribble and he can join of dots & copy alphabets/numbers. Socially he exhibits social smile, plays with others and can say tata-bye.

Psychological assessment of HS reported his socio-adaptive functioning at 83 and his score of 74 on ISAA reported that the child is of low average intellectual functioning with mild autism

Assessment

In addition to gathering detailed information about HS's abilities and difficulties, a series of observations were carried out with HS in a varied range of environments to ascertain his current needs and strengths. As part of the assessment process, data was compiled from different assessment tools from a range of professionals (Table 1)

(A) Portage Guide'- S.M. Bluma, M. Shearer, A.H. Frohman & Jean

Description- This tool is for 0-6 years children and it is a home based training system in which parents can be involved directly. This checklist covers areas such as infant development, self-help, motor, cognitive, language and socialization. In each area, the activity card for each skill which explains the material and the procedure will be used to train the child.

(B) Behavioural Assessment scale for Indian Children with Mental Retardation (BASIC-MR PART-B):-

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BASIC-MR PART-B (Behavioural Assessment scale for Indian Children with Mental Retardation). This scale is designed to elicit systematic information on the current level of behaviours in school aged children with intellectual disability. The BASIC-MR., Part B, has seventy-five items under ten domains:- 1. Violent and destructive behaviours, 2. Temper tantrums, 3. Misbehaves with others, 4. Self injuries behaviours, 5. Repetitive behaviours, 6. Odd behaviours, 7. Hyperactive behaviours, 8. Rebellious behaviours, 9. Antisocial behaviours and 10. Fears

(C) Short Sensory Profile:-Winnie Dunn

This profile is use for children with sensory issues / the children's need occupational therapy. This profile is consists with 38 items under this 7 domains: - 1)Tactile sensitivity, 2)Taste / smell sensitivity 3)Movement sensitivity 4)Under responsive / Seeks sensation 5)Auditory filtering 6)Low energy / week and 7)Visual / Auditory Sensitivity.

Scoring system - Always (1), Frequently (2), Occasionally (3), Seldom (4), Never (5)

(d) Receptive Expressive Emergent Language Test;- The REEL is a checklist that uses observational information reported by parents or guardians to assess speech and language ability. This tool helps to identify the receptive and expressive language problems in children up to 3 years old and also to determine the impact of physical and/or environmental risks that lead to delays in early speech and language development. The checklist is used to screen for at-risk children, describe the present developmental status of young children and to support in planning intervention goals.

Management :

Based on observations, the findings from the assessments and working in partnership with HS & his mother, the case manager identified the following goals as priority areas for the intervention.

1. **Maintaining eye contact and social communication**
2. **Addressing behavioral difficulties which are impacting on family life and future prospects**
3. **Preparing HS to engage appropriately in social situations**
4. **Teaching HS functional life skills**

Treatment

The intervention plan for HS included **social stains, modeling, sensor motor stimulation, speech stimulation** which were delivery based on transdisciplinary model . **HS** was provided with regular intervention for three months both in centre and home based model. Regular follow up and needful modifications in the iintervention programme in consultation with the stake holders has been taken up continuously. After three months, HS was reassessed and the levels of improvement and gains in various domains were tabulated.

RESULTS

Table1:

S.NO	DOMAINS	TOTAL SCORE	BASELINE	1ST TERM	GAIN
1	Infant Development	45	39 (84.8%)	46 100%)	7 (15.2 %)
2	Socialization	83	28 (33.8%)	70 (84.3 %)	42 (50.6%)
3	Language	99	43 (43.4%)	56 (56.6%)	13 (13.1%)
4	Self Help	105	37 (35.2%)	50 (47.6%)	13 (12.3%)
5	Cognition	108	45 (41.7%)	80 (74.,1%)	35 (32.4%)
6		108	76 (70.4%)	108 100%	32 29.6%
7	Total	548	268 (48.9%)	410 (74.8)	142 (25.9)

Figure -1

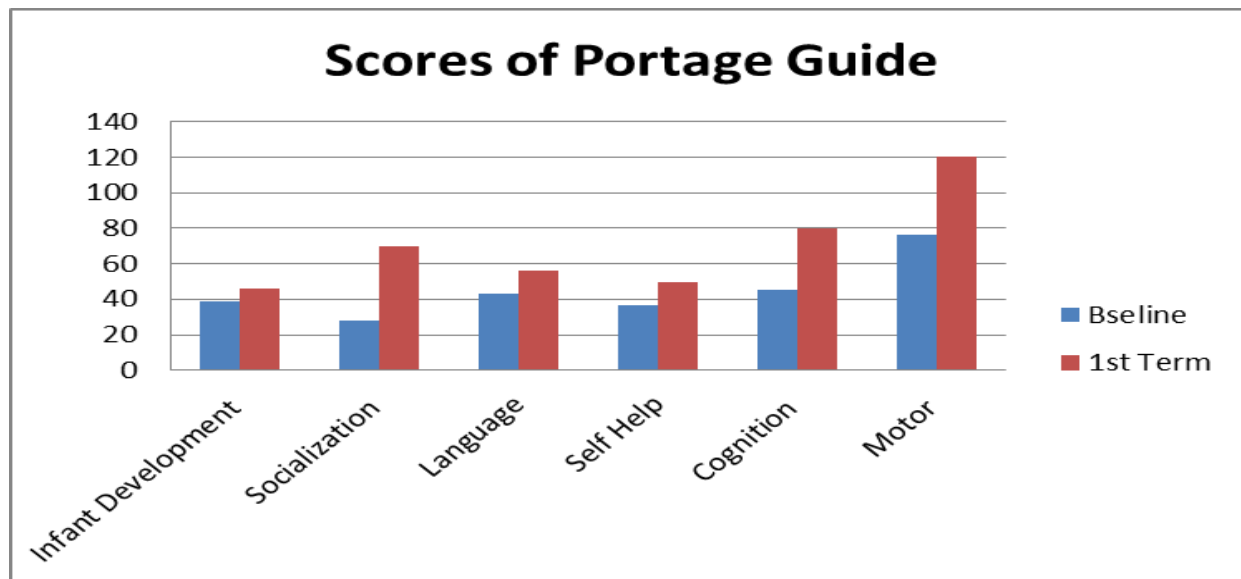


Table 1 & Figure 1 indicate that H.S had highest skills in infant development area (84.8%) and lowest skills in socialisation area (33.8%). After 3 months of intervention HS had attained maximum skills(100%) in infant development & Motor area and least skills in self help area(47.6%). Pre-post comparison indicate highest gains in the socialisation area (45%) and second least gains in Language (13%), self help (13%) and least gains in infant development (7%). Over all HS had 268 (48.9%) of comprehensive development at baseline and 410 (74.8%) at 1st term, gaining 142 (25.9%).

Table: 2

SL.NO.	DOMAINS	TOTAL SCORE	BASELINE	1 ST QUARTER	DIFFERENCE
1	Antisocial behaviours	32	16 50%	16 18.75%	-10 31.25%
2	Temper tantrums	8	6 75%	2 25%	-4 50%
3	Misbehaves with others	14	5 35.7%	3 21.4%	-2 14.3%
4	Self-injuries behaviours	20	3 15%	1 5%	-2 10%
5	Repetitive behaviours	16	7 43.75%	5 31.25%	-2 12.5%
6	Odd behaviours	16	5 31.25%	4 25%4	-1 6.25%
7	Hyperactive behaviours	6	6 100%	0 0%	-6 100%
8	Rebellious behaviours	12	4 33.3%	1 8.3%	-3 25%
9	Antisocial behaviours	18	0	0	0
10	Fears	8	2 25%	2 25%	0 0%
11	Total	150	54 36%	34 22.7%	20 13.3%

Figure:2

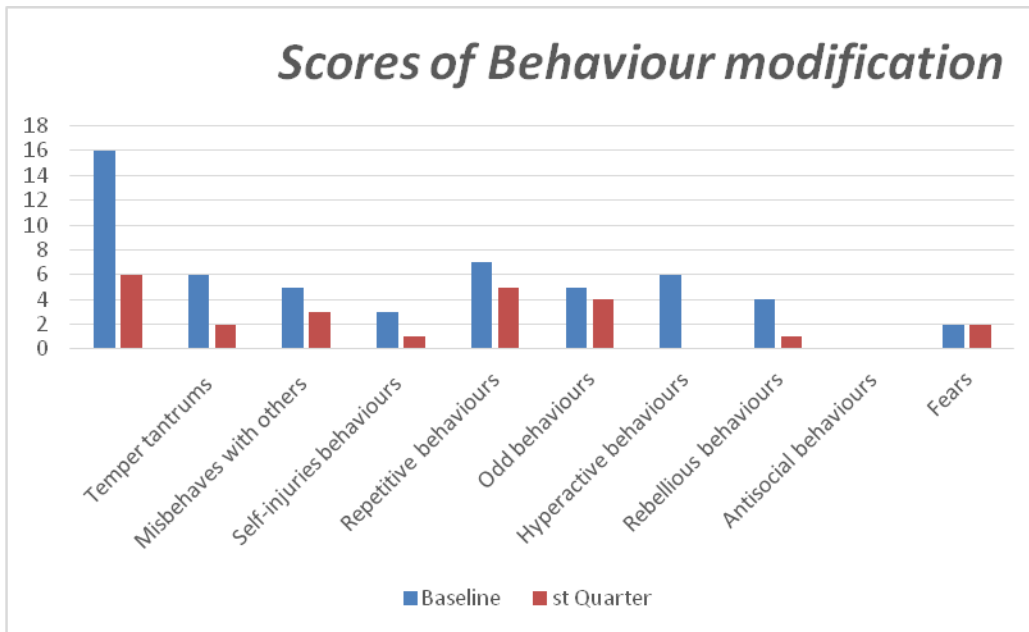


Table 2 & Figure 2 indicate that H.S had hyperactivity as the major problem behaviour (100%) and odd behaviour (31.25%) and antisocial behaviour (0%) as the least problem behaviour. After 3 months of intervention, the scores indicate repetitive behaviour (31.25%) and hyperactivity (0%) as the major and least problem behaviours respectively. Comparison of Pre and post scores indicate that HS has attained maximum gains in hyperactivity domain (100%) , second least gains in odd behavioural domain(6.25%) and no gain in fears domain(0%). Comprehensively HS had 132(36%) of behavioural issues at baseline and 143 (22.7%) at 1st term, losing 11(13.3%) over all.

Table 3

S.NO	DOMAIN	CHRONOLOGICAL AGE	BASE LINE	1ST QUARTER	GAIN
1	Receptive Language Skill	55	27-30 months (28.5m & 51.9%)	30-32months (31m & 56.4%)	2.5 4.5%
2	Expressive Language skill	55	27-30 months (28.5m & 51.9%)	30-32months (31m & 56.4%)	2.5 4.5%
3	Comprehension	55	24-26 months (25m & 45.5%)	26-28months (27m & 49.1%)	2 3.6%
4	Expression-	55	24-26 months (25m & 45.5%)	26-28months (27m & 49.1%)	2 3.6%
5	Cognition	55	24-26 months (25m & 45.5%)	26-28months (27m & 49.1%)	2 3.6%
8	Total	275	132 48%	143 (52%)	11 (4%)

Figure 3

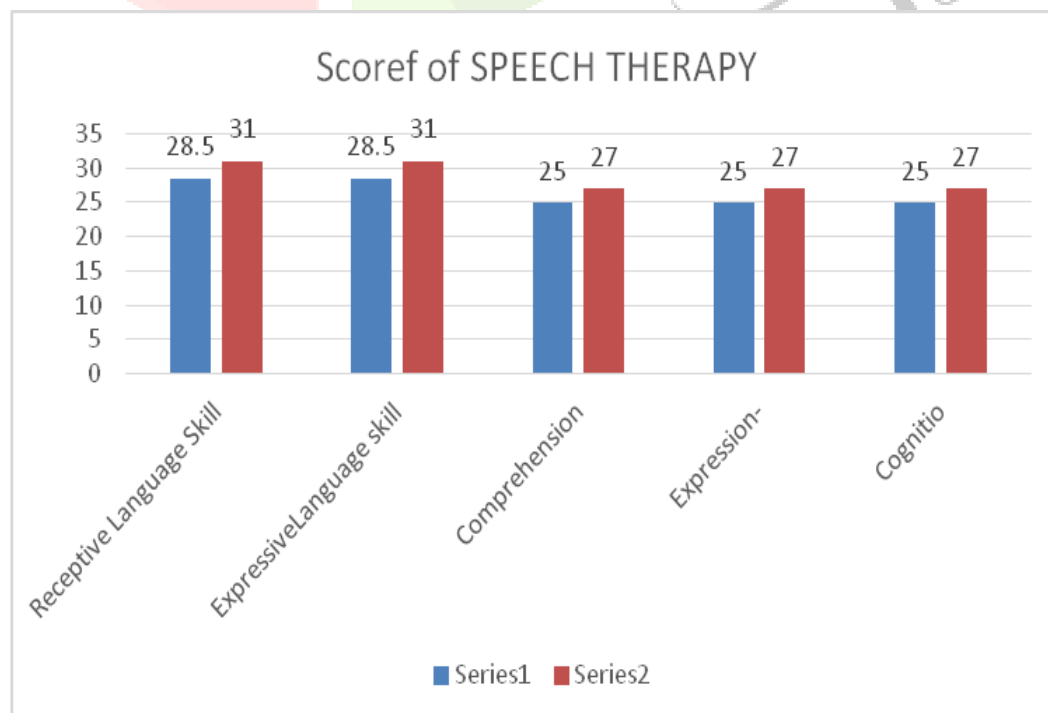


Table 3 & Figure 3 indicate that H.S had high skills in receptive and expressive language development area (28.5m & 51.9%) and lowest skills in comprehension, expression & Cognition areas (25%). After 3 months of intervention HS had attained highest skills(31m & 56.4%) in receptive and expressive language development areas and least skills in comprehension, expression & Cognition areas (27m & 49.1%). Comparison of Pre-post scores indicate highest gains in the receptive and expressive language development (2.5m & 4.5 %) and least gains in comprehension, expression & Cognition areas(2m & 3.6%). Over all HS had 132m (48%) of Comprehensive speech and language development at baseline and 143m(52%) at 1st term, gaining 11m(4%).

OCCUPATIONAL THERAPY

Table 4

S.NO	DOMAIN	TOTAL SCORE	BASELINE	1 ST QUARTER	GAIN
1	Tactile Sensitivity	35	30 85.7%	34 97.1%	4 11.4%
2	Taste & smell sensitivity	20	20 100%	20 100%	0
3	Movement sensitivity	15	11 73.3%	13 86.6%	2 13.3%
4	Seek sensation	35	20 57.2%	24 68.6%	4 11.4%
5	Auditory filtering	30	16 53.4%	26 86.7%	10 33.3%
6	Low energy/week	30	30 100%	30 100%	0
7	Visual/auditory sensitivity	25	19 76%	22 88%	3 12%
	Over all sensory processing	190	146 76.8%	169 88.9%	23 12.1%

Figure-4

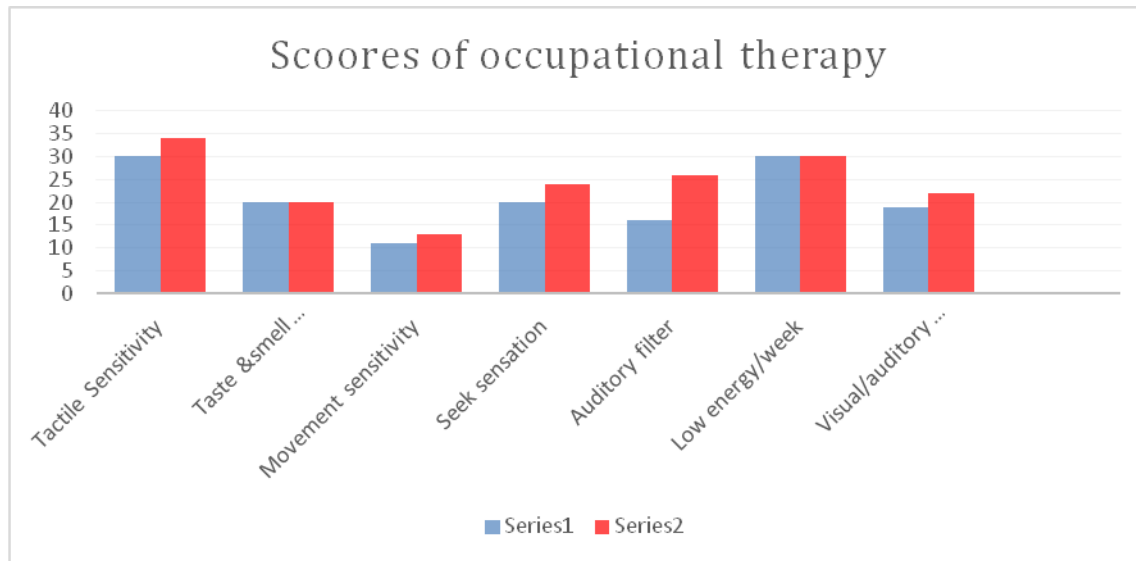


Table 4 and figure 4 indicate that H.S had normal sensory processing in tactile and energy (Proprioceptive) areas, followed by tactile (85.7%) and least sensory processing in auditory filtering (53.4%). After 3 months of intervention HS had attained highest sensory processing abilities in tactile sensitivity (97.1%) and lowest in sensory seeking (68.6%). Comparison of Pre-post scores indicate highest gains in the auditory filtering (33.3 %) and least gains in sensory seeking and tactile sensitivity (11.4%). Over all HS had 146 (76.8%) of sensory processing abilities at baseline and 169(88.9%) at 1st term, gaining 23(12.1%).

DISCUSSION

The current study developed a comprehensive intervention plan for a child with autism after initial assessment of the child's development. The intervention addressed all the challenge areas of the child and the intervention was implemented based on transdisciplinary approach for a period of 3 months. Reassessments were taken up after 3 months to measure the level of improvement the child has attained. The pre and post scores in the Portage Guide which assesses reported considerable improvement in all the areas with major improvement in socialisation (50.7%) and least improvement in language (13%) as well as self help skills(13%). This can be attributed to the fact that in transdisciplinary approach, as the parents are coordinating with the case manager as a single contact point, it helps them to understand the challenges of the child as well the intervention goals and

methods in a better manner. This contributes for a well informed approach and active involvement from the parents. Further as the child belongs to joint family system, the support of the extended family members could have been greater strength in the intervention process. This finding is supported by the study conducted by ranjan et al (2014) which has reported that under transdisciplinary approach based group therapy, children showed improvement in social-communication with their peers, showed interest to participate, initiated and took turns in storytelling, various art and craft activities, there by concluding that transdisciplinary approach is a useful treatment strategy.

The pre and post scores in the BASAL MR indicates that hyperactivity levels of the index child has reduced to the maximum (100%), with marginal reduction in odd behaviours (6.25%) and no changes in fearful behaviours. The index child also reported good improvement in the auditory filtering abilities (33.3%) and least improvement in tactile & sensory seeking behavior. Considerable gains have been reported in the receptive and expressive domain of communication(2.5%). Auditory Sensory processing issues tend to impact the child's language development on both receptive and expressive areas. The auditory processing issues along with language difficulties lead to impaired socialization and socially maladaptive behaviours such as restlessness and hyperactivity. Similar findings were reported by Jim Stevenson et al(2010) that behaviour problems are found more commonly in children with hearing loss and behaviour problems are highest amongst those children with hearing loss with the under developed language capabilities.

The current study reports the on the basis of transdisciplinary approach base intervention over a period of 3 months, the index child had significant improvements in the auditory filtering abilities of the child, enhanced language development, social satisfying relationships, thus in turn reducing the frustrations within the child there by reducing restless and hyperactive behavior. Hyperactivity is one of the major challenges a child with Autism face in their life time and it has greater impact on other life such as ADL, academics and vocation. The improvement showed by the index child in all the identified areas signifies the holistic effect of transdisciplinary approach based intervention.

Similar findings were reported by Irina Rangolia (2018) who through her single case study reported progress in the areas of: independence, confidence and attitude to learning, social skills and relationship, positive behavior support and ability to make choices. She further reported that the progress in the above areas in turn provided the foundations for active engagement, enjoyment and ultimately well-being of the child which were also reflected in different academic areas.

The present study signifies that the transdisciplinary model with its fundamental beliefs that the development of the children must be viewed as integrated and interactive and children must be served within the context of the family, can go a long way in defining the successful implementation of disability rehabilitation services especially in developing countries. Being holistic in nature, this approach contributes for better case management, better resource management (Time, Money) and ensures greater Coverage of Services. This approach needs minimal of professionals required and it is more applicable and useful for a country like India where there is severe dearth of professionals especially in the rural areas.

This approach promotes shared understanding of the issue, where in different views had been explored, explained, understood and challenged in the light of deeper knowledge of the individual and his needs. A person centered approach has been promoted and adopted, where the context in which issues constituted barriers to his development are explored, understood together understood and an agreement on approaches adopted was reached through a positive collaboration. This process required a very delicate balance between the ability to respect the professional expertise of everyone and yet create a common shared vision of the short and long term desirable outcomes. This approach also promotes working in partnership with all involved, which was also significant key to success of the above model. Establishing and nurturing a positive working relationship with family, where expertise was shared through evidence-based practice rather than opinions, was a long but essential process. Regular focused meetings with external agencies/professionals along with parents, organised by the case manager provides an opportunity to work collaboratively - rather than in isolation - and more significantly holistically and consistently across different contexts. Another defining feature and most crucial component in transdisciplinary team development is the role release. . The team members have to give up or “release” intervention strategies from their disciplines, for getting implemented under the supervision and

support of the case managers- the service delivery team whose disciplines are accountable for those practices. The role release process therefore involves sharing of expertise, valuing the perspectives, knowledge, and skills of those from other disciplines; and trust—being able to “let go” of one’s specific role when appropriate. Role release also occurs with respect to the family where parents can be educated about appropriate activities to incorporate into daily routines. This role release is very much challenging and needs to be prioritized to make the model consistently successful.

CONCLUSION

Early intervention & disability rehabilitation services are still being at the rudimentary stage in our country, there is a need to strengthen service delivery models for persons with disabilities especially in the rural areas. The available services and resources in the urban areas, though falling short of matching the needs of urban population, are hardly percolating to the level of rural population..There is a severe dearth resources in majority areas of our country and in such scenario Transdisciplinary approach which involves case managers parents and professionals from several disciplines, is one of the most viable option. This approach attempts to overcome the limitations of individual disciplines and forms a team that cuts across the disciplinary boundaries, thereby maximizing the communication, interaction and cooperation among the team members. The current study, through a single case study on a child with Autism, had signified the effectiveness of the transdisciplinary approach which employs a range of evidenced based practices to customize a client centered intervention programme, in the field of disability rehabilitation. The study further highlights that this TA model accommodates the needs of the individual with autism, promotes positive collaboration among professionals, well informed and family supported care programme and active coordination & service delivery by the case manager. For the purpose of ensuring better success rates in transdisciplinary model, practitioners who are offering interventions for children during the critical periods of development in this model, should be aware and consider utilizing wide range of interventions that best suit the needs of the children. The case manager, who is at the delivery end of this model, should be well equipped with the basics of all interventions and to be trained adequately to implement the interventions programme without creating confusion or hassles to the parents or child. This calls for more dedicated training programmes, carefully designed and developed with appropriate

entry level qualifications, course modules, evaluation methods, certifications process, training materials, human resources and infrastructure

This case study provides research evidence to support the application of a transdisciplinary approach for future practice. Despite the positive results and perceived benefits of the transdisciplinary approach used, the results should be considered within the context of response bias and a degree of subjectivity. More studies with robust research designs, longitudinal in nature and with larger sample size can be planned to strengthen the findings and improve its generalization value.

The study concludes that transdisciplinary approach which promotes working jointly together from the start, enriching the understanding of each individual's needs through a strength-based approach and providing opportunities for a continuing learning environment, seems one of the best way forward. Further evidence-based practices and single-case studies could continue to be a valuable contribution to the existing body of knowledge in autism practices.

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